SEMS-RM DOCID # 100029643

National Aeronautics and Space Administration

PER- AND POLYFLUOROALKYL SUBSTANCES SITE INSPECTION REPORT FOR AMES RESEARCH CENTER

Prepared for:
National Aeronautics and Space Administration
Headquarters
Washington, DC 20546

Prepared by:
Tetra Tech, Inc.
661 Andersen Drive
Pittsburgh, PA 15220
(412) 921-7090

August 2022

Draft

PER- AND POLYFLUOROALKYL SUBSTANCES
SITE INSPECTION REPORT
FOR
AMES RESEARCH CENTER

Draft

Prepared for:
National Aeronautics and Space Administration
Headquarters
Washington, DC 20546

Prepared by:
Tetra Tech, Inc.
661 Andersen Drive
Pittsburgh, PA 15220

Prepared by:

Kevin Bricknell, P.E.
Project Manager
Tetra Tech, Inc.

Approved by:

Mark Speranza
Program Manager
Tetra Tech, Inc.

August 2022

PROFESSIONAL ENGINEER CERTIFICATION

This Per- and Polyfluoroalkyl Substances Site Inspection Report for Ames Research Center in Mountain View, California, dated August 2022, has been prepared by or under the responsible supervision, direction, or control of the California-licensed Professional Engineer whose signature and seal appears below.



Kevin Bricknell
California P.E. License No. C 58829

TABLE OF CONTENTS

Section	Title	Page
PROFESSIONAL ENGINEER CERTIFICATION		**iii**
EXECUTIVE SUMMARY		**ES-1**
SECTION 1	**INTRODUCTION**	**1-1**
1.1	OBJECTIVES	1-1
1.2	REPORT ORGANIZATION	1-3
SECTION 2	**PFAS OVERVIEW**	**2-1**
2.1	PFAS BACKGROUND	2-1
2.2	PFAS HEALTH EFFECTS AND ADVISORY LEVELS	2-2
2.2.1	USEPA Health Based Values for PFAS	2-2
2.2.2	California Health-Based Values for PFAS	2-5
2.3	PFAS SCREENING LEVELS AND DATA EVALUATION	2-6
SECTION 3	**FACILITY BACKGROUND AND HISTORY**	**3-1**
3.1	PHYSICAL SETTING	3-1
3.2	FACILITY HISTORY	3-1
3.3	RESTORATION PROGRAM AT ARC	3-2
3.3.1	Navy Installation Restoration Sites	3-3
3.3.2	Middlefield-Ellis-Whisman Regional Plume	3-4
3.3.3	Orion Park Plume	3-5
3.3.4	EATS Plume	3-5
3.4	GEOLOGIC AND HYDROGEOLOGIC SETTING	3-6
3.5	HYDROLOGICAL SETTING	3-7
3.5.1	Groundwater	3-7
3.5.2	Stormwater	3-9
3.6	AOPCs AND ASSOCIATED FACILITIES DESCRIPTIONS	3-9
3.6.1	AOPC 1 – Former Firefighting Training Area (IR 10, 12, 20)	3-10
3.6.2	AOPC 2 – Crash Site (Sunnyvale Golf Course)	3-12
3.6.3	AOPC 3 – Hangars 2 and 3 (IR 7)	3-12
3.6.4	AOPC 4 – Former Engine Test Stand Area (IR 11)	3-13
3.6.5	AOPC 5 – Hangar N211 (within AOI 3, formerly AOI 12)	3-13
3.6.6	AOPC 6 – Hangar N248 (AOI 3 East)	3-14
3.6.7	AOPC 7 – Fire Department (Building 580)	3-15
3.6.8	AOPC 8 – Site 1 Runway Landfill (IR 1)	3-16
3.6.9	AOPC 9 – Site 2 Former Golf Course Landfill (IR 2)	3-17

TABLE OF CONTENTS (CONTINUED)

Section	Title	Page
3.6.10	AOPC 10 – Site 22 Landfill (IR 22)	3-17
3.6.11	AOPC 11 – Building 191 Pump Station	3-18
3.6.12	AOPC 12 – Stormwater Settling Basin/Eastern Diked Marsh (within IR 25)	3-19
3.6.13	AOPC 13 – NASA Groundwater Extraction Treatment System	3-19
3.6.14	AOPC 14 – Middlefield-Ellis-Whisman Groundwater Extraction Treatment System	3-20
3.6.15	AOPC 15 – West-Side Aquifers Treatment System (IR 28)	3-20
3.6.16	AOPC 16 – North Patrol Road Ditch (IR 21) and Northern Channel (IR 27)	3-21
3.6.17	AOPC 17 – Marriage Road Ditch (IR 3)	3-22
3.6.18	AOPC 18 – Lindbergh Avenue Storm Drain Ditch (AOI 6)	3-23
3.6.19	AOPC 19 – Stormwater Retention Pond (within IR 25)	3-23
3.6.20	AOPC 20 – Building N271 Industrial Wastewater Pretreatment Plant	3-24
3.6.21	AOPC 21 – Former Industrial Wastewater Surface Impoundments (IR 4)	3-24
3.6.22	AOPC 22 – Building N249 Outdoor Aerodynamic Research Facility	3-25
3.6.23	AOPC 23 – Hangar 4 (CANG) Building 662	3-25
3.6.24	AOPC 24 – Middlefield-Ellis-Whisman Plume	3-27
3.6.25	AOPC 25 – Orion Park Plume	3-28
3.6.26	AOPC 26 – Eastern Boundary (IR 5)	3-29
3.7	CONCEPTUAL SITE MODEL	3-30
3.7.1	Site Sources of PFAS	3-31
3.7.2	Transportation and Migration Pathways	3-32
3.7.3	Exposure Routes	3-32
3.7.4	Potential Receptors	3-34
SECTION 4	**FIELD ACTIVITIES**	**4-1**
4.1	MONITORING WELL INSTALLATION	4-2
4.2	SOIL SAMPLING	4-3
4.3	GROUNDWATER SAMPLING	4-3
4.4	SURFACE WATER SAMPLING	4-4
4.5	INFLUENT/EFFLUENT SAMPLES	4-5
4.6	INVESTIGATION-DERIVED WASTE MANAGEMENT	4-5
4.7	FIELD TASK MODIFICATIONS	4-5
SECTION 5	**ANALYTICAL RESULTS AND FINDINGS**	**5-1**
5.1	AOPC 1 – FORMER FIREFIGHTING TRAINING AREA (IR 10, 12, 20)	5-1
5.2	AOPC 2 – CRASH SITE (SUNNYVALE GOLF COURSE)	5-3

TABLE OF CONTENTS (CONTINUED)

Section	Title	Page
5.3	AOPC 3 – HANGARS 2 AND 3 (IR 7)	5-4
5.4	AOPC 4 – FORMER ENGINE TEST STAND AREA (IR 11)	5-5
5.5	AOPC 5 – HANGAR N211 (WITHIN AOI 3, FORMERLY AOI 12)	5-6
5.6	AOPC 6 – HANGAR N248 (WITHIN AOI 3)	5-7
5.7	AOPC 7 – FIRE DEPARTMENT (BUILDING 580)	5-8
5.8	AOPC 8 – SITE 1 RUNWAY LANDFILL (IR 1)	5-9
5.9	AOPC 9 – SITE 2 FORMER GOLF COURSE LANDFILL (IR 2)	5-9
5.10	AOPC 10 – SITE 22 LANDFILL (IR 22)	5-10
5.11	AOPC 11 – BUILDING 191 PUMP STATION	5-11
5.12	AOPC 12 – STORMWATER SETTLING BASIN/EASTERN DIKED MARSH (WITHIN IR 25)	5-11
5.13	AOPC 13 – NASA GROUNDWATER EXTRACTION TREATMENT SYSTEM	5-11
5.14	AOPC 14 – MIDDLEFIELD-ELLIS-WHISMAN GROUNDWATER EXTRACTION TREATMENT SYSTEM	5-12
5.15	AOPC 15 – WEST-SIDE AQUIFERS TREATMENT SYSTEM (IR 28)	5-13
5.16	AOPC 16 – NORTH PATROL ROAD DITCH (IR 21) AND NORTHERN CHANNEL (IR 27)	5-14
5.17	AOPC 17 – MARRIAGE ROAD DITCH (IR 3)	5-14
5.18	AOPC 18 – LINDBERGH AVENUE STORM DRAIN DITCH (AOI 6)	5-15
5.19	AOPC 19 – STORMWATER RETENTION POND (WITHIN IR 25)	5-16
5.20	AOPC 20 – BUILDING N271 INDUSTRIAL WASTEWATER PRETREATMENT PLANT	5-16
5.21	AOPC 21 – FORMER INDUSTRIAL WASTEWATER SURFACE IMPOUNDMENTS (IR 4)	5-16
5.22	AOPC 22 – BUILDING N249 OUTDOOR AERODYNAMIC RESEARCH FACILITY	5-17
5.23	AOPC 23 – HANGAR 4 (CANG) BUILDING 662	5-18
5.24	AOPC 24 – MIDDLEFIELD-ELLIS-WHISMAN PLUME	5-18
5.25	AOPC 25 – ORION PARK PLUME	5-19
5.26	AOPC 26 – EASTERN BOUNDARY (IR 5)	5-19
5.27	FIELD QA/QC SAMPLES	5-21
SECTION 6	**CONCLUSIONS AND RECOMMENDATIONS**	**6-1**
6.1	AOPC 1 – FORMER FIREFIGHTING TRAINING AREA (IR 10, 12, 20)	6-2
6.2	AOPC 2 – CRASH SITE (SUNNYVALE GOLF COURSE)	6-3
6.3	AOPC 3 – HANGARS 2 AND 3 (IR 7)	6-4
6.4	AOPC 4 – FORMER ENGINE TEST STAND AREA (IR 11)	6-4

TABLE OF CONTENTS (CONTINUED)

Section	Title	Page
6.5	AOPC 5 – HANGAR N211 (WITHIN AOI 3, FORMERLY AOI 12)	6-5
6.6	AOPC 6 – HANGAR N248 (WITHIN AOI 3)	6-5
6.7	AOPC 7 – FIRE DEPARTMENT (BUILDING 580)	6-6
6.8	AOPC 8 – SITE 1 RUNWAY LANDFILL (IR 1)	6-7
6.9	AOPC 9 – SITE 2 FORMER GOLF COURSE LANDFILL (IR 2)	6-8
6.10	AOPC 10 – SITE 22 LANDFILL (IR 22)	6-8
6.11	AOPC 11 – BUILDING 191 PUMP STATION	6-9
6.12	AOPC 12 – STORMWATER SETTLING BASIN/EASTERN DIKED MARSH (WITHIN IR 25)	6-9
6.13	AOPC 13 – NASA GROUNDWATER EXTRACTION TREATMENT SYSTEM	6-10
6.14	AOPC 14 – MIDDLEFIELD-ELLIS-WHISMAN GROUNDWATER EXTRACTION TREATMENT SYSTEM	6-11
6.15	AOPC 15 – WEST-SIDE AQUIFERS TREATMENT SYSTEM (IR 28)	6-12
6.16	AOPC 16 – NORTH PATROL ROAD DITCH (IR 21) AND NORTHERN CHANNEL (IR 27)	6-12
6.17	AOPC 17 – MARRIAGE ROAD DITCH (IR 3)	6-13
6.18	AOPC 18 – LINDBERGH AVENUE STORM DRAIN DITCH (AOI 6)	6-13
6.19	AOPC 19 – STORMWATER RETENTION PONDS (WITHIN IR 25)	6-14
6.20	AOPC 20 – BUILDING N271 INDUSTRIAL WASTEWATER PRETREATMENT PLANT	6-14
6.21	AOPC 21 – FORMER INDUSTRIAL WASTEWATER SURFACE IMPOUNDMENT (IR 4)	6-15
6.22	AOPC 22 – BUILDING N249 OUTDOOR AERODYNAMIC RESEARCH FACILITY	6-16
6.23	AOPC 23 – HANGAR 4 (CANG) BUILDING 662	6-16
6.24	AOPC 24 – MIDDLEFIELD-ELLIS-WHISMAN (MEW) PLUME	6-17
6.25	AOPC 25 – ORION PARK PLUME	6-17
6.26	AOPC 26 – EASTERN BOUNDARY (IR 5)	6-18
6.27	PATH FORWARD	6-18
SECTION 7	**REFERENCES**	**7-1**

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

Table	Title	Page
Table 2-1	PFAS Screening Levels	2-11
Table 4-1	Soil Sample Location Summary	4-7
Table 4-2	Groundwater Monitoring Well Sample Location Summary	4-8
Table 4-3	Surface Water Sample Location Summary	4-10
Table 4-4	Influent/Effluent Sample Location Summary	4-11
Table 4-5	Monitoring Well Construction Details	4-12
Table 4-6	Water Level Measurements	4-13
Table 5-1	PFAS Soil Analytical Results	5-22
Table 5-2	PFAS Soil Frequencies of Detection	5-27
Table 5-3	PFAS Groundwater Analytical Results	5-29
Table 5-4	PFAS Groundwater Frequencies of Detection	5-42
Table 5-5	PFAS Surface Water Analytical Results	5-44
Table 5-6	PFAS Surface Water Frequencies of Detection	5-45
Table 5-7	PFAS Analytical Results for Water Treatment Systems	5-46
Table 5-8	Summary of QA/QC Sample Results	5-48
Table 6-1	Conclusions and Recommendations	6-20

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

Figure	Title	Page
Figure 1-1	Ames Research Center Location Map	1-5
Figure 1-2	Overview of Areas of Potential Concern	1-7
Figure 3-1	Site Topography	3-37
Figure 5-1	Soil Results – AOPC 1 Former Firefighting Trainging Area (IR 10, 12, 20), AOPC 6 (Hangar N211), and AOPC 7 (Fire Department, Building 580)	5-51
Figure 5-2	Soil PFAS Results at AOPC 2 Crash Site (Sunnyvale Golf Course)	5-53
Figure 5-3	Soil PFAS Results at AOPC 23 Hangar 4	5-55
Figure 5-4	Groundwater PFAAF Results at AOPC 1 Former Firefighting Trainging Area (IR 10, 12, 20), AOPC 6 (Hangar N211), and AOPC 7 (Fire Department, Building 580)	5-57
Figure 5-5	Groundwater PFAS Results at AOPC 2 Crash Site (Sunnyvale Golf Course) and AOPC 26 Eastern Boundary (IR 5)	5-59
Figure 5-6	Groundwater PFAS Results at AOPC 3 Hangars 2 & 3 (IR 7)	5-61
Figure 5-7	Groundwater PFAS Results at AOPC 4 Former Engine Test Stand Area (IR 11) and Surface Water Results at AOPC 11 Building 191 Pump Station	5-63
Figure 5-8	Groundwater PFAS Results at AOPC 5 Hangar N211 (within AOI 3 formerly AOI 12)	5-65
Figure 5-9	Groundwater PFAS Results at AOPC 8 Site 1 Runway Landfill (IR 1)	5-67
Figure 5-10	Groundwater PFAS Results at AOPC 9 Former Golf Course Landfill (IR 2), and AOPC 16 North Patrol Road Ditch (IR 21) / Northern Channel (IR 27)	5-69
Figure 5-11	Groundwater PFAS Results at AOPC 10 Site 22 Landfill (IR 22)	5-71
Figure 5-12	Groundwater and Surface Water PFAS Results at AOPC 17 Marriage Road Ditch (IR 3) and AOPC 21 Former Industrial Wastewater Surface Impoundment (IR 4)	5-73

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES (CONTINUED)

Figure	Title	Page
Figure 5-13	Groundwater PFAS Results at AOPC 18 Lindbergh Avenue Storm Drain Ditch (AOI ^) and AOPC 22 Building N249, Outdoor Aerodynamic Research Facility	5-75
Figure 5-14	Groundwater PFAS Results at AOPC 24 MEW Plume	5-77
Figure 5-15	Groundwater PFAS Results at AOPC 25 Orion Park Plume	5-79
Figure 5-16	Groundwater PFAS Results at AOPC 23 Hangar 4	5-81
Figure 5-17	Surface Water PFAS Results at AOPC 13 NASA Groundwater Extraction Treatment System, AOPC 14 MEW Groundwater Extraction Treatment System, and AOPC 20 Building N271 Industrial Wastewater Treatment Plant	5-83
Figure 5-18	Surface Water PFAS Results at AOPC 12 Stormwater Settling Basin/Eastern Diked Marsh (within IR 25), AOPC 15 West-side Aquifers Treatment System, and AOPC 19 Stormwater Retention Ponds (within IR 25)	5-85

LIST OF APPENDICES

APPENDIX A	SITE INSPECTION WORK PLAN
APPENDIX B	PREVIOUS PFAS SAMPLING RESULTS
APPENDIX C	PFAS SAMPLING STANDARD OPERATING PROCEDURE
APPENDIX D	FIELD DOCUMENTATION
APPENDIX E	PHOTOGRAPHIC LOG
APPENDIX F	WELL SURVEY INFORMATION
APPENDIX G	LABORATORY ANALYTICAL REPORTS
APPENDIX H	DATA VALIDATION REPORTS
APPENDIX I	STATISTICAL SUMMARY TABLES

ABBREVIATIONS AND ACRONYMS

µg/kg	Micrograms per kilogram
µg/L	Micrograms per liter
4:2	fluorotelomer sulfonate
6:2	fluorotelomer sulfonate
8:2	fluorotelomer sulfonate
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
AFFF	Aqueous film-forming foam
Air Force	United States Air Force
AOI	Area of Investigation
AOPC	Area of potential concern
ARC	Ames Research Center
AS/SVE	Air sparge and soil-vapor extraction
AST	Aboveground storage tank
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	Below ground surface
BNA	Base neutral acid
BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CANG	California Air National Guard
CAS	Chemical Abstracts Service
CDC	Centers for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of concern
COEC	Chemical of ecological concern
Cr^{6+}	Hexavalent chromium
CSM	Conceptual site model
CSWRCB	California State Water Resources Control Board
DDW	Division of Drinking Water
DoD	United States Department of Defense
EATS	East-Side Aquifers Treatment System
EDM	Eastern Diked Marsh
EDR	Environmental Data Resources, Inc.
ERT	Earth Resources Technology, Inc.
ESL	Environmental Screening Level

ABBREVIATIONS AND ACRONYMS (CONTINUED)

FFA	Federal Facility Agreement
FOSA	Perfluorooctane sulfonamide
FRB	Field reagent blank
FSS	Fire suppression system
ft	Feet or foot
FTS	Fluorotelomer sulfonic acid
GAC	Granulated activated carbon
gpm	Gallons per minute
GWETS	Groundwater Extraction Treatment System
HA	Health Advisory
HDPE	High-density polyethylene
HFPO-DA	Hexafluoropropylene oxide dimer acid
HQ	Hazard quotient
HTA	Heavier-than-air
IC	Institutional control
ID	Inner diameter
IDW	Investigation-derived waste
IR	Installation Restoration
IRACR	Interim Remedial Action Completion Report
IRIS	Integrated Risk Information System
ISSi/SAIC	Integrated Science Solutions, Inc./Science Applications International Corporation
ITRC	Interstate Technology Regulatory Council
IWPP	Industrial Wastewater Pretreatment Plant
IWTF	Industrial Wastewater Treatment Facility
JP	Jet propellant
K_d	Sorption coefficient
LTA	Lighter-than-air
LUC	Land-use control
MCL	Maximum contaminant level
MEK	Methyl ethyl ketone
MEW	Middlefield-Ellis-Whisman
MFA	Moffett Federal Airfield
mg/kg	Milligrams per kilogram
MIL-SPEC	Military specification
MOU	Memorandum of Agreement
MRL	Minimal Risk Levels
MS	Matrix spike

ABBREVIATIONS AND ACRONYMS (CONTINUED)

NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
NAVFAC	Naval Facilities Engineering Command
Navy	United States Department of the Navy
NEtFOSAA	n-Ethyl perfluorooctanesulfonamidoacetic acid
NFA	No Further Action
ng/L	Nanograms per liter
NHANES	National Health and Nutrition Examination Survey
NL	Notification Level
NO_3	Nitrate
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NWI	National Wetlands Inventory
OARF	Outdoor Aerodynamic Research Facility
OEHHA	State of California Office of Environmental Health Hazard Assessment
ORP	Oxidation-reduction potential
OU	Operable unit
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbon
PAR	PA Report
PCE	Tetrachloroethene
PCB	Polychlorinated biphenyl
PFAS	Per- and polyfluoroalkyl substances
PFBA	Perfluorobutanoic acid
PFBS	Perfluorobutane sulfonic acid
PFDA	Perfluorodecanoic acid
PFDoA	Perfluorododecanoic acid
PFDS	Perfluorodecanesulfonic acid
PFHpA	Perfluoroheptanoic acid
PFHpS	Perfluoroheptanesulfonic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFNS	Perfluorononanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFPeA	Perfluoropentanoic acid
PFPeS	Perfluoropentanesulfonic acid
PFTeA	Perfluorotetradecanoic acid
PFTrDA	Perfluorotridecanoic acid

ABBREVIATIONS AND ACRONYMS (CONTINUED)

PFTrIA	Perfluorotridecanoic acid
PFUnA	Perfluoroundecanoic acid
ppb	Parts per billion
PPE	Personal protective equipment
PPRTV	Provision Peer-Reviewed Toxicity Value
ppt	Parts per trillion
PRC	PRC Environmental Management, Inc.
PRP	Potentially Responsible Party
PV	Planetary Ventures LLC
PVC	Polyvinyl chloride
QAPP	Quality Assurance Project Plan
QA/QC	Quality assurance/quality control
Qhac	Coarse-grained alluvium
Qhaf	Fine-grained alluvium
Qham	Medium-grained alluvium
QSM	Quality Systems Manual
Regional Water Board	San Francisco Bay Regional Water Quality Control Board
RfD	Reference dose
RGRP	Regional Groundwater Remediation Program
RI	Remedial Investigation
RL	Response Level
RO	Reverse osmosis
ROD	Record of Decision
RP	Responsible Party
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SCR	Site cleanup requirement
SEA	Shuttle Environmental Assurance
SI	Site Inspection
SIWP	SI Work Plan
SOP	Standard Operating Procedure
SSHASP	Site-specific Health and Safety Plan
SVOC	Semi-volatile organic compound
SWRP	Stormwater Retention Pond
SWSB	Stormwater Settling Basin
TCA	Trichloroethane
TCE	Trichloroethene
Tetra Tech	Tetra Tech, Inc.
TPH	Total petroleum hydrocarbons

ABBREVIATIONS AND ACRONYMS (CONTINUED)

UCMR	Unregulated Contaminant Monitoring Rule
UOT	Underground overflow tank
USCS	United Soil Classification System
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	Underground storage tank
Vista	Vista Analytical Laboratory
VOC	Volatile organic compound
V/STOL	Vertical and/or short take-off and landing
VTDEC	Vermont Department of Environmental Conservation
WATS	West-Side Aquifers Treatment System

EXECUTIVE SUMMARY

This Site Inspection (SI) is part of an ongoing effort to identify sources and presence of per- and polyfluoroalkyl substances (PFAS) at the National Aeronautics and Space Administration (NASA) Ames Research Center (ARC) in Mountain View, California. Tetra Tech, Inc. (Tetra Tech) prepared this document for NASA. PFAS SI activities at ARC were conducted in accordance with the PFAS SI Work Plan (SIWP), but with some modifications, which are discussed in Section 4.7 of this report. The SIWP was included as an appendix to the ARC PFAS Preliminary Assessment (PA) Report (PAR) (Tetra Tech 2021a) and is also in Appendix A to this report for reference.

In May 2016, the United States Environmental Protection Agency (USEPA) issued a lifetime drinking water health advisory (HA) level for two PFASs (perfluorooctanoic acid [PFOA] and perfluorooctanesulfonic acid [PFOS]). In June 2022, USEPA Office of Land and Emergency Management issued interim updated drinking water lifetime HAs for PFOA and PFOS, and issued new lifetime drinking water HAs for perfluorobutanesulfonic acid (PFBS) and hexafluoropropylene oxide dimer acid (HFPO-DA), also known as GenX. Federal regional screening levels (RSLs) also have been established for soil and groundwater for PFOA, PFOS, PFBS, perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and HFPO-DA. The purpose of RSLs is to aid in decision-making concerning Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigations, and to help make the determination if chemical levels in site media warrant further investigation based on these risk-based levels or no further investigation is needed. As such, the RSLs are appropriate to use as screening criteria for this PFAS SI. The most recent RSL table, issued in May 2022, was used for screening in this SI report.

In California as well, health-based advisory values for drinking water and screening levels for soil and groundwater have been developed for PFOA and PFOS. In July 2018, the California State Water Resources Control Board (CSWRCB) Division of Drinking Water (DDW) established drinking water Notification Levels (NLs) for PFOS and PFOA. Information on California's advisory and screening levels is included in this report.

A PFAS PA at ARC between 2019 and 2020 occurred as part of an Agency-wide effort to identify areas of potential concern (AOPCs) at NASA Centers/Facilities. A PAR/SIWP was generated by use of information gathered from literature searches (facility documents), web-based searches (aqueous film-forming foam [AFFF] manufacturer specifications and PFAS use, regulations, and health effects), and site interviews/reconnaissance. Potential PFAS sources at NASA ARC included areas where AFFF had been used (e.g., fire-fighting training areas, equipment test areas, crash sites, fire suppression systems, and storage and transfer areas), electroplating facilities, areas that had received waste (e.g., landfills, waste disposal areas, and water treatment systems), and other potential sources (e.g., certain detergents, aviation hydraulic fluids, and manufacture of photographic supplies).

The PAR/SIWP identified 23 on-site (AOPCs 1 through 23), two off-site AOPCs (AOPCs 24 and 25), and one on- or off-site source (AOPC 26) where PFAS could be a concern. At 12 AOPCs within ARC (AOPCs 1, 2, 5 through 7, 11, 12, 16 through 19, and 23), the primary source of PFAS was AFFF. AFFF use or releases resulted from firefighting training activities, aircraft crashes, accidental AFFF discharges at four hangars, use by the fire department's mobile AFFF units, and releases into four stormwater ditches and systems and two National Pollutant Discharge Elimination System (NPDES) stormwater discharge points. Non-AFFF sources with potential PFAS use or releases were identified at 12 AOPCs (AOPCs 3, 4, 8 through 10, 13 through 15, 20 through 22, and 26). Non-AFFF sources with potential PFAS use or releases included three former unlined landfills, five hydraulic fluid disposal or related-use sites, one fuel storage area, vapor and brine from an industrial wastewater pretreatment plant (IWPP), and three groundwater extraction systems that treat volatile organic compounds (VOCs) potentially commingled with PFAS.

Within a 1-mile radius of ARC, non-AFFF sources with a potential PFAS release were identified at three AOPCs (AOPCs 24 through 26) where semiconductor and metal finishing operations had occurred over the Middlefield-Ellis-Whisman (MEW) regional plume, a trichloroethene

(TCE) plume migrating from Orion Park, and where discharges of PFAS could have come from the adjacent Lockheed Martin facility.

Multiple parties may be associated with the PFAS levels found at each AOPC. This includes the on-site Potentially Responsible Parties (PRPs) NASA, the California Air National Guard (CANG), and the Navy. It also includes off-site PRPs such as the MEW PRPs and Lockheed Martin. A PRP analysis is recommended to help determine responsibility and allocation of future investigation costs based on past history and information presented in this SI report.

The PAR/SIWP detailed project objectives, field inspection rationale and methodology, and reporting requirements for the SI. The SIWP recommended sampling all 26 AOPCs identified as potential PFAS source areas at ARC. These areas were selected based on known historical or suspected use of AFFF and/or protein-based foams, other sources of PFAS, and PFAS data previously collected at NASA ARC. The primary objectives of the SI were to inspect each identified potential source area for presence of PFAS as outlined in the SIWP, compare PFAS concentrations to screening levels (as applicable), and determine whether further investigation would be warranted. SI results will guide additional investigations and potential actions to mitigate exposure to PFAS-containing media. Areas recommended for SI included:

- AOPC 1 – Former Firefighting Training Area (Installation Restoration [IR] 10, 12, and 20)
- AOPC 2 – Crash Site (Sunnyvale Golf Course)
- AOPC 3 – Hangars 2 & 3 (IR 7)
- AOPC 4 – Former Engine Test Stand Area (IR 11)
- AOPC 5 – Hangar N211 (within Area of Interest [AOI] 3, formerly AOI 12)
- AOPC 6 – Hangar N248 (AOI 3 East)
- AOPC 7 – Fire Department (Building 580)
- AOPC 8 – Site 1 Runway Landfill (IR 1)
- AOPC 9 – Site 2 Former Golf Course Landfill (IR 2)
- AOPC 10 – Site 22 Landfill (IR 22)
- AOPC 11 – Building 191 Pump Station
- AOPC 12 – Stormwater Settling Basin/Eastern Diked Marsh (EDM) (within IR 25)
- AOPC 13 – NASA Groundwater Extraction Treatment System (GWETS)

- AOPC 14 – MEW GWETS
- AOPC 15 – West-Side Aquifers Treatment System (WATS) (IR 28)
- AOPC 16 – North Patrol Road Ditch (IR 21) and Northern Channel (IR 27)
- AOPC 17 – Marriage Road Ditch (IR 3)
- AOPC 18 – Lindbergh Avenue Storm Drain Ditch (AOI 6)
- AOPC 19 – Stormwater Retention Ponds (within IR 25)
- AOPC 20 – Building N271 IWPP
- AOPC 21 – Former Industrial Wastewater Surface Impoundment (IR 4)
- AOPC 22 – Building N249 Outdoor Aerodynamic Research Facility
- AOPC 23 – Hangar 4 (CANG) Building 662
- AOPC 24 – MEW Plume
- AOPC 25 – Orion Park Plume
- AOPC 26 – Eastern Boundary (IR 5)

Tetra Tech conducted field activities supporting the SI from July 7 to August 18, 2021. Sampled media included soil (surface and subsurface [from surface to 2 feet below ground surface {bgs}]), groundwater (existing and new permanent monitoring wells), and influent/effluent of water treatment systems. BB&E later performed surface water sampling on November 12, 2021, when sufficient precipitation allowed accumulation of enough surface water for adequate sample collection. Tetra Tech received surface water data for inclusion in this report. Pace Laboratory analyzed all PFAS samples via a method compliant with Table B-15 of the United States Department of Defense (DoD) Quality Systems Manual (QSM) version 5.3. The 28 PFAS compounds in the USEPA Method 537.1 list were analytes which included PFAS compounds from CSWRCB order for determination of PFAS at chrome plating facilities. Of the 28 PFAS compounds, analytical results detected the following 24 PFAS analytes:

1. 4:2 fluorotelomer sulfonate
2. 6:2 fluorotelomer sulfonate
3. 8:2 fluorotelomer sulfonate
4. PFOA
5. PFOS
6. PFBS

7. perfluorobutanoic acid (PFBA)
8. perfluorodecanoic acid (PFDA)
9. perfluorododecanoic acid (PFDoA)
10. perfluorodecanesulfonic acid (PFDS)
11. perfluoroheptanesulfonic acid (PFHpS)
12. perfluoroheptanoic acid (PFHpA)
13. perfluorohexanoic acid (PFHxA)
14. PFHxS
15. PFNA
16. Perfluorononanesulfonic acid (PFNS)
17. Perfluorooctane sulfonamide (FOSA)
18. Perfluoropentanoic acid (PFPEA)
19. Perfluoropentanesulfonic acid (PFPES)
20. perfluorotetradecanoic acid (PFTeA)
21. perfluorotridecanoic acid (PFTrDA or PFTfIA)
22. perfluoroundecanoic acid (PFUnA)
23. n-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)
24. HFPO-DA, also known as GenX

PFAS concentrations in soil and groundwater samples were compared to applicable human health-based screening levels to determine where further investigation would be necessary. The groundwater screening levels used in this SI include the USEPA RSL of 4 nanograms per liter (ng/L) for PFOS, 6 ng/L for PFOA, 5.9 ng/L for PFNA, 39 ng/L for PFHxS, 600 ng/L for PFBS, and 6 ng/L for HFPO-DA. Data also were screened against the CSWRCB and San Francisco Bay Regional Water Quality Control Board (Regional Water Board) Interim Environmental Screening Levels (ESL) for PFOA (5.1 ng/L) and PFOS (6.5 ng/L).

Soil screening levels used in this SI include the USEPA RSL of 13 micrograms per kilogram (µg/kg) for PFOS, 19 µg/kg for PFOA and PFNA, 130 µg/kg for PFHxS, 1,900 µg/kg for PFBS, and 23 µg/kg for HFPO-DA. Soil screening levels also include the CSWRCB interim ESL of 3.8

µg/kg (human health) and 84 µg/kg (ecological) for PFOA, and 12 µg/kg (human health) and 13 µg/kg (ecological) for PFOS (CSWRCB 2020a, Regional Water Board 2020).

No USEPA PFAS screening levels have been established for surface water or influent/effluent. As a result, surface water data acquired during the SI appear in this report but are not compared to any screening levels. Influent/effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. At ARC, discharges of surface water from Building 191 pump station (AOPC 11) flow east and are pumped over a dike and directly discharged to the Guadalupe Slough. Treated water from NASA GWETS (AOPC 13) and MEW GWETS (AOPC 14) either discharges to Stevens Creek or is treated via reverse osmosis at the Building N271 IWPP (AOPC 20) and then used for the ARC Jet Complex before discharge into the Palo Alto Sanitary Sewer. Treated water from the WATS (AOPC 15) is discharged into the storm drains where it flows through the EDM (AOPC 12) into the Stormwater Retention Pond (SWRP).

Conclusions and recommendations for each AOPC are below, with detected concentrations of PFAS compared to State of California ESLs and USEPA RSLs. Figures included in this report present PFAS data, which are compared to USEPA RSLs, as applicable. The tables included in this report include full PFAS datasets, which are compared to USEPA and State ESLs, as applicable.

<u>AOPC 1 – Former Firefighting Training Area (IR 10, 12, 20)</u>

- **Soil**: PFOS was detected at concentrations exceeding the soil RSL of 13 µg/kg in five samples and above the human health and ecologic ESLs of 12 and 13 µg/kg, respectively, in five samples. PFOA was detected at concentrations exceeding the human health ESL of 3.8 µg/kg in five samples. PFOA concentrations exceeded the ecologic ESL of 84 µg/kg in one sample. PFOA exceeded the soil RSL of 19 µg/kg in three samples. There were no exceedances of the RSL by concentrations of PFNA, PFHxS, HFPO-DA, or PFBS.

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and exceeding the groundwater ESL of 5.1 ng/L in six samples. PFOS was

detected at concentrations exceeding the groundwater RSL of 4 ng/L and exceeding the groundwater ESL of 6.5 ng/L in seven samples. PFHxS was also detected at concentrations exceeding the groundwater RSL of 39 ng/L in six samples. PFNA was detected at a concentration exceeding the groundwater RSL of 5.9 ng/L in one sample. There were no PFBS screening level exceedances, and HFPO-DA was non-detect in all samples.

Prior to this SI, some groundwater samples were collected at AOPC 1. During the September 2019 sampling event, groundwater samples were collected at two locations at AOPC 1. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and exceeding the groundwater ESL of 5.1 ng/L in both samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and exceeding the groundwater ESL of 6.5 ng/L in both samples. PFHxS also was detected at concentrations exceeding the groundwater RSL of 39 ng/L in both samples. PFNA was detected at a concentration exceeding the groundwater RSL of 5.9 ng/L in one sample. PFBS also was detected at a concentration exceeding the groundwater RSL of 600 ng/L in one sample.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater and soil is recommended.

<u>AOPC 2 – Crash Site (Sunnyvale Golf Course)</u>

- **Soil**: PFOS was detected at concentrations exceeding the RSL, human health and ecologic ESLs in four samples. **PFOA** was detected at concentrations exceeding the human health ESL of 3.8 µg/kg in four samples. PFBS, PFHxS, and PFNA were not detected above screening criteria. HFPO-DA was non-detect in all samples.

- **Groundwater**: PFOS was detected at concentrations exceeding the groundwater ESL of 6.5 ng/L and the groundwater RSL of 4 ng/L in three samples. PFOA, PFBS, PFNA, and PFHxS did not exceed any screening values. HFPO-DA was non-detect in all samples.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater and soil is recommended.

AOPC 3 – Hangars 2 & 3 (IR 7)

- **Groundwater**: PFOA was detected at a concentration exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in six samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL in seven samples. PFNA was detected at a concentration exceeding the groundwater RSL of 5.9 ng/L in one sample. HFPO-DA was detected at a concentration exceeding the groundwater RSL of 6 ng/L in one sample. PFHxS was detected at concentration exceeding the groundwater RSL of 39 ng/L in five samples. PFBS was non-detect in all samples.

- **Recommendation**: Further investigation of horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 4 – Former Engine Test Stand Area (IR 11)

- **Groundwater**: PFOA was detected at a concentration exceeding the groundwater RSL of 6 ng/L and groundwater ESL of 5.1 ng/L in both samples. There were no screening level exceedances for PFBS, PFHxS, or PFOS. PFNA and HFPO-DA were non-detect in all samples.

- **Recommendation**: Further investigation of horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 5 – Hangar N211 (within AOI 3, formerly AOI 12)

- **Groundwater**: PFBS was detected in one sample at a concentration exceeding the groundwater RSL of 600 ng/L. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in seven samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in seven samples. PFHxS was detected at concentrations

exceeding the groundwater RSL of 39 ng/L in five samples. PFNA was detected at concentrations exceeding the groundwater RSL of 5.9 ng/L in five samples. HFPO-DA was non-detect in all samples.

- **Recommendation**: Further investigation of horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 6 – Hangar N248 (AOI 3 East)

- **Soil**: PFOS was detected at concentrations exceeding the RSL of 13 µg/kg and the human health and ecologic ESLs of 12 and 13 µg/kg respectively in two samples. PFOA was detected at a concentration exceeding the human health ESL of 3.8 µg/kg in one sample. There were no detections exceeding PFBS, PFNA, or PFHxS screening levels. HFPO-DA was non-detect in all samples.

- **Groundwater**: PFBS was detected at concentrations exceeding the groundwater RSL of 600 ng/L in one sample. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in all three samples. PFOS was also detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in all three samples. PFHxS exceeded the groundwater RSL of 39 ng/L in three samples, and PFNA exceeded the groundwater RSL of 5.9 ng/L in one sample. HFPO-DA was non-detect in all samples.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater and soil is recommended.

AOPC 7 – Fire Department (Building 580)

- **Soil**: PFOS was detected at concentrations exceeding the soil RSL of 13 µg/kg and the human health and ecologic ESLs of 12 and 13 µg/kg, respectively, in all four samples. PFOA was detected at a concentration exceeding the human health ESL of 3.8 µg/kg in one sample. There were no PFHxS, PFNA, or PFBS screening level exceedances. HFPO-DA was non-detect in all samples.

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples. PFHxS exceeded the groundwater RSL of 39 ng/L in four samples, and PFNA exceeded the groundwater RSL of 5.9 ng/L in one sample. PFBS did not exceed any screening levels. HFPO-DA was non-detect in all samples.

- **Recommendations**: Further investigation of horizontal and vertical extents of PFAS in groundwater and soil is recommended. For the purposes of further investigation, AOPC 7 will be subsumed into AOPC 1 as the PFAS are the same or similar, and AOPC 7 is within AOPC 1.

AOPC 8 – Site 1 Runway Landfill (IR 1)

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in two samples. PFOS, PFBS, and PFHxS did not exceed any screening levels. PFNA and HFPO-DA were non-detect in all samples.

- **Recommendation**: Further investigation of horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 9 – Site 2 Former Golf Course Landfill (IR 2)

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in three samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in three samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in three samples. PFBS and PFNA did not exceed any screening levels. HFPO-DA was non-detect in all samples.

- **Recommendation**: Further investigation of horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 10 – Site 22 Landfill (IR 22)

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in five samples. PFOS was detected at a concentration exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples. PFHxS was detected at concentration exceeding the groundwater RSL of 39 ng/L in one sample. PFBS and PFNA did not exceed any screening levels. HFPO-DA was non-detect in all samples.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 11 – Building 191 Pump Station

- **Surface water**: PFNA was detected at concentration of 13 ng/L, PFHxS was detected at a concentration of 930 ng/L, PFBS was detected at concentration of 130 ng/L, PFOA was detected at a concentration of 340 ng/L, and PFOS was detected at a concentration of 1,400 ng/L. HFPO-DA was non-detect in all samples. No screening levels have been established for surface water.

- **Recommendations**: Further investigation of the presence of PFAS in surface water is recommended, including the possibility of a pathway between AOPC 11 (Building 191 Pump Station), AOPC 16 (North Patrol Road Ditch and Northern Channel), and AOPC 17 (Marriage Road Ditch).

AOPC 12 – Stormwater Settling Basin/EDM (within IR 25)

- **Surface water**: PFBS was detected at a concentration of 4 ng/L, PFOA was detected at an estimated concentration of 1.1 ng/L, PFHxS was detected at 6 ng/L, and PFOS was detected at a concentration of 5.5 ng/L. HFPO-DA and PFNA were non-detect in all samples. No screening levels have been established for surface water.

- **Recommendations**: Further investigation of the sources and extent of PFAS in surface water in AOPC 12 is recommended.

AOPC 13 – NASA Groundwater Extraction Treatment System

- **Influent/Effluent**: Influent/effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. Concentrations in the influent sample exceeded the groundwater RSLs for PFOS, PFHxS, and PFOA, as well as the groundwater ESLs for PFOS and PFOA. Concentrations in the effluent sample exceeded the groundwater RSL of 4 ng/L; however, concentrations in the duplicate sample were under the RSL.

- **Surface water**: PFBS was detected at estimated concentration of 1.3 ng/L, PFOA was detected at estimated concentration of 1.1 ng/L, PFHxS was detected at 5.4 ng/L, and PFOS was detected at 7.4 ng/L. HFPO-DA and PFNA were not detected in the sample. No screening levels for surface water have been established.

- **Recommendation**: Further investigation of the extents of PFAS in surface water at AOPC 13 is recommended, along with routine quarterly monitoring of the influent and effluent and taking additional steps as needed based on results.

AOPC 14 – MEW Groundwater Extraction Treatment System

- **Influent/Effluent**: Influent/effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. Concentrations in both samples exceeded the groundwater RSLs for PFOS, PFOA, and PFHxS, as well as the groundwater ESLs for PFOS and PFOA. In all cases except for PFBA and PFPeA, the influent concentration was higher than the effluent concentration, and for these two compounds the difference was negligible.

- **Surface water**: PFBS was detected at an estimated concentration of 1.3 ng/L, PFOA was detected at an estimated concentration of 1.1 ng/L, PFHxS was detected at 5.4 ng/L, and PFOS was detected at 7.4 ng/L. HFPO-DA and PFNA were non-detect in all samples. No screening levels have been established for surface water.

- **Recommendation**: Further investigation of discharges from the MEW GWETS into Stevens Creek is recommended (no PFAS has been detected in effluent from NASA's

GWETS). Routine quarterly monitoring of the influent and effluent is also recommended, and additional steps should be taken based on results. The MEW GWETS should be updated to reduce concentrations of PFAS to below appropriate discharge concentrations in Stevens Creek.

AOPC 15 – West-Side Aquifers Treatment System (IR 28)

- **Influent/Effluent**: Influent and effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. Concentrations in the influent sample exceeded groundwater RSLs for PFOS, PFOA, and PFHxS, as well as groundwater ESLs for PFOS and PFOA. Twelve of the 28 PFAS compounds were detected in the influent sample from AOPC 15. The only PFAS compound detected in the effluent sample was PFBA at an estimated concentration of 3.9 ng/L.

- **Recommendation**: Routine quarterly monitoring of the influent and effluent is recommended, and additional steps should be taken as needed based on results.

AOPC 16 – North Patrol Road Ditch (IR 21) and Northern Channel (IR 27)

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples. PFOS was also detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in three samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in two samples. PFBS and PFNA were not detected at concentrations exceeding any screening levels, and HFPO-DA was non-detect in all samples.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended. The pathway of PFAS in surface water between AOPC 11 (Building 191 Pump Station), AOPC 16 (North Patrol Road Ditch and Northern Channel), and AOPC 17 (Marriage Road Ditch) should also be investigated.

AOPC 17 – Marriage Road Ditch (IR 3)

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in four samples. PFHxS was detected at concentrations exceeding the groundwater RSL in four samples. PFNA, PFBS, and HFPO-DA were not detected at concentrations exceeding any screening levels.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended. The pathway of PFAS in surface water between AOPC 11 (Building 191 Pump Station), AOPC 16 (North Patrol Road Ditch and Northern Channel), and AOPC 17 (Marriage Road Ditch) should also be investigated.

AOPC 18 – Lindbergh Avenue Storm Drain Ditch (AOI 6)

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in two samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in all three samples. PFHxS was detected at concentrations exceeding the groundwater RSL in two samples. PFBS and PFNA did not exceed any screening levels. HFPO-DA was non-detect in all samples.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 19 – Stormwater Retention Ponds (within IR 25)

- **Surface water**: One surface water sample was collected at AOPC 19. However, this sample was flagged during data validation and not included in the data evaluation.

- **Recommendations**: Re-sampling of surface water is recommended for AOPC 19, along with sediment sampling.

AOPC 20 – Building N271 IWPP

- **Effluent**: Effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. Concentrations in the sample exceeded the groundwater RSLs for PFOS, PFOA, and PFHxS, and the groundwater ESLs for PFOS and PFOA. There were no PFBS screening level exceedances, and PFNA and HFPO-DA were non-detect in all samples.

- **Recommendation**: Routine quarterly monitoring of the effluent is recommended, and additional steps should be taken as needed based on results.

AOPC 21 – Former Industrial Wastewater Surface Impoundment (IR 4)

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in seven samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples. One sample also exceeded the groundwater ESL for PFOS (6.4 ng/L). PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in five samples. PFNA, PFBS, and HFPO-DA were not detected at concentrations exceeding any screening level.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 22 – Building N249 Outdoor Aerodynamic Research Facility

- **Groundwater**: PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in three samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in one sample. PFOA, PFNA, PFBS, and HFPO-DA were not detected at concentrations exceeding any screening levels.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 23 – Hangar 4 (CANG) Building 662

- **Groundwater/Soil/Sediment**: No samples were collected at AOPC 23 during the SI as previous sampling efforts already identified the presence of PFAS at this site. However, during the SI, one groundwater sample was collected from a new well, PFAS-C, which is near a well previously sampled for AOPC 23. Results from PFAS-C are discussed in Section 5.23 and results from previous sampling in 2018-2019 at AOPC 23 are discussed in Section 3.6.23

- **Recommendation**: A remedial investigation is recommended for AOPC 23.

AOPC 24 – Middlefield-Ellis-Whisman (MEW) Plume

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in one sample. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L in three samples. PFOS also exceeded the groundwater ESL of 6.5 ng/L in two samples. PFHxS was detected at a concentration exceeding the groundwater RSL of 39 ng/L in one sample. PFBS was not detected at concentrations exceeding any screening levels. PFNA and HFPO-DA were non-detect in all samples.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 25 – Orion Park Plume

- **Groundwater**: PFOS was detected at concentrations exceeding the groundwater ESL of 6.5 ng/L in one sample and exceeding the groundwater RSL of 4 ng/L in two samples. PFOA, PFNA, PFHxS, HFPO-DA, and PFBS were not detected at any concentrations exceeding any screening levels.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

AOPC 26 – Eastern Boundary (IR-5)

- **Groundwater**: PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L. PFNA and PFHxS exceeded the groundwater RSLs of 5.9 ng/L and 39 ng/L, respectively. The detected concentration of PFBS did not exceed any screening level, and HFPO-DA was non-detect in all samples.

- **Recommendation**: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

All 26 AOPCs included in this SI are recommended for further PFAS evaluation based on data exceeding screening levels or the need to collect additional data to evaluate potential PFAS impacts (e.g., AOPC 19 - Stormwater Retention Pond [within IR 25]). The highest detections for PFAS compounds with USEPA RSLs that have been identified in groundwater and soil, respectively, at ARC to date include: PFOS (40,000 ng/L, 1,900 µg/kg), PFOA (5,540 ng/L, 120 µg/kg), PFBS (1,500 ng/L, 1.8 µg/kg), HPFO-DA (estimated 6.10 ng/L, not detected in soil), PFHxS (10,400 ng/L, 92.0 µg/kg), and PFNA (111 ng/L, 2.60 µg/kg).

Currently the SI data indicate that PFAS are present in the surface water migrating off-site. Further investigation is necessary to determine if there are unacceptable impacts from the presence of PFAS in off-site surface water based on determination of potential receptors and development of risk-based criteria using site specific parameters.

SECTION 1
INTRODUCTION

This Site Inspection (SI) Report documents activities and results of the per- and polyfluoroalkyl substances (PFAS) SI at the National Aeronautics and Space Administration (NASA) Ames Research Center (ARC) in Mountain View, California (Figure 1-1). Tetra Tech, Inc. (Tetra Tech) prepared this document for NASA. PFAS SI activities at ARC were conducted in accordance with the PFAS SI Work Plan (SIWP), but with some modifications, which are discussed in Section 4.7. The SIWP was included as an appendix to the ARC Preliminary Assessment (PA) Report (PAR) (Tetra Tech 2021a). The SIWP is also in Appendix A to this document for reference.

1.1 OBJECTIVES

A total of 26 areas of potential concern (AOPCs) were identified during the ARC PFAS PA conducted in 2019-2020 (Figure 1-2). One AOPC (AOPC 23) was not investigated during the SI as the presence of PFAS already had been identified during previous investigations; therefore, this AOPC moved directly into the RI phase (further discussed in Sections 3.6.23 and 5.23).

Identification of AOPCs during the ARC PFAS PA was based on known or suspected use and/or releases of PFAS. Potential PFAS sources investigated during the PA included aqueous film forming foam (AFFF) release areas, electroplating facilities, wastewater treatment facilities, waste disposal areas, and other industrial sources, such as PFAS-containing resins, elastomers, or telomer products associated with the former Space Shuttle Program, aviation hydraulic fluids, and specialty paints and coatings. Primary objectives of the SI were to inspect each identified potential source area for presence of PFAS as outlined in the SIWP, compare PFAS concentrations to screening levels (as applicable), and determine whether further investigation would be warranted.

The potential source areas identified during the PA included AFFF release areas, electroplating facilities, landfills and other solid waste disposal areas, and water treatment systems. The SIWP proposed collecting 72 groundwater samples, four surface water samples, 28 soil samples, and eight influent/effluent samples from water treatment systems. The AOPCs included:

- AOPC 1 – Former Firefighting Training Area (Installation Restoration [IR] 10, 12, 20)
- AOPC 2 – Crash Site (Sunnyvale Golf Course)
- AOPC 3 – Hangars 2 & 3 (IR 7)
- AOPC 4 – Former Engine Test Stand Area (IR 11)
- AOPC 5 – Hangar N211 (within Area of Investigation [AOI] 3, formerly AOI 12)
- AOPC 6 – Hangar N248 (AOI 3 East)
- AOPC 7 – Fire Department (Building 580)
- AOPC 8 – Site 1 Runway Landfill (IR 1)
- AOPC 9 – Site 2 Former Golf Course Landfill (IR 2)
- AOPC 10 – Site 22 Landfill (IR 22)
- AOPC 11 – Building 191 Pump Station
- AOPC 12 – Stormwater Settling Basin/Eastern Diked Marsh (EDM) (within IR 25)
- AOPC 13 – NASA Groundwater Extraction Treatment System
- AOPC 14 – Middlefield-Ellis-Whisman (MEW) Groundwater Extraction Treatment System
- AOPC 15 – West-Side Aquifers Treatment System (IR 28)
- AOPC 16 – North Patrol Road Ditch (IR 21) and Northern Channel (IR 27)
- AOPC 17 – Marriage Road Ditch (IR 3)
- AOPC 18 – Lindbergh Avenue Storm Drain Ditch (AOI 6)
- AOPC 19 – Stormwater Retention Ponds (within IR 25)
- AOPC 20 – Building N271 Industrial Wastewater Pretreatment Plant
- AOPC 21 – Former Industrial Wastewater Surface Impoundment (IR 4)
- AOPC 22 – Building N249 Outdoor Aerodynamic Research Facility
- AOPC 23 – Hangar 4 (California Air National Guard [CANG]) Building 662
- AOPC 24 – Middlefield-Ellis-Whisman (MEW) Plume
- AOPC 25 – Orion Park Plume
- AOPC 26 – Lockheed Martin (Will be referred to as the Eastern Boundary – IR 5 in this SI and forward)

1.2 REPORT ORGANIZATION

This report is organized as follows:

Section 1: Introduction – Introduction, objectives, and report organization of the SI.

Section 2: PFAS Overview – Background and history of PFAS, health effects and advisory levels of PFAS, and screening levels applicable to this SI.

Section 3: Facility Background and History – Background and history of the Center and each AOPC, along with the conceptual site model (CSM).

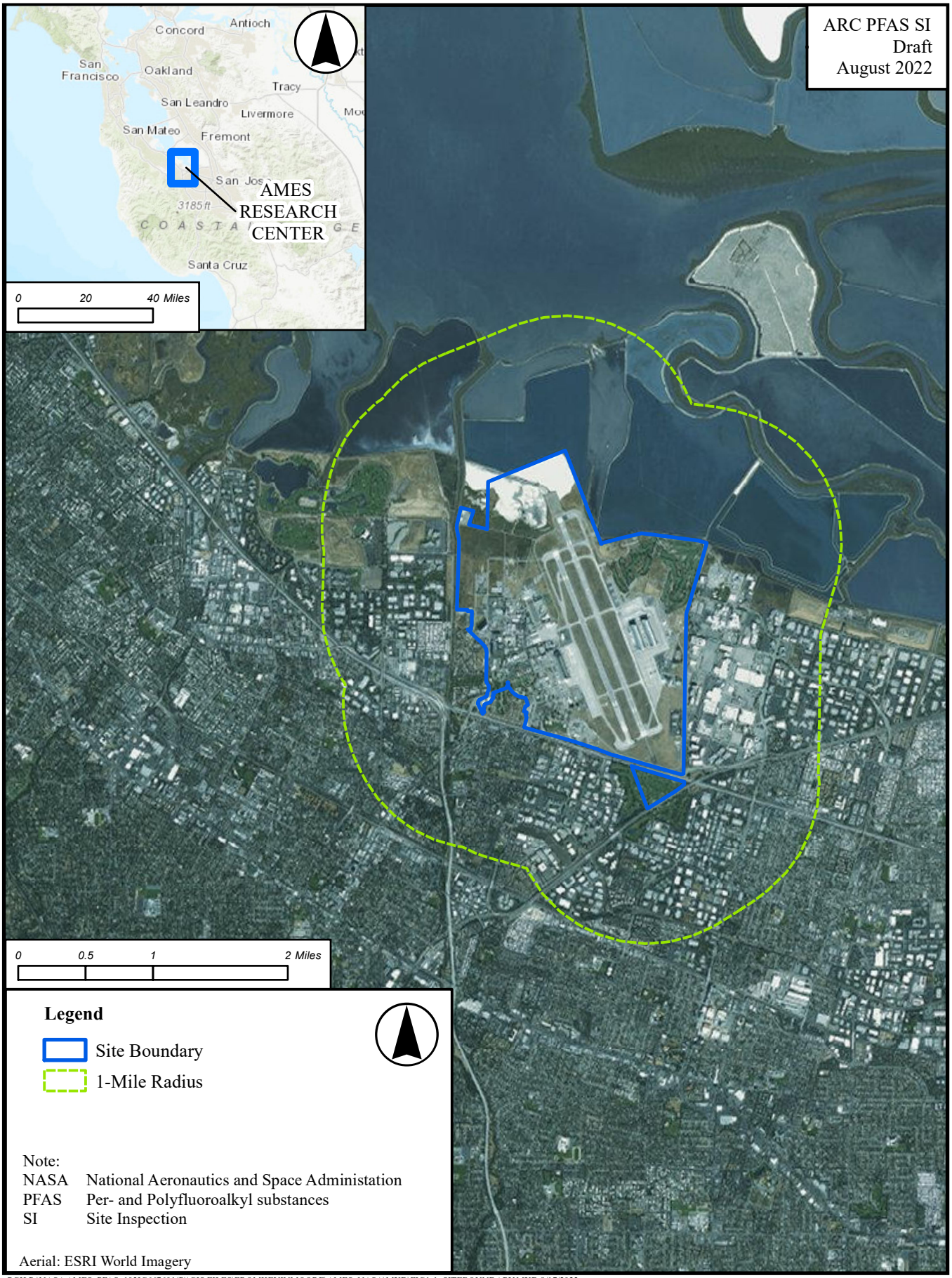
Section 4: Field Activities – Description of field inspection activities.

Section 5: Analytical Results and Findings – Documentation of analytical results and findings.

Section 6: Conclusions and Recommendations – Summary of conclusions regarding each AOPC and recommendations for path forward.

Section 7: References – List of sources cited in this SI Report.

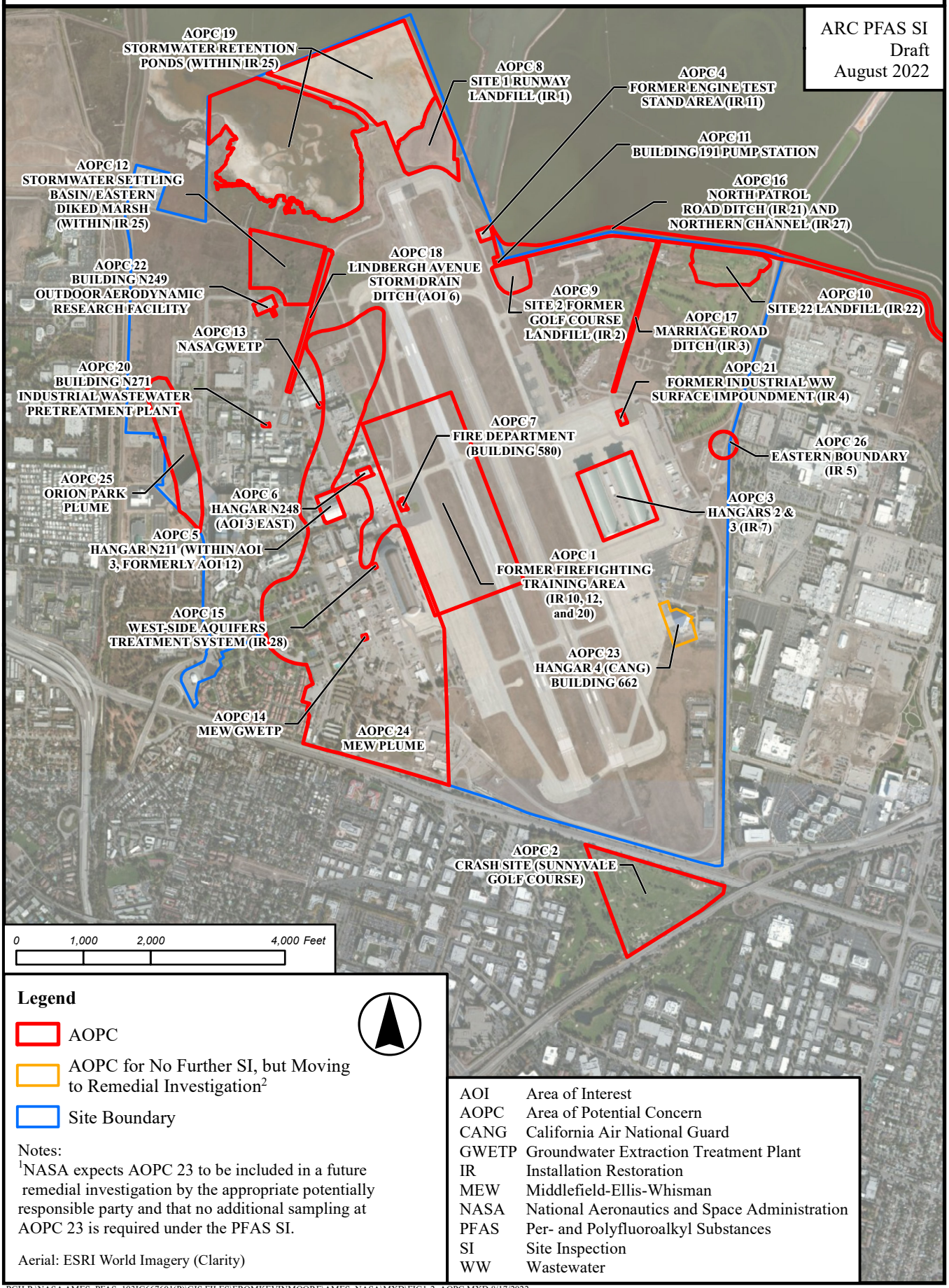
FIGURE 1-1 AMES RESEARCH CENTER LOCATION MAP
PFAS SITE INSPECTION FOR AMES RESEARCH CENTER



PGH:P:\NASA AMES_PFAS_103IG667601(P)\GIS FILES\FROMKEVINMOORE\AMES_NASA\MXD\FIG1-1_SITEBOUNDARY.MXD 8/17/2022

FIGURE 1-2 OVERVIEW OF AREAS OF POTENTIAL CONCERN

PFAS SITE INSPECTION FOR AMES RESEARCH CENTER



PGH:P:\NASA AMES_PFAS_103IG667601(P)\GIS FILES\FROMKEVINMOORE\AMES_NASA\MXD\FIG1-2_AOPC.MXD 8/17/2022

SECTION 2
PFAS OVERVIEW

This section discusses chemical and physical properties of PFAS, identifies major sources of PFAS released to the environment as a result of manufacturing and wide-spread use of these chemicals in many commercial products, and summarizes health effects criteria and regulatory status available for specific PFAS.

2.1 PFAS BACKGROUND

PFAS consist of a wide variety of substances of more than 3,000 (some recent estimates are 5,000 to 10,000) manmade chemicals (Interstate Technology Regulatory Council [ITRC] 2017). The PFAS class at the focus of this inspection encompasses the non-polymer perfluoroalkyl and polyfluoroalkyl substances that have been identified as emerging contaminants by the United States Environmental Protection Agency (USEPA). Structurally, PFAS have a polar and hydrophilic (water-affinity) functional head and hydrophobic (water-repelling) and oleophobic (oil-resistant) tail, which give them surfactant properties. As such, many of the non-polymer PFAS were manufactured and used as surfactants in a variety of commercial products.

The strong carbon-fluorine bond and surfactant properties rendered PFAS ideal for use in a wide variety of commercial and industrial products, beginning in the 1940s with initial production for use in non-stick coatings (ITRC 2017). Since the 1940s, PFAS were manufactured for use in stain and water-resistant products, firefighting foam, protective coatings, food packaging, clothing, and personal care products (e.g., some insect repellents, sunscreens, and shampoo formulations). PFAS were detected in the blood of the general population in the 1990s after biomonitoring for this class of chemicals was added to the Centers for Disease Control and Prevention's (CDC) National Health and Nutrition Examination Survey (NHANES) protocol, and this was attributed to pervasive use of PFAS in commercial and industrial products. The principal manufacturer of PFAS, 3M, began to phase out production of longer chain PFAS in the early 2000s; however, PFAS are still manufactured globally. Products were reformulated to contain shorter chained PFAS, including polyfluoroethers and other replacement compounds that are still used today by U.S. manufacturers.

Currently, published values associated with chemical and physical properties of PFAS vary. However, the carbon-fluorine bonds in PFAS are exceptionally strong, resulting in resistance to degradation, low chemical reactivity, compound stability, and persistence in the environment (Agency for Toxic Substances and Disease Registry [ATSDR] 2021). Two of the most studied PFAS detected in the environment are the 8-carbon chain perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS).

Major sources of PFAS with potential to impact the environment include AFFF release sites, PFAS or PFAS-products manufacturing facilities, landfills, and biosolids and effluent from WWTPs (ITRC 2017). The aerospace industry also utilizes PFAS-containing products in coatings, paints, greases, resins, and elastomers because of their high-performance properties (Shuttle Environmental Assurance [SEA] 2010, NASA 2013). High-volume use and disposal of these materials in significant amounts may be a source of PFAS to the environment.

2.2 PFAS HEALTH EFFECTS AND ADVISORY LEVELS

Limited information is available on only a few PFAS regarding potential health effects caused by exposure to PFAS. USEPA's hierarchy for selecting toxicity values provides three tiers: USEPA's Integrated Risk Information System (IRIS) as the first tier, Provision Peer-Reviewed Toxicity Values (PPRTVs) as the second tier, and "other toxicity values" as the third tier (USEPA 2003b). Currently, no final Tier 1 toxicity values have been established for any PFAS. Tier 1 toxicity values are the preferred source for toxicity factors for completion of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) human health risk assessments. However, other sources of toxicity information have been used to develop lifetime drinking water health advisory (HA) levels for four PFAS (PFOA, PFOS, perfluorobutanesulfonic acid [PFBS] and hexafluoropropylene oxide dimer acid [HFPO-DA, also known as GenX]) (USEPA 2022a), and to calculate USEPA Regional Screening Levels (RSLs) for six PFAS (PFOA, PFOS, PFBS, HFPO-DA, perfluorohexanesulfonic acid [PFHxS], and perfluorononanoic acid [PFNA]) (USEPA 2022b).

2.2.1 USEPA Health Based Values for PFAS

In 2006, USEPA started a stewardship program in an attempt to phase out the most widely used PFAS (specifically PFOA and PFOS); however, many other PFAS remain in wide use. In May 2016,

the USEPA Office of Water issued drinking water lifetime HAs for PFOA and PFOS based on reference doses (RfDs) developed by the Office of Water (USEPA 2016a, 2016b). HAs are not enforceable regulatory levels. A lifetime HA is set based on an assumption of a lifetime of exposure to PFOA and PFOS from drinking water. The 2016 Office of Water lifetime HAs are 70 nanograms per liter (ng/L) (or parts per trillion [ppt]) for PFOA and 70 ng/L for PFOS. These HAs for PFOA and PFOS had been used as drinking water targets by many states and as action limits for drinking water investigations by the DoD until they were superseded by updated drinking water lifetime HAs in June 2022.

On June 15, 2022, USEPA Office of Water (USEPA 2022a) issued interim updated drinking water lifetime HAs for PFOA and PFOS, and provided new lifetime drinking water HAs for PFBS and HFPO-DA. USEPA issued interim HAs for PFOA and PFOS because the associated health effects assessments are in draft form, but there is a pressing need to provide information to public health officials prior to finalization of the health effects assessment. The interim updated HAs for PFOA and PFOS are based on the draft November 2021 toxicity assessments currently under review by the Science Advisory Board. Once the review is completed, the interim HAs may change based on the best available science. The new HAs for PFBS and HFPO-DA (GenX) are based on USEPA's 2021 final toxicity assessments for these PFAS (USEPA 2021a and 2021b, respectively). The June 2022 HAs are summarized as follows:

Chemical	Lifetime Health Advisory (ppt)
PFOA	0.004 (Interim)
PFOS	0.02 (Interim)
PFBS	2000 (Final)
HFPO-DA	10 (Final)

In May 2022, USEPA's RSL Tables were published with RSLs for PFOA, PFOS, PFBS, HFPO-DA (GenX), PFHxS, and PFNA. The purpose of RSLs is to aid in decision-making concerning CERCLA investigations, and to help make the determination if chemical levels in site media warrant further investigation based on these risk-based levels or no further investigation is needed. As such, the RSLs are appropriate to use as screening criteria for this PFAS SI. A recent United States Department of Defense (DoD) memorandum (DoD 2022) also directs use of soil and tapwater RSLs

for these six PFAS. New RSLs were developed for PFOA, PFOS, PFHxS, PFNA, and HFPO-DA (GenX), as documented in the updated May 2022 EPA RSL Tables (USEPA 2022b). The screening values for PFBS remained unchanged since the May 2021 update to the RSL Tables. The screening values for PFBS and HFPO-DA (also known as GenX) are based on USEPA's 2021 final toxicity assessment RfDs for those compounds (USEPA 2021a and 2021b, respectively). Screening values for PFOA, PFOS, PFHxS, and PFNA area based on ATSDR's 2021 RfDs (ATSDR 2021). The following section provides brief discussions on the studies and critical effects on which the toxicity values used in the RSL calculations are based.

PFBS: The USEPA Office of Research and Development released Human Health Toxicity Values for PFBS (CASRN 375-73-5) and Related Compound Potassium Perfluorobutane Sulfonate (CASRN 29420-49-3) in April 2021 (USEPA 2021a). This toxicity assessment provided a chronic oral RfD of 0.0003 milligrams per kilogram per day (mg/kg-day) and a subchronic RfD of 0.0009 mg/kg-day for PFBS, and considered Tier 2 noncarcinogenic toxicity values for use in CERCLA investigations. The PFBS oral RfDs are based on thyroid effects (decreased thyroid hormone levels). Due to lack of information in the current literature on PFBS inhalation toxicity or carcinogenicity, toxicity values for inhalation exposure and cancer endpoints could not be estimated for PFBS (USEPA 2021a).

HFPO-DA (GenX): USEPA's Office of Water released "Human Health Toxicity Value for Hexafluoropropylene Oxide (HFPO) Dimer Acid and its Ammonium Salt (CASRN 13252-13-6 and CASRN 62037-80-3), Also Known as "GenX Chemicals,"" in October 2021 (USEPA 2021b). This toxicity assessment provides chronic and subchronic oral RfDs for HFPO-DA (GenX) that are based on liver effects in female mice. Due to a lack of information in the current literature on HFPO-DA (GenX) inhalation toxicity and carcinogenicity, toxicity values for inhalation exposure and cancer endpoints could not be estimated. As such, the USEPA Office of Water found the carcinogenic studies to be inadequate to justify a quantitative assessment for a cancer slope factor, but determined that HFPO-DA (GenX) should still be classified as "suggestive evidence of carcinogenic potential" (USEPA 2021b).

PFOA: The ATSDR released "Toxicological Profile for Perfluoroalkyl Substances" in May 2021 (ATSDR 2021). The ATSDR profile characterizes the toxicologic and adverse health effects

information for various PFAS compounds, including PFOA. Based on these potential health effects, ATSDR developed Minimal Risk Levels (MRLs), an estimate of the daily human exposure to a substance that is likely to be without appreciable risk of adverse noncancer health effects over a specified route and duration of exposure. ATSDR developed MRLs for PFOA, as well as PFOS, PFHxS, and PFNA.

The MRL developed for PFOA is based on a development toxicity study in mice. The critical effect included skeletal alterations at 13 and 17 months of age in the offspring of mice fed a diet containing PFOA on gestation days 1 through 21 (ATSDR 2021).

USEPA's Office of Water also maintains that PFOA should be classified as "suggestive evidence of carcinogenic potential" and estimated an oral cancer slope factor (CSF) based on tumor development in rat testes (USEPA 2016a). Due to a lack of information in the current literature on PFOA inhalation toxicity, toxicity values for inhalation exposure were not estimated for PFOA (USEPA 2016a).

PFOS: ATSDR developed an MRL for PFOS based on a developmental toxicity study in rats. The critical effects included delayed eye opening and decreased pup body weight during lactation in the offspring of rats administered PFOS orally (ATSDR 2021).

PFHxS: ATSDR developed an MRL for PFHxS based on a thyroid toxicity study in rats. The critical effect was thyroid cell proliferation in adult male rats administered PFHxS orally for a minimum of 42 days (ATSDR 2021).

PFNA: ATSDR developed an MRL for PFNA based on a developmental toxicity study in mice. The critical effects were decreased body weight gain and developmental delays in the offspring of mice administered PFNA orally on gestation days 1 through 17 (ATSDR 2021).

2.2.2 California Health-Based Values for PFAS

In California, health-based advisory values for drinking water and screening levels for soil and groundwater have been developed for PFOA and PFOS. In July 2018, the California State Water Resources Control Board (CSWRCB) Division of Drinking Water (DDW) established drinking

water Notification Levels (NLs) of 14 and 13 ppt for PFOS and PFOA, respectively. In August 2019, by recommendation of the State of California Office of Environmental Health Hazard Assessment (OEHHA), DDW lowered the NLs to 6.5 ppt for PFOS and 5.1 ppt for PFOA (CSWRCB 2020a). In setting the recommended NLs, OEHHA developed reference levels for cancer effects based on OEHHA's risk assessment methodology, physiological information obtained from USEPA, and evaluation of recent human and animal toxicity data (California Environmental Protection Agency 2019). On February 6, 2020, DDW issued updated drinking water response levels (RLs) of 10 ppt for PFOA and 40 ppt for PFOS based on a running four-quarter average. On March 5, 2021, DDW issued a drinking water NL and RL of 0.5 parts per billion (ppb) and 5 ppb, respectively, for PFBS. These NLs are non-regulatory, health-based advisory levels for contaminants in drinking water for which no Maximum Contaminant Levels (MCLs) have been established. NLs are associated with notification requirements for drinking water system (San Francisco Bay Regional Water Quality Control Board [Regional Water Board] 2020). Variability in PFAS screening criteria/levels exists among various states because each regulatory agency may have selected different toxicological studies, identified a different toxicological effect (e.g., liver, immunological), chosen a different sensitive receptor (e.g., lactating woman, residential child), applied different uncertainty factors, or incorporated a relative source contribution (i.e., accounting for a receptor receiving PFAS from other sources).

Section 2.3 presents the screening levels, methodology, and rationale for selecting them for this SI Report.

2.3 PFAS SCREENING LEVELS AND DATA EVALUATION

The regulatory status of PFAS is very dynamic. Some states have adopted the 2016 USEPA lifetime HA level for PFOA and PFOS as drinking water targets; however, with USEPA's release of new interim lifetime drinking water HAs for PFOA and PFOS that are orders of magnitude below standard laboratory detection limits, the interim HAs currently are not attainable targets. Other states such as California have developed or are deriving their own regulatory or guidance/screening values for PFOA and PFOS as well as other PFAS.

USEPA's RSLs were used to evaluate PFAS concentrations for this SI and are listed in Table 2-1. As previously discussed, there are RSLs for six PFAS: PFOA, PFOS, PFBS, PFNA, PFHxS, and HFPO-DA (GenX). The following sections discuss the methodologies applied to derive the screening levels and the uncertainty involved.

Soil Screening Levels

USEPA's RSL Calculator provides an automated approach to develop default and site-specific RSLs for several contaminants. The RSLs generated by the RSL calculator are summarized in the USEPA's RSL table for various media, for exposure by residential and industrial receptors, and for soil levels protective of groundwater. The values listed in the RSL table are based on USEPA's standard default exposure assumptions, conservative default soil parameters (e.g., porosity, fraction of organic carbon) and approved toxicity factors.

The RSL table (USEPA 2022b) includes values for direct contact with soil and soil levels protective of groundwater. The residential RSLs for direct contact with soil corresponding to an HQ of 0.1 are as follows:

- PFOA –19 micrograms per kilogram (µg/kg)
- PFOS – 13 µg/kg
- PFNA – 19 µg/kg
- PFBS – 1,900 µg/kg
- PFHxS – 130 µg/kg
- HFPO-DA (GenX) – 23 µg/kg.

The direct contact screening values for PFBS are one to two orders of magnitude greater than those for other five PFAS. The values for PFBS are also orders of magnitude greater than the background values in the Zhu et al. study (2019). Note that a soil screening level for the carcinogenic effects of PFOA can be derived based on an individual's excess lifetime cancer risk of one-in-a-million. However, the screening level for non-carcinogenic effects is more conservative than the one derived for carcinogenic effects.

Soil levels protective of groundwater are as follows:

- PFOA – 0.091 µg/kg
- PFOS – 0.0038 µg/kg
- PFNA – 0.025 µg/kg
- PFBS – 0.019 µg/kg
- PFHxS – 0.017 µg/kg.

Soil levels derived for protection of groundwater are lower than the analytical method detection limits for measuring PFOS, PFOA, PFNA, PFBS, and PFHxS in soil. A soil level protective of groundwater cannot be calculated for HFPO-DA due to unavailability of an organic carbon partition coefficient. Soil levels protective of groundwater are also less than the background ranges for PFOA, PFOS, and PFBS in the Zhu et al. study (2019), described later in this section.

This report also includes the CSWRCB and Regional Water Board Interim Environmental Screening Levels (ESLs) for soil. For direct human health exposure, the ESLs for PFOA and PFOS are 3.8 and 12 µg/kg, respectively. For terrestrial habitat, the ESLs for PFOA and PFOS are 84 and 13 µg/kg, respectively (Regional Water Board 2020).

Groundwater Screening Levels

PFAS concentrations in groundwater were screened by use of USEPA tapwater RSLs (USEPA 2022b). Tapwater RSLs for direct contact with groundwater (assuming it is a potable source) corresponding to an HQ of 0.1 are as follows:

- PFOA – 6 ng/L
- PFOS – 4 ng/L
- PFNA – 5.9 ng/L
- PFBS – 600 ng/L
- PFHxS – 39 ng/L
- HFPO-DA (GenX) – 6 ng/L.

This report also includes the CSWRCB and Regional Water Board Interim ESLs for groundwater. For direct human health exposure, the ESLs for PFOA and PFOS are 5.1 and 6.5 ng/L, respectively.

Screening Levels for Other Environmental Media

Currently, USEPA screening levels are not available for surface water, but these can be derived with the RSL calculator for the six PFAS included in the calculator based on site-specific scenarios. This could be done as part of further PFAS evaluation. Therefore, surface water data collected during the SI are only presented in this report, but not compared to any screening levels.

There are also no USEPA screening levels for effluent from water treatment systems. For evaluation purposes only, the USEPA groundwater screening levels were used to screen the PFOS, PFOA, PFBS, PFHxS, PFNA, and HFPO-DA effluent data.

Ecological Screening Criteria

USEPA has not established any PFAS ecological screening criteria. There are also limited surface soil, sediment, and surface water ecological values available for comparisons. The CSWRCB Interim ESLs for soil include terrestrial habitat ESLs of 84 and 13 µg/kg for PFOA and PFOS, respectively (CSWRCB 2020a).

Uncertainty Analysis of the Soil to Groundwater Pathway

Soil screening levels (SSLs) protective of groundwater are presented in the RSL Tables (USEPA 2022b) for the six PFAS (PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA). These SSLs are designed for use during the early stages of a site evaluation when information on soil conditions may be limited. Hence, the equation's input assumptions about release and transport of contaminants in the subsurface are conservatively estimated. The equation accounts for release of the contaminant in soil leachate, which is then transported through the subsurface soil and aquifer to a receptor well (USEPA 2022c). Detailed, site-specific data for fraction of organic carbon in soil, soil porosity, soil density, depth to groundwater, groundwater flow, distance to receptor, and determination of an appropriate dilution-attenuation factor would significantly influence and refine the soil level protective of groundwater.

Organic carbon partition coefficients serve as useful parameters for evaluating transport. However, they do not capture the impact of electrostatic interactions of PFAS with the soil, meaning that retardation estimates of PFAS transport may be underestimated. A study by Barzen-Hansen et al.

(2017) showed a general level of correlation between PFAS organic carbon partition coefficients and various soil parameters. However, soil type and the nature of organic carbon also influence PFAS sorption to soil. Lab-based sorption coefficient values (K_d) would underestimate the impact of sorption. Along with soil type, pH can strongly influence sorption. Decrease in pH can enhance sorption of specific PFAS. Conversely, increased levels of multivalent cations (e.g., calcium) can lead to increased partitioning (Higgins and Luthy 2006).

In addition to fate and transport uncertainties incorporated in the soil to groundwater pathway assessment, there are significant uncertainties in the toxicity values included in deriving the groundwater targets for this pathway assessment. Toxicity values (e.g., reference doses) needed for use in human health risk assessment are generally derived by reviewing available dose-response data in animals or humans, selecting a dose to serve as a point of departure in the data that is judged most suitable, and adjusting for associated uncertainties. Often, multiple data sets are available, and there may be a variety of options for deriving the toxicity values. In addition, there are a variety of options for fitting the data and selecting and applying uncertainty factors. For these reasons, sometimes several alternative toxicity factors may be available from different sources for a specified chemical.

Widespread use of PFAS in commercial products and industrial processes (including application of biosolids on farmland) potentially has rendered presence of PFAS compounds ubiquitous in the environment. Therefore, uncertainty exists regarding understanding of actual background levels of PFAS in the environment. No PFAS soil background study has occurred in California; however, studies have been conducted in other states. For example, the Vermont Department of Environmental Conservation (VTDEC) performed a background study in surface soil throughout the State of Vermont (Zhu et al. 2019). The background threshold values (calculated excluding outliers), represented by the 95 percent upper tolerance limit, are 3.4, 1.6, and 0.59 µg/kg for PFOS, PFOA, and PFBS, respectively. These background values will not be used to evaluate the data in this SI and are provided only for context and understanding of the uncertainty regarding potential presence of PFAS due to general anthropogenic sources.

Table 2-1. PFAS Screening Levels

State / Agency		Federal / USEPA		California Water Board		
Media		Groundwater	Soil	Groundwater	Soil	
Standard		RSL[1]	Residential RSL[1]	MCL Priority ESL[2]	Human Health Resident Cancer Risk ESL[2]	Ecologic Significantly Vegetated Area ESL[2]
Chemical	**CAS No.**	ng/L	µg/kg	ng/L	µg/kg	µg/kg
HFPO-DA	13252-13-6	6	23	NA	NA	NA
PFBS	375-73-5	600	1,900	NA	NA	NA
PFHxS	355-46-4	39	130	NA	NA	NA
PFNA	375-95-1	5.9	19	NA	NA	NA
PFOA	335-67-1	6	19	5.1	3.8	84
PFOS	1763-23-1	4	13	6.5	12	13

Notes:

1 Value cited from EPA Regional Screening Levels Tables, hazard quotient of 0.1 (USEPA 2022b)

2 Value cited from California Water Board/San Francisco Bay Regional Water Quality Control Board Transmittal of Interim Final Environmental Screening Levels (Regional Water Board 2020)

Abbreviations:

ng/L - nanogram per liter
CAS - Chemical Abstracts Service
µg/kg - microgram per kilogram
NA - No value specified in reference document
RSL - Regional Screening Level
USEPA - United States Environmental Protection Agency
ESL - Environmental Screening Level

Chemical Abbreviations:

PFAS - per- and polyfluoroalkyl substances
PFOA - perfluorooctanoic acid
PFOS - perfluorooctane sulfonate
PFBS - perfluorobutanesulfonic acid
PFNA - perfluorononanoic acid
PFHxS - perfluorohexanesulfonic acid
HFPO-DA - hexafluoropropylene oxide dimer acid (Commonly referred to as GenX)

SECTION 3
FACILITY BACKGROUND AND HISTORY

3.1 PHYSICAL SETTING

NASA ARC is at the southern end of San Francisco Bay, approximately 25 miles east of the Pacific Coast. The City of Mountain View is adjacent to the western and southern boundaries of ARC. The eastern and southern boundaries adjoin the City of Sunnyvale. Downtown San Jose is 7 miles southeast, and the City of San Francisco is 32 miles northwest of ARC. Figure 1-1 shows the ARC property boundary.

ARC is one of several centers within NASA, a federal agency. It is an active facility with no plans for closure or transfer. ARC consists of the NASA ARC campus, the former Naval Air Station (NAS) Moffett Field, and a part of the Sunnyvale Golf Course.

3.2 FACILITY HISTORY

NASA ARC is a federal facility owned and operated by NASA. The primary mission of ARC is research and development in the fields of planetary atmospheric entry systems, advanced computing and information technology systems, aero-sciences, air traffic management, astrobiology and life sciences, cost-effective space missions, intelligent and adaptive systems, and space and earth science.

Before 1933, the area occupied by ARC was mostly farmland. In 1933, the Moffett Federal Airfield (MFA) was commissioned as NAS Sunnyvale to support the West Coast dirigibles of the U.S. Department of the Navy's (Navy) lighter-than-air (LTA) program. The station was transferred to the U.S. Army Air Corps for use as a training base in 1935.

In 1939, the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics was established west of NAS. It consisted of wind tunnels, hangars, aircraft operations, and other research facilities.

In 1942, NAS was returned to Navy control and renamed NAS Moffett Field. At that time, the heavier-than-air (HTA) program was initiated and began to take precedence over the LTA program.

In 1945, the HTA program was moved to another facility, and NAS Moffett Field was used as a major overhaul and repair base. The LTA program was discontinued at NAS Moffett Field in 1947. In 1949, the station became home to the Military Air Transport Service Squadron.

By 1950, NAS Moffett Field was the largest naval air transport base on the West Coast and became the first all-weather NAS. NAS Moffett Field became headquarters for the Commander Patrol Wings of the U.S. Pacific Fleet in 1973. NAS Moffett Field supported anti-submarine warfare training and patrol squadrons. The station supported more than 70 tenant units, including the Commander Patrol Wings, U.S. Pacific Fleet, and CANG. No heavy manufacturing or major aircraft maintenance was conducted at NAS Moffett Field, but a significant amount of unit- and intermediate-level maintenance occurred.

In July 1994, all active Navy military operations at NAS Moffett Field ended when the base was transferred to NASA and renamed MFA. NAS Moffett Field was closed in response to the Base Realignment and Closure (BRAC) program. Stewardship of the MFA and a portion of the adjoining Sunnyvale Golf Course were transferred to ARC. The military housing portion was retained by DoD during the transfer, and the United States Air Force (Air Force) took charge. The Air Force later transferred military housing to the U.S. Department of the Army.

In 2014, Alphabet Inc.'s subsidiary, Planetary Ventures LLC (PV) signed a 60-year MFA lease agreement for the PV Bay View Lease Area, and the Moffett Federal Airfield Lease Area. The lease includes restoration of Hangar 1, rehabilitation of Hangars 2 and 3, and property development associated with research, development, assembly, and testing in the areas of space exploration, aviation, rover and robotics, and other emerging technologies (NASA 2014).

The CANG 129th Aerospace Rescue and Recovery Group has been at Moffett Field since 1984. Its mission is to conduct combat search and rescue operations on a global scale (CANG 2004).

3.3 RESTORATION PROGRAM AT ARC

Numerous investigations of potential sources of soil and groundwater contamination have been performed at ARC. In the early 1990s, NASA developed and implemented the NASA Ames Research Center-wide Sampling and Analysis Program for systematic evaluation of potential soil

and groundwater impacts at ARC. As part of this program and subsequent investigations, 16 AOIs were identified at ARC. Some of the AOIs with underground storage tanks (UST) or aboveground storage tanks (AST) are addressed under other regulatory programs (Earth Resources Technology, Inc. [ERT] 2019a).

Some PFAS sampling activities have occurred at ARC prior to this SI, which are further discussed under Section 3.6 and results are included in Appendix B, as received. The following subsections overview other remediation activities and groundwater contaminants investigated over the years at ARC.

3.3.1 Navy Installation Restoration Sites

Under the BRAC program, the DoD began an IR site investigation to address releases of wastes. Since the early 1930s, wastes had been generated at Moffett Field through maintenance operations, fuel management, and fire training. Disposed chemicals included waste oils and jet fuels; solvents, cleaners, and washing compounds; and lesser amounts of gasoline, hydraulic fluids, asbestos, paints, pesticides, battery acid, and polychlorinated biphenyls (PCBs). Disposal of wastes occurred in unlined landfills, drainage ditches, and unpaved areas in the Stormwater Retention Pond (SWRP) and in an unlined wastewater pond. Other waste disposal areas included underground tanks and sumps (all now removed) that contained petroleum hydrocarbons, and fuels and wastewater contaminated with oils and solvents (Tetra Tech 1997).

In accordance with the Navy – NASA Memorandum of Agreement (MOU) dated April 6, 2017, the Navy retains lead agency responsibility for two IR sites: Site 26 – East-Side Aquifers Treatment System (EATS) (IR 26), and Site 28 – West-Side Aquifers Treatment System (WATS) (IR 28) – where NASA is performing operations and maintenance, and the DoD is investigating vapor intrusion and the Traffic Island portion.

By October 2015, 21 IR sites had achieved regulatory closure. NASA agreed under the Federal Facility Agreement (FFA) to accept lead agency responsibility for the Site 29 – Hangar 1 (IR Site 29), and responsibility for implementation of land use controls (LUCs) as Property Owner of Site 1 – Runway Landfill (IR Site 1) and Site 22 – Landfill (IR Site 22). As lead agency, NASA accepted responsibility for all current and future CERCLA actions. As of October 1, 2021, the Navy is the

Lead Agency for Site 26, but NASA performs long-term monitoring. These responsibilities are incorporated into the annual Fiscal Year 2020 Site Management Plan for the ARC FFA (ERT 2019a).

Further discussion about the groundwater plumes at ARC corresponding to EATS and WATS follows.

3.3.2 Middlefield-Ellis-Whisman Regional Plume

South of ARC, historical land use across U.S. Highway 101 was agricultural. Orchards, row crops, and greenhouse gardening dominated the area. During the 1960s and 1970s, commercial and light industrial development began, and several industrial companies conducted semiconductor, electronics, and other manufacturing and research in the area bounded by four roads: East Middlefield Road (M), Ellis Street (E), North Whisman Road (W), and U.S. Highway 101 (USEPA 2019). This area is commonly called Middlefield-Ellis-Whisman, or MEW.

Within the MEW area, companies involved in manufacture of silicon chips and semiconductors, along with metal finishing operations, parts cleaning, aircraft maintenance, aerospace research and development, and missile construction, discharged trichloroethene (TCE) and other contaminants to groundwater (USEPA 2004). As groundwater flowed northward from the MEW area toward ARC and San Francisco Bay, the discharges created a TCE plume that extended onto ARC.

The MEW area and plume were listed on the National Priorities List (NPL) as three Superfund sites: Fairchild Semiconductor Corp.–Mountain View Superfund site, Raytheon Company Superfund site, and Intel Corp.–Mountain View Superfund site. These three NPL sites comprise the MEW Superfund Study Area. The MEW companies began extracting and treating groundwater in 1998 (USEPA 2019).

The MEW groundwater plume resulted primarily from off-site, upgradient sources (the MEW Superfund Study Area) and secondarily from previous Navy operations at former NAS Moffett Field.

The commingled groundwater plume on ARC is under remediation pursuant to the 1989 MEW Record of Decision (ROD) issued by USEPA (USEPA 1989) and two subsequent Explanations of

Significant Differences (USEPA 1990, 1996). As described in the MEW ROD, groundwater cleanup includes initial actions, which have been completed, and the current long-term remedial phase that involves groundwater extraction and treatment. The volatile organic compounds (VOCs) addressed in the MEW ROD are assigned to both facility-specific and regional responsibilities. Each of the MEW companies is responsible for investigation, remediation, and source control of VOCs in soil and groundwater at its facility-specific property south of U.S. Highway 101. The MEW companies are jointly responsible, through the Regional Groundwater Remediation Program (RGRP), for remediation of VOCs in groundwater that have bypassed the source control areas and are not being captured by the facility-specific source control systems or that cannot be attributed to a sole source (USEPA 2004).

NASA is operating WATS (Site 28) and enforcing LUCs and institutional controls (ICs) associated with the MEW regional plume, but is not the lead agency. In accordance with the Navy – NASA MOU dated April 6, 2017, the Navy retains lead agency responsibility.

3.3.3 Orion Park Plume

The Orion Park Plume, possibly associated with the MEW regional plume, is along the western edge of ARC. The Orion Park Plume is named after the Navy's former Orion Park housing area. Several investigations in and around the former Orion Park housing area have concluded that the source of the VOC plume is upgradient of the housing area at an unidentified location (ERT 2019b).

3.3.4 EATS Plume

In addition to the commingled groundwater plume in the WATS area that resulted from former Navy operations, another chlorinated VOC groundwater plume is east of the airfield runways in the area known as EATS.

In 1996, the Navy signed the ROD for Operable Unit (OU) 5 (Navy 1996). The ROD divided OU 5 into northern and southern groundwater contaminant plumes. Groundwater monitoring was the only action required for the northern plume. The remedy selected and implemented for the southern plume at OU 5 included extracting and treating groundwater to drinking water MCLs by EATS,

monitoring groundwater, and implementing ICs to prevent human exposure to or ingestion of contaminated groundwater (Naval Facilities Engineering Command [NAVFAC] 2019).

EATS operated from January 1999 to July 2003. In 2003, EATS was shut down after an efficiency and efficacy evaluation showed that it was not cost effective. In 2014, a ROD amendment selected (1) in situ bio-stimulation and bioaugmentation treatment in the portions of the groundwater plume with highest remaining concentrations of contaminants of concern (COCs), (2) monitored natural attenuation, and (3) ICs (NAVFAC 2019).

In 2017, NASA completed ICs for IR Site 26. On July 27, 2021, the Navy issued a Memo to File for Non-Significant Modification to Final Record of Decision Amendment for IR Site 26 that changed the shape of the LUC area for Site 26. Additionally, the Navy submitted and USEPA approved an Interim Remedial Action Completion Report (IRACR) changing the remaining remedy to long-term monitoring until monitored natural attenuation results would indicate achievement of the cleanup standards (Navy 2021).

3.4 GEOLOGIC AND HYDROGEOLOGIC SETTING

Bedrock at NASA ARC is composed of Franciscan sediments encountered in boreholes at 1,370 feet below ground surface [bgs]. The Franciscan Formation is overlain unconformably by the Santa Clara Formation, which consists of clays and gravelly sand aquifers. The Santa Clara Formation aquifers are the South Bay's primary domestic water source. A thick sequence of fine-grained, older alluvial deposits caps the Santa Clara Formation and serves as an aquitard that separates it from younger, shallower water-bearing alluvial sands and interbedded clays. Although not used for drinking water, the shallow aquifer is directly below NASA ARC and extends to about 240 feet bgs.

The young alluvium has been separated into four discrete units. Only three of the four units have been mapped on the site: coarse-grained alluvium (Qhac), medium-grained alluvium (Qham), and fine-grained alluvium (Qhaf). Both the coarse- and medium-grained alluvium represent deposition at the distal end of alluvial fans. These deposits are interfingered with fine-grained sediments deposited by San Francisco Bay. Vertical transmission of groundwater and associated contaminants is augmented by increasing vertical continuity among the interspersed sands. The entire sequence is covered by about 5 feet of bay mud or artificial fill.

3.5 HYDROLOGICAL SETTING

ARC lies within the Santa Clara Valley, which is a long, narrow trough and a coastal watershed that borders San Francisco Bay. The basin is composed of gently sloping topography of interbedded alluvial fans that combine to form the valley floor and coastal lowlands. Figure 3-1 shows the sloping topography from the south to the Bay. General geologic materials consist of coarse-grained stream channel deposits (sands and gravels) and fine-grained deposits (clays and silts) that are adjacent to the channel deposits. The lateral extent of the coarse-grained deposits is often discontinuous and cut off by the finer-grained materials.

Three major bodies of surface water are near ARC: San Francisco Bay, Stevens Creek, and former salt-evaporation ponds managed by the United States Fish and Wildlife Service (USFWS). The former salt-evaporation ponds encompass several square miles at the southern end of the San Francisco Bay between Guadalupe Slough and Alviso Slough. Stevens Creek flows northward from the foothills of the Santa Cruz Mountains and along the western edge of ARC before discharging into San Francisco Bay.

The former salt-evaporation ponds are enclosed by levees and do not undergo changes in water level resulting from tidal fluctuations or local stream runoff. Evaporation pond water levels may, however, be affected by upward flow of groundwater from shallow aquifer zones.

ARC is situated along wetlands adjacent to San Francisco Bay and within the stormwater retention ponds. The facility has approximately 10,000 feet of wetland frontage along its north end. ARC houses both resident and migratory birds. Feeding areas include the wetlands north of the facility and the former saltwater evaporation ponds. Numerous species of terns, gulls, and wading birds are known to use the area for feeding and nesting (Tetra Tech 1994).

3.5.1 Groundwater

The shallow aquifer (the upper 240 feet) is subdivided into the A, B, and C aquifers. The upper (A and B aquifers) and lower (C aquifer) are separated by a laterally extensive clay aquitard (B/C aquitard) that effectively isolates the C aquifer (approximately 150 to 240 feet bgs) from the

upper aquifers. The upper aquifer is designated as a potential drinking water source. No water is pumped from the upper aquifer for drinking water use.

The A Zone is subdivided into two subzones (A1 and A2 aquifers), and the B Zone is separated into three subzones (B1, B2, and B3 aquifers). The A/B aquitard, which separates the A and B aquifers, may be locally discontinuous, so the A2/B1 zone is generally considered to be a single unit. Groundwater monitoring, pumping, and remediation of dissolved chlorinated solvents occur in both the A1 and A2/B1 aquifers on the west side of ARC within the MEW plume. Pumping of these hydraulically connected shallow aquifers may have resulted in groundwater mixing.

The A aquifer extends to an estimated depth of 65 feet bgs at ARC. Stringer-like historical alluvial channel deposits composed of sand and gravel constitute the permeable portion of the A aquifer. These historical channel deposits are embedded in silt and clay over-bank deposits, which are of low permeability, and provide complex, discontinuous, and tortuous pathways for contaminant transport. The channels generally are oriented in the north-south direction. The A aquifer is divided into the A1 and A2 aquifer zones by a discontinuous, low-permeability horizon (A1/A2 aquitard) located approximately between 22 and 29 feet bgs; this is based on lithologic logs, which show groundwater flow in the hydraulically-connected, unconfined A1/A2 aquifer.

As in most aquifers with alluvial channel deposits, these channel deposits provide lateral preferential flow paths through the aquifer, and most groundwater that flows through the A aquifer at NASA ARC likely passes through these deposits. The low permeability of the adjacent deposits and clay and silt alluvium limits groundwater flow through these units and creates lateral flow boundaries.

Local recharge to the shallow aquifers occurs from infiltration of stormwater in unpaved areas, leakage from unlined ditches and canals, infiltration from French drain systems, and leakage from stormwater drain corridors. Groundwater flow direction is generally from south to north in the western part of NASA ARC, and is deflected to the northeast where it is becomes influenced by underground drainage pipes that ultimately discharge north to the evaporation ponds and San Francisco Bay.

3.5.2 Stormwater

Stormwater from ARC is drained by two separate drainage areas. A drainage boundary runs south to northwest of the paved runways. Stormwater from the eastern drainage area, including the airfield runways and all land east of the runways, discharges directly or indirectly to the Building 191 pumping station. The stormwater pipe and trench also act as a groundwater drain along its corridor to the pumping station, which is evident by the upgradient deflection of groundwater elevation contours along the pipe. Building 191 pumps discharge water from the North Patrol Road Ditch into the Northern Channel. The stormwater then flows through a series of channels, including the Sunnyvale West Flood Control Channel and the Moffett Channel, to the Guadalupe Slough and eventually the San Francisco Bay. For the areas east of the runways, Hangar 2, Hangar 3, and EATS, stormwater flows into the Marriage Road ditch first and then flows to the North Patrol Road Ditch before entering the Building 191 pump station.

Stormwater from the western drainage area, including most of the area west of the runways, discharges to the Stormwater Settling Basin (SWSB). Overflow from SWSB spills onto the diked wetland area north of the basin known as the EDM and then flows to the Perimeter Road outfall structure on an overland flow basis. Three 48-inch storm drainpipes run beneath Perimeter Road to allow drainage of EDM into SWRP, where it evaporates during the dry season.

Two stormwater discharge locations are at ARC: the discharge location of Building 191 and the effluent outlet of SWSB in EDM. Additionally, there are two authorized non-stormwater discharge locations: (1) the combined MEW GWETS and NASA GWETS, and (2) the WATS.

3.6 AOPCs AND ASSOCIATED FACILITIES DESCRIPTIONS

A total of 26 AOPCs were identified during the PA for inspection in the SI. The 26 AOPCs recommended for SI included multiple PFAS source types. These included potential AFFF release areas, landfills, electroplating operations, and water treatment systems. Figure 1-2 shows the AOPC locations.

3.6.1 AOPC 1 – Former Firefighting Training Area (IR 10, 12, 20)

The NASA Fire Department serves as the Fire, Air Crash, and Rescue Station for ARC. Currently, no AFFF firefighting training areas are at ARC. Trainings proceed with propane-lit fires that are extinguished with water only.

Until 2018, AFFF was used for firefighting training. As a part of the annual training exercises, AFFF was discharged onto the runway or the adjacent grassy area. Photos of the 2018 firefighting training showing discharges onto the runway were included in the PAR (Tetra Tech 2021a). Drains on the runways where AFFF was released were closed during training to prevent AFFF from entering stormwater drains. The former firefighting training area includes a part of the IR 10 runways, the former AST area (IR 12), and the Zook Road fuel spill area (IR 20).

Historically and through September 1995, the Navy Fire Department provided services to the base and ARC (Tetra Tech 1994). Between 1995 and 2005, the 129th CANG performed firefighting operations, and within the following year the NASA Fire Department took over operations (NASA 2020a).

At IR 12, the Navy conducted firefighting training on the airfield next to the northwest edge of the runway and north of Hangar 1 within AOPC 1. Two berm pits were used from the 1950s to the 1990s to train firefighters. Before its removal in 1991, a 5,000-gallon AST fuel tank (IR 12) containing waste fuel was 120 feet north of the two pits. Jet propellant (JP)-4, JP-5, and diesel fuel and other chemicals and solvents would be pumped into the pits and set on fire as a training aid. Firefighting chemicals applied to the fires included bromochlorodifluoromethane, potassium bicarbonate, and AFFF (Tetra Tech 1994, NASA 2005a). As a source control measure, contaminated soil from the area surrounding the AST area was removed. Historical aerial photographs show the location of these firefighting training pits, IR 12, and areas of source control excavation. Backfilling efforts included the fire-training pits. Additional aerial photos show that Fire Training Pits 1 and 2 discharged into drainage ditches leading toward the Zook Road fuel spill area (IR 20) (NASA 2005a).

Previous groundwater investigations in IR 12 detected presence of five VOCs, 14 base neutral acids (BNAs), total petroleum hydrocarbons (TPH), oil and grease, and 19 metals. Following removal

action, the AST at IR 12 received closure from the Regional Water Board in 2002 (Regional Water Board 2002).

After the training pits were filled in 1995, the training locations varied from year to year and included several different sections of the runway. Photos from the 2018 firefighting training demonstrated AFFF dispersing onto adjacent downwind areas (Tetra Tech 2021a). The outline of AOPC 1 reflects potential areal coverage of AFFF from annual training exercises from the 1950s to 2018 (NASA 2020b).

Both the runway and Chase Park (IR 10) are south of North Patrol Road. The primary source of AFFF contamination in soil is runway-precipitation runoff that may have carried spilled fuels and lubricants to the surrounding ditches and drains. Groundwater in the area is known to contain chlorinated VOCs from the upgradient MEW site. A 1993 field investigation indicated presence of VOCs, BNAs, and TPHC in the soils in the area; concentrations of nine inorganic compounds exceeded background levels (IT Corporation 1993b).

IR 20, the Zook Road fuel spill area, is approximately 750 feet north of the NASA fuel farm. Contamination of the Zook Road fuel spill site resulted from spills from ASTs that stored off-specification aircraft fuels. Fieldwork conducted in 1992 indicated the presence of petroleum hydrocarbons, including kerosene, motor oil, and diesel. Groundwater samples collected in 1992 did not contain organic compounds (Tetra Tech 1994). A No Further Action (NFA) status for the petroleum fuel and fuel constituents was granted by the Regional Water Board in 2012 (Regional Water Board 2012).

Per the request of the Regional Water Board, ARC performed PFAS testing at the former firefighting training area. Groundwater samples were collected in September 2019 from wells W12-20 and W12-6, downgradient and cross gradient of IR 12, respectively. The samples were analyzed for 24 PFAS analytes via modified USEPA 537 method. Concentrations were higher at the downgradient well. PFOA was detected at 5,540 ng/L at well W12-20 and 457 ng/L at well W12-6; PFOS was detected at 4,090 ng/L at well W12-20 and 2,010 ng/L at well W12-6 (NASA 2019a). At the time of this sampling in 2019, these were the highest concentrations of PFAS in groundwater at ARC.

3.6.2 AOPC 2 – Crash Site (Sunnyvale Golf Course)

AOPC 2 includes four potential PFAS discharge sites: the Sunnyvale Golf Course and three possible off-site sources identified through an Environmental Data Resources, Inc. (EDR) Area Study Report keyword search (EDR 2019).

The Sunnyvale Golf Course is an 18-hole golf course built in 1968 on (then) Navy property south of the runway on the other side of U.S. Highway 101. According to the *New York Times* archive, 11 men aboard a NASA Convair 990 and five Navy personnel aboard a Lockheed P-3C Orion anti-submarine patrol plane died on April 12, 1973, when the two aircraft hit each other in midair, plunged onto the 12th fairway of the golf course, and exploded in flames (*New York Times* 1973). News footage of the event shows AFFF, a known source of PFAS, applied to the wreckage on the unpaved golf course (San Francisco State University 2020).

The EDR Area Study Report keyword search identified Calisolar, California Microwave, and E/M Lubricants as three possible off-site sources for PFAS discharge at AOPC 2 (EDR 2019). These locations were flagged for metal plating or coating operations and were included in the windshield survey. Based on observations during the windshield survey, these three sites no longer have active metal plating or coating operations. Calisolar (later Silicor Materials Inc.), at 985 Almanor Avenue, is the closest to ARC. It was founded in 2006 as a development company with the goal of manufacturing low-cost photovoltaic solar cells from silicon ingots designed for the solar industry instead of electronic grade polysilicon (University of California, Berkeley 2020). Historically, California Microwave manufactured electronic equipment for telecommunication transmissions and distribution and defense applications at 985 Almanor Avenue until 1996. Wastes at California Microwave included solvents and alodine solution. Soil and groundwater were impacted by site operations at 985 Almanor Avenue (CSWRCB 2020b). E/M Lubricants operated a metal coating facility at 875 Maude Avenue, where improper storage and handling of degreasing materials impacted soil and groundwater (CSWRCB 2020c).

3.6.3 AOPC 3 – Hangars 2 and 3 (IR 7)

IR 7 includes Hangars 2 and 3, the facilities around the hangars, and the surrounding paved area. This area is east of the runways and south of Marriage Road ditch. Before construction of Hangars 2

and 3 in 1942, the area was used for agriculture. No AFFF Fire Suppression Systems (FSSs) were installed in Hangars 2 and 3 (Tetra Tech 1994).

Disposal of wastes at IR 7 occurred in the unpaved areas at the corners of each hangar until 1978 when the area was paved. Hazardous wastes disposed of before 1978 included paint, paint strippers, oils, solvents, aviation hydraulic fluids (which may contain PFAS), and chlorinated solvents. VOCs, TPHC, metals, inorganics, and BNAs were COCs detected in the soil and groundwater from these wastes (Tetra Tech 1994). Soil contamination was addressed with removal actions, and groundwater contamination beneath IR 7 was addressed as a part of the EATS area remedy (IR 26 or OU 5) (USEPA 1994). After paving of the areas outside the hangars, portions of Hangar 3 (Building 47) were used by the National Guard for aircraft maintenance when CANG moved to Moffett Field in 1984 (CANG 2004). Since 2014, PV has conducted building rehabilitation of Hangars 2 and 3.

3.6.4 AOPC 4 – Former Engine Test Stand Area (IR 11)

The Engine Test Stand Area is approximately 500 feet north of the intersection of North Patrol Road and Northern Perimeter Road, and lies between the eastern edge of the runway and Devil's Slough. This site, which was used for testing turbine engines, is fenced and covered by a concrete and asphalt pad measuring approximately 200 by 200 feet. The primary source of contamination is runoff from precipitation and pressure washing of the slab, which drains to a grassy area to the south. The RI of this area was completed in 1993 (IT Corporation 1993b). Fieldwork in support of the RI indicated presence of VOCs (principally methylene chloride), BNAs (principally, bis(2-ethylhexyl) phthalate), TPHC, and inorganics. No PCBs were detected at IR 11 (Tetra Tech 1994). USEPA issued an NFA decision regarding soils in the Engine Test Stand Area. The groundwater contamination beneath is addressed as a part of the EATS area (IR 26 or OU 5) (USEPA 1994).

3.6.5 AOPC 5 – Hangar N211 (within AOI 3, formerly AOI 12)

Aircraft Servicing Facility Building N211 has had an active AFFF FSS from the 1940s to now. Currently, Flight Support Facility Building N211 and Building N211A share 2,500 gallons of AFFF among three storage tanks (NASA 2019b). These storage tanks are outside the northwest corner of the building and have secondary containment bladders for AFFF. Building N211 also contains two

small 136-liter AFFF tanks without secondary containment inside the hangar on the north and south walls. These tanks have hoses, are designed for manual use only, and, unlike the other parts of the building's FSS, are not activated by heat sensors.

In 2017, AFFF was switched to shorter chain (C6) AFFF firefighting foams. Phos-Chek 3 percent AFFF MIL-SPEC is the current firefighting foam used. According to the manufacturer, this product meets the intent of the USEPA 2010/2015 PFOA Stewardship Program. The ARC fire department vehicles and trailer also switched to Phos-Chek 3 percent AFFF MIL SPEC in 2017. Notably, NASA's policy also includes investigation of shorter chain PFAS spills.

In 1999, the Building N211 Zone B deluge system toggle released 5,000 gallons of 1 percent AFFF, and approximately 2,500 gallons entered the storm drain system. In 2001, 10 gallons of 1 percent AFFF was released into the storm drain when a contractor tested the FSS and failed to cover all the storm drains. Additionally, four documented releases of 3 percent AFFF by the Building N211 FSS occurred between 2002 and 2005. Approximately 5 to 10 gallons of 3 percent AFFF was released each time into storm drain catch basin 159F at the northwest corner of Building N211 (NASA 2002; 2003; 2005a, b; 2015). Liquids from catch basin 159F flow to the SWSB and EDM, and then to the SWRP. Further discussion of the stormwater system follows with AOPC 11 and AOPC 12.

Alodine, a metal finishing operation, also occurred in Building N211, which included an alodine metal finishing room (Room 163). PFAS were commonly used as a surfactant to control hexavalent chrome air emissions in metal finishing operations. Alodine, also commonly known as chem film, is a chromate conversion coating used to prepare aluminum surfaces for application of architectural metal finishing products. The operation was closed in September 2004 (Integrated Science Solutions, Inc./Science Applications International Corporation [ISSi/SAIC] Team 2005). A spill report indicated that an unknown quantity of chromium-containing release occurred in April 2005 (Santa Clara County Department of Environmental Health 2008).

3.6.6 AOPC 6 – Hangar N248 (AOI 3 East)

Aircraft Servicing Facility Building N248 has had an active AFFF FSS from the 1970s to now with storage tanks totaling 1,600 gallons of capacity (NASA 2019b). These tanks are outside the southwest corner of the building and have secondary containment bladders. Building N248 also has

two small interior 100-gallon AFFF tanks without secondary containment. These small tanks have hoses, are meant for manual use only, and, unlike the other parts of the building's FSS, are not activated by heat sensors. In 2017, AFFF was switched to shorter chain (C6), Phos Chek 3 percent AFFF MIL-SPEC (Tetra Tech 2021a). According to the manufacturer, this product meets the intent of the EPA 2010/2015 PFOA Stewardship Program.

In 1999, 75 gallons of 3 percent AFFF was released when the fire department tested the FSS. A hose was clamped to the edge of the tote with 5 feet of the hose dangling in the tank. When the system was activated, the hose flew out of the tote and discharged the AFFF (NASA 2015). In 2008, the FSS at Building N248 malfunctioned and an unknown amount of water and AFFF were released into Buildings N248 and N248A, the surrounding paved areas, and the storm drain system. After the initial response, residual foam and standing water remained in areas inside and outside of Buildings N248 and N248A. Disposal of the solid matter occurred as solid waste, and water was discharged to vegetated areas (NASA 2017).

3.6.7 AOPC 7 – Fire Department (Building 580)

Building 580 is between Zook Road and the Moffett Field runways, and serves as the Fire, Air Crash, and Rescue Station for the airfield. Historically and through September 1995, the Navy Fire Department maintained three engines, three crash trucks, and one rescue unit. In addition to providing services to the base itself, the Navy Fire Department provided fire services to ARC (Tetra Tech 1994). Between 1995 and 2005, the 129th CANG was responsible for firefighting operations, and within the following year, the NASA Fire Department took over and retained most of the former Air Force firefighters (NASA 2020a). Currently, three AFFF crash trucks and a trailer are parked at the north end of the building. The three fire engines parked at the south end of the station carry only water.

In 2017, AFFF was replaced with shorter chain (C6), Phos Chek 3 percent AFFF MIL-SPEC, which is deemed less harmful to the environment. Currently, AFFF is stored on site in 500-gallon containers at the north end of the building under the vehicle parking bay on a secondary containment pallet. The building has grassy areas stretching along its north and west sides and around its southeast corner.

The building has interior drains in the south and east garages and exterior safe drains that are closed during firefighting trainings, fuel spills, and some storm events.

Before 2017, AFFF and other firefighting protein foams were discharged as a part of an annual test. The areas surrounding Building 580, including the runway and grassy areas, were used for this annual training. In 2000, 300 gallons of 3 percent AFFF was discharged during the routine test of the FSS on an engine in an area where the storm drains were left uncovered (NASA 2015). More information on these firefighting training activities is in the PAR (Tetra Tech 2021a).

For the purposes of further investigation, AOPC 7 will be subsumed into AOPC 1.

3.6.8 AOPC 8 – Site 1 Runway Landfill (IR 1)

Site 1 (or IR 1) is a 14-acre former landfill that lies adjacent to the SWRP and former salt-evaporation ponds. The Site 1 landfill was in operation from 1965 until the late 1970s, and then was used as a pistol range until 1991. The landfill operated as a sanitary landfill and received wastes that included cardboard, lawn clippings, wood waste, and asbestos insulation wrapped in plastic bags. According to civilian and military personnel, the landfill also received domestic refuse, as well as waste from maintenance and military operations such as scrap equipment, paint, solvents, asbestos, jet fuels, and waste oil and materials contaminated with PCBs, which was placed in an excavation pit of approximately 8 to 12 feet below sea level at this site (Tetra Tech 1994).

The ROD for cleanup of Site 1 was signed in 1997. Remediation included transferring waste from the former Site 2 landfill to the unlined Site 1 landfill. A multi-layer cap was installed at this site consisting of lower and upper foundation layers, a low-permeability clay layer, a biotic barrier, and vegetative cover. In 1998, gas vents, a collection trench, a gas vent trench, monitoring wells, and drainage ditches were constructed at Site 1. The landfill is also surrounded by a fence and secured by a locked gate to control access (USEPA 2003a). Groundwater and landfill gas monitoring is performed to monitor the remedy. Responsibility for operation and maintenance and monitoring of the remedy was transferred from the Navy to NASA in 2016 (CSWRCB 2020d). The groundwater gradient in the landfill area is to the south away from the San Francisco Bay (Leidos 2020).

3.6.9 AOPC 9 – Site 2 Former Golf Course Landfill (IR 2)

The former 7-acre golf course landfill is located along the northeastern perimeter of the runway area, surrounded by North Perimeter Road, Macon Road, and North Patrol Road. Reportedly, the landfill received paints, thinners, solvents, lacquer, oil, fuel filters, and sawdust contaminated with transformer oil. Fill and refuse generally extended from 7 feet above mean sea level at the surface to 9 feet below mean sea level. The landfill was used from the 1940s through the early 1960s (Tetra Tech 1994).

As part of the remedy selected for Site 2 in the 1997 OU 1 ROD, wastes from Site 2 were excavated and consolidated into the Site 1 landfill. After excavation, 3 years of quarterly groundwater monitoring from July 1999 to October 2002 demonstrated that groundwater was not adversely impacted. USEPA concurred, and groundwater monitoring was discontinued (USEPA 2003a). Site 2 is considered a clean closure.

3.6.10 AOPC 10 – Site 22 Landfill (IR 22)

Site 22 (IR 22) is a closed landfill at the northeastern corner of former NAS Moffett Field that occupies 9.4 acres in the area beneath current golf course (the Golf Course at Moffett Field) holes 3, 6, and 7. The Site 22 landfill operated from about 1950 to 1967 primarily for disposal of domestic waste. Other wastes sent for disposal at the landfill included scrap equipment, paint, paint thinners, solvents, oil, fuel filters, and sawdust contaminated with PCBs (ERT 2019a).

From 1994 to 1999, the Navy conducted soil and groundwater investigations at Site 22. The investigations determined site COCs to be VOCs, semi-volatile organic compounds (SVOCs), and pesticides. The ROD specified a landfill cap (with biotic barrier), groundwater monitoring, landfill gas monitoring, and LUCs. Construction of the remedy was completed in August 2003 (ERT 2019a).

Groundwater is monitored quarterly for VOCs and SVOCs. There appears to be a groundwater gradient divide at the center of the former landfill area. LUCs consist of maintaining the integrity of the cap and surrounding stormwater drainage, preventing use of site groundwater, restricting residential use of this site, and conducting post-closure maintenance, monitoring, and reporting (ERT 2017).

3.6.11 AOPC 11 – Building 191 Pump Station

The Building 191 pump station, at the western end of both the North Patrol Road Ditch and the parallel Northern Channel, is one of two stormwater discharge locations at ARC. The other stormwater discharge location, SWSB/EDM, will be discussed in Section 3.6.12 (AOPC 12).

Stormwater from the eastern drainage system of ARC, including the airfield runways and areas east of the runways, discharges to Building 191. Stormwater and surface water are pumped out of the Building 191 concrete vault into the eastward-flowing Northern Channel. The Building 191 pump station operates with one main and one auxiliary pump, and the water level dictates whether one or two pumps operate (NASA 2017). The Building 191 pump station was built in 1953 when the Navy extended the length of the runways and filled in the stormwater ditch from the western portion of the base to the Northern Channel. The stormwater from the western side was then diverted by the Navy to what was later known as the SWRP. Stormwater from the runway areas and the eastern side of the facility has been discharged to the Northern Channel by use of the Building 191 pump station since 1953. From the Northern Channel, water flows east to the Moffett Channel through the Guadalupe Slough and then discharges to the southern end of San Francisco Bay. Additionally, groundwater likely is discharging to the Northern Channel at the Building 191 pump station. A horizontal conduit study by the Navy determined that portions of the storm drains may be subject to infiltration of groundwater through cracks and joints in the storm drain pipes. Furthermore, based on the shallow depth of the groundwater surface at the Northern Channel, groundwater is also infiltrating into the storm drain ditches on the eastern side of the base (NASA 2008).

Historically, the EATS plume had a northern plume and a southern plume as shown on the 1994 plume map. The northern plume extended from the middle of the golf course to the northernmost weapons bunker. TCE (at low concentrations) was the only COC; therefore, the ROD required monitoring only for the northern plume (PRC Environmental Management, Inc. [PRC] 1997). The northern plume no longer exists, and the theory is that pumping at Building 191 may have removed the low levels of TCE over the decades (Tetra Tech 2020).

3.6.12 AOPC 12 – Stormwater Settling Basin/Eastern Diked Marsh (within IR 25)

The SWSB is in the northwestern portion of ARC. The SWSB and discharge pipes were constructed in 1992 to collect contaminated sediment before discharge of the water to the SWRP. The SWSB is a concrete basin approximately 100 feet long and 75 feet wide that receives most stormwater drainage from the western portion of ARC, including the areas west of the runways such as Hangar N211 (AOPC 5). Stormwater enters the SWSB from the south, and settled stormwater exits through the effluent outfall at the northern portion of the SWSB into the EDM, which is within IR 25. During periods of heavy rainfall, stormwater may also flow through the SWSB overflow spillway directly into the EDM. Accumulated sediments within the SWSB are removed annually for off-site disposal. Sediments from the surface of the EDM at the two SWSB outfall locations are sampled annually for COCs, including PCBs, dichlorodiphenyltrichloroethane, lead, and zinc. The EDM sediment samples are analyzed for these COCs as part of the annual sediment and sampling reporting required in the FFA.

3.6.13 AOPC 13 – NASA Groundwater Extraction Treatment System

The NASA GWETS is at the corner of North Warehouse Road and H Lane. NASA entered into an agreement with the MEW Superfund Study Area potentially responsible parties (PRPs) (referred to as the MEW PRPs) to address source areas to the MEW regional plume in the northernmost area of ARC. This area is referred to as the NASA Ames Research Center's Groundwater Area of Responsibility to the MEW Regional Plume (AOIs 3, 7, and 9) (ERT 2019a). The NASA GWETS began operations in 2001 and currently treats up to 20 gallons per minute (gpm) of water extracted from A1 aquifer wells NASA-1A and NASA-3A. Groundwater extraction from wells NASA-2A and NASA-4A was suspended in 2009.

At the GWETS, extracted groundwater is pre-filtered by 25-micron bag filters before passing through two 5,000-pound granulated activated carbon (GAC) vessels operated in series. Treated groundwater is either discharged to Stevens Creek in accordance with NASA's National Pollutant Discharge Elimination System (NPDES) permit, or polished in the Building N271 Industrial Wastewater Pretreatment Plant (IWPP) by a reverse osmosis (RO) system before reuse as cooling water for the Arc Jet Complex, the nation's highest-powered arc-heated hyper-thermal test facility.

The NASA groundwater extraction well network captures areas downgradient of documented AFFF releases from AOPCs, including the firefighting training area (IR 12), Hangar N211, and Hangar N248. Unknown is whether GAC can remove all the PFAS from the past AFFF and chrome-plating discharges or any PFAS from off-site sources of the commingled MEW plume. GWETS effluent is discharged to either Stevens Creek, which flows into the Bay, or the reuse pipeline into the Building N271 IWPP discussed as part of AOPC 20.

3.6.14 AOPC 14 – Middlefield-Ellis-Whisman Groundwater Extraction Treatment System

As discussed in Section 3.6.24, a commingled groundwater plume within the central portion of ARC resulted primarily from off-site, upgradient sources (the MEW Superfund Study Area) and from previous Navy operations at former NAS Moffett Field. The MEW companies had been involved in the manufacturing of silicon chips, semiconductors, metal finishing operations, parts cleaning, aircraft maintenance, aerospace research and development, and missile construction (Tetra Tech 1994).

At the MEW GWETS, which began operation in 1998, groundwater is treated by two low-profile air strippers operated in series. Vapor emissions from the primary air stripper are abated by two 4,000-pound vapor-phase carbon vessels in series. Treated groundwater is combined with the NASA GWETS effluent for either reuse on site as cooling water for the Arc Jet Complex, the nation's highest-powered arc-heated hyper-thermal test facility, or discharge to the Stevens Creek outfall under the NPDES general permit CAG912003, Order No. 99-051 (Schlumberger 2019).

Air stripping is not considered an effective method of treatment for PFAS, which suggests that PFAS will pass through the MEW GWETS. Consequently, any PFAS from the commingled plume in the extracted groundwater would either enter the Building N271 RO IWPP before reuse (discussed in Section 3.6.20 for AOPC 20) or would discharge to Stevens Creek, which flows into San Francisco Bay.

3.6.15 AOPC 15 – West-Side Aquifers Treatment System (IR 28)

The WATS is within the Site 28 area, west of Hangar 1 in Building 45A on Cummins Avenue. It began operation in 1998 and is capable of extracting groundwater from six A1 aquifer wells (EA1-1

through EA1-6), three A2/B1 aquifer wells (EA2-1 through EA2-3), and two sumps (Hangar 1 and EV-5), collectively treating water up to a rate of 120 gpm. The WATS remediates groundwater contaminants originating from Navy sources and the commingled MEW regional plume in Site 28. Extracted groundwater is pre-filtered by 25-micron bag filters before treatment via an advanced oxidation process that uses ozone and hydrogen peroxide. Treated water passes through one of two series of two 2,000-pound GAC vessels operating in parallel before discharge to the storm drain, ultimately flowing through the EDM and discharging into the NASA SWRP (ERT 2018).

The WATS well network captures groundwater from the commingled MEW plume, but unknown is whether the WATS can remove all the PFAS from the past AFFF discharges or from off-site sources of the plume.

3.6.16 AOPC 16 – North Patrol Road Ditch (IR 21) and Northern Channel (IR 27)

The North Patrol Road Ditch (IR 21) is a surface drainage feature that carries a portion of the surface stormwater flow from the eastern side of NAS Moffett Field, including the areas east of the runways, Hangar 2 and 3, EATS, and the East Patrol Road Ditch beside the East Patrol Road. Stormwater flows into the Marriage Road ditch first and then flows to the North Patrol Road Ditch before entering the Building 191 pump station to be discharged into the Northern Channel. Reportedly, the North Patrol Road Ditch was used for disposal of waste fluids, including motor oil, transmission fluid, and hydraulic fluids (Tetra Tech 1994). The Northern Channel (IR 27) is at the northern boundary of the eastern portion of ARC. Historically, the channel received stormwater runoff from the entire base. After extension of the runways in the early 1950s, stormwater from the western portion of the base was diverted to the current SWRP. Stormwater from the eastern portion of the base, including the runways and eastern side of Hangar 1, continues to discharge to the Northern Channel through the Building 191 pump station. From the Northern Channel, water flows east to the Moffett Channel through the Guadalupe Slough and then discharges to the southern end of San Francisco Bay.

In 1991, the Navy CERCLA sites were organized into six OUs. OU 6 included wetland areas, stormwater retention ponds, and storm drain channels. Within OU 6, designated as Site 27 were the Northern Channel, Marriage Road ditch, East Patrol Road Ditch beside East Patrol Road, North

Patrol Road Ditch, the berms along the Northern Channel, and a debris pile near the Building 191 pump station. The sediments and soil contained elevated concentrations of chemicals of ecological concern (COECs), including PCBs, pesticides, and metals. Remedial action in 2006 and 2007 involved removal of contaminated sediments from the entire length of the channel. The debris pile and several areas of contaminated soils in the berms of the channel were also removed (NASA 2008). Site 27, which includes the North Patrol Road Ditch and Northern Channel, received closure from USEPA in 2012 (USEPA 2012).

3.6.17 AOPC 17 – Marriage Road Ditch (IR 3)

The Marriage Road ditch (IR 3) is east of the runway and divides the golf course from the northern portion of NAS Moffett Field. According to the 1993 field investigation, approximately 150,000 to 750,000 gallons of volatile organic wastes, including solvents, fuels, detergents, paint strippers, and hydraulic fluids, was released into the ditch from adjacent properties. The primary contaminants are VOCs, including acetone, toluene, methylene chloride, and tetrachloroethene (PCE). BNAs, SVOCs, JP-5 (TPHC), PCBs, and metals were also detected at concentrations above background levels (IT Corporation 1993a).

Within OU 6, the Marriage Road ditch was designated with the Northern Channel as Site 27 (NASA 2008). Saturated soils were completely removed from Site 27 via channel dredging, and USEPA issued a no further action decision (NAVFAC 2019). The groundwater contamination beneath the Marriage Road ditch was addressed as a part of the EATS area (IR 26) (USEPA 1994).

On February 26, 2019, cloudy water was observed in the Marriage Road ditch, and duplicate stormwater samples were collected by PV's contractor, EKI, and NASA's contractor, ERT. PFAS were detected in both sets of samples, and maximum PFOA and PFOS concentrations were 13.5 and 20.0 ng/L, respectively (Vista Analytical Laboratory [Vista] 2019a, b). EKI commented on the possibility that no PFAS-free glassware was available at the time of sampling, and the low concentrations reported may have been from the glassware.

3.6.18 AOPC 18 – Lindbergh Avenue Storm Drain Ditch (AOI 6)

AOPC 18 (AOI 6), the former Lindbergh Avenue storm drain ditch, encompasses a former drainage ditch that paralleled Lindbergh Avenue beginning north of Building N250B and terminating south of North Perimeter Road after passing through a former diversion box location and the culvert outfall at North Perimeter Road. AOI 6 historically included the section of the former open storm drain channel and adjacent exposed soils that began near Building N250B (southern end of AOI 6), paralleled Lindbergh Avenue for approximately 2,000 feet, and terminated at a former diversion box.

Historical aerial photographs show an open, unlined storm drain channel that was used until May 1940. Reportedly, the concrete-lined channel, approximately 18 inches deep and 4 feet wide at the top, was constructed in the mid-1960s and used until its abandonment in 1993. The storm drain channel collected runoff from the areas along McCord Avenue, King Road, and Severyns Avenue, and from the Hangar N211 aircraft ramp, as well as from the western portion of NAS Moffett Field, including Hangar 1. Runoff from ARC and former NAS Moffett Field flowed down the storm drain channel to the diversion box where water could be directed west under Lindbergh Avenue into the EDM and SWRP or east to the former NAS Moffett Field lift station at Building 191, or both.

In the past, the stormwater drainage system also received ARC wastewater containing chemicals and oil. The wastewater consisted primarily of cooling tower water, water containing water treatment chemicals, and wastewater from shop sinks. During the previous few years before abandonment of the storm drain channel in 1993, only local rainwater and stormwater from ARC routinely flowed into the channel. A new storm drain composed of buried concrete pipe was built in early 1993. Thereafter, the former open storm drain channel was abandoned but remained open and unused until its removal in 1994. NASA conducted remediation at AOI 6 in 1994, 1995, 1996, and 2001 for lead and PCBs (Aroclors-1254, -1260, -1262, and -1268), removing the concrete lining and soil to depths extending to 3.5 feet along the entire 2,000-foot length of the ditch (ERT 2019a).

3.6.19 AOPC 19 – Stormwater Retention Pond (within IR 25)

AOPC 19 (IR 25) is at the northwest corner of NAS Moffett Field, encompassing about 230 acres that includes the EDM and SWRP. The western portion of the SWRP (about 54 acres) is now owned by the Midpeninsula Regional Open Space District and is outside the boundary of ARC. Since 1953,

IR 25 has been part of the stormwater management system at NAS Moffett Field. Stormwater from the western portion of this site flows through a settling basin (built in 1991 by NASA Ames Research Center) into the EDM and then through a culvert to the SWRP. The SWRP is surrounded by levees that prevent either entry of tidal water from San Francisco Bay into the pond or discharge of stormwater to the Bay. Stormwater is held in the SWRP until it evaporates (CSWRCB 2020e).

3.6.20 AOPC 20 – Building N271 Industrial Wastewater Pretreatment Plant

Industrial wastewater west of the runway is discharged without pretreatment to the City of Palo Alto under the Industrial Wastewater Discharge Permit 396101. Building N271 houses the RO units for on-site water reuse that has operated from 2013. The treated groundwater from the combined NASA/MEW GWETS is polished at the IWPP with a RO system before reuse in the ARC Jet Complex, the nation's highest-powered arc-heated hyper-thermal test facility. The reused water and the brine from the RO system are discharged to the Palo Alto sanitary sewer (ERT 2018, NASA 2016).

PFAS are not effectively removed by the MEW GWETS air stripper. The NASA GWETS GAC and IWPP RO both are recommended treatment methods for PFAS (ITRC 2018). However, GAC and RO are not currently optimized for PFAS removal. Furthermore, the effluents are not monitored for PFAS so there are no records indicating whether PFAS breakthrough occurs before each GAC unit is replaced or before the RO is regenerated. Consequently, any PFAS from the MEW GWETS or partially treated by the NASA GWETS GAC would enter the RO treatment system and remain untreated before discharging to the sanitary sewer. Also, brine from RO regeneration may contain PFAS, which may require appropriate disposal.

3.6.21 AOPC 21 – Former Industrial Wastewater Surface Impoundments (IR 4)

From 1968 to 1979, industrial wastewater east of the runway discharged without pretreatment to the City of Sunnyvale under the Industrial Wastewater Discharge Permit 1132 (NASA 2005b). The former wastewater impoundments are immediately south of the Marriage Road ditch, south of Macon Road. Before closure, the unlined ponds received approximately 15 million gallons of wastewater from aircraft washing, equipment maintenance, and miscellaneous operations in Hangars 2 and 3. Wastes reportedly included methyl ethyl ketone (MEK), dry cleaning solvent, paint sludge,

paint stripper, Freon-113, TCE, trichloroethane (TCA), carbon remover, ethylene glycol, fuel, and oil. These wastes were discharged into the holding ponds either directly or as components of wastewater. The most significant VOCs included total xylenes, chlorobenzene, toluene, and acetone, with significant concentrations of benzenes, such as 1,2-dichlorobenzene at 230,000 ppb. Concentration of JP-5 (TPHC) ranged from 15 to 6,760 parts per million. Aroclor was detected in one Phase II sample (Tetra Tech 1994). The IR 4 surface impoundments were removed, and soil closure was granted by USEPA as a part of OU 2, east closure. Aquifers located beneath are being addressed as part of OU 5, or IR 26, the EATS area (USEPA 1994).

3.6.22 AOPC 22 – Building N249 Outdoor Aerodynamic Research Facility

The Building N249 Outdoor Aerodynamic Research Facility (OARF) was built in 1969 and upgraded in 1994. It was used for static testing of vertical and/or short take-off and landing (V/STOL) and rotary wing aircrafts, for acoustic testing, and for analysis of aircraft models before testing in the 40- by 80-foot or 80- by 120-foot wind tunnels. OARF is an open-air, concrete-slab test facility with a model mounting test pad, data acquisition equipment, control room, and other necessary support equipment for remote model or aircraft operation. The OARF is currently mothballed (NASA 2012).

3.6.23 AOPC 23 – Hangar 4 (CANG) Building 662

Hangar 4, an open bay hangar east of the runways with adjacent shop space, was constructed in 2002. The hangar is equipped with four FSS underwing cannons. AFFF is stored in one 1,800-gallon AST within secondary containment inside the hangar, and is delivered by a pipe system to the maintenance bay, where it is then delivered through the underwing cannon. Four floor drains within the maintenance bay are connected to a 100,000 gallon- underground overflow tank (UOT). The outflow from the UOT discharges to a municipal sanitary sewer system (BB&E Inc. 2016). These floor drains are connected to another secondary containment system that is triggered when the FSS is turned on, leading the released AFFF into a 1,000-gallon UST instead of the sanitary sewer. More information on Hangar 4 site conditions is in the site visit checklist in the PAR (Tetra Tech 2021a).

The Hangar 4 tenant, CANG, was required by the Air Force to perform a PA in 2016 for PFAS. According to the PA report, recorded releases of AFFF occurred in 2005, 2006, 2007, and 2012. In

2005, an unspecified amount of AFFF was accidently released and likely washed down the sanitary sewer, storm drain, and grassy area beside Hangar 4. In 2006, another accidental release occurred because of a FSS malfunction, discharging 3,000 to 5,000 gallons of 3 percent AFFF to the sanitary sewer and the grassy area southeast of Hangar 4. In 2007, 50 gallons of AFFF was accidentally discharged to the storm drain and sanitary sewer during an FSS test. In 2012, the FSS was accidentally activated, resulting in an AFFF release whereby approximately 80,000 gallons was captured in the hangar secondary containment, 10,000 gallons entered the sanitary sewer, and under 1,000 gallons discharged into the storm drains (NASA 2015, BB&E, Inc. 2016).

PV has been working with CANG to construct new facilities within the CANG Cantonment to move CANG out of buildings leased by PV as a part of their MFA lease agreement. In May 2018, soil and grab groundwater samples were collected as a part of construction of underground utilities and structures; PFAS were found in two (2GWD1/D2 and CANGVHS) of the three soil samples (3GWA13/A2, 2GWD1/D2, and CANGVHS) and all five grab groundwater samples (3GWB2, 3GWA1, 2GWD1, 2GWB1, and 1GW1) (RPS Group, Inc. 2019). Collections of groundwater grab samples had occurred within different depth intervals (7.5 to 12.5, 10 to 15, and 12.5 to 17.5 feet bgs). Maximum concentration of PFOA (560 ng/L) was detected in the groundwater grab sample collected at the downgradient location 3GWA1-12.5-17.5. PFOS was detected at maximum concentration of 80.2 ng/L (and PFOA at 182 ng/L) at the upgradient location 1GW1-7.5-12.5. 1GW1 was the only sample from the 7.5- to 12.5-foot bgs interval and collected less than 0.25 mile from the property boundary to the east and the south where possible off-site sources contributed to PFAS concentrations. No known potential sources of PFAS were in the vicinity of the 1GW1 location, which is southwest of the CANG Cantonment Building 679 (CANG 2020b). Of note, Well PFAS-C was installed approximately 150 feet from Well 1GW1 during the SI to evaluate other nearby AOPCs.

Subsequent site investigation field activities were completed in September 2018 and January 2019, culminating in collection of 18 soil samples, four groundwater samples, and one sediment sample. Samples were analyzed via modified USEPA 537 method for six PFAS (PFBS, perfluoroheptanoic acid [PFHpA], PFHxS, PFNA, PFOS, and PFOA) consistent with Unregulated Contaminant Monitoring Rule (UCMR) 3 (AECOM 2019).

PFAS were present in all media sampled. PFOA was detected in the groundwater at maximum concentration of 580 ng/L and PFOS at maximum concentration of 44 ng/L, both at a downgradient boundary well (MF-BBW-MW01). PFOA was detected in the soil at maximum concentration of 16 µg/kg and PFOS at maximum concentration of 9 µg/kg. The one sediment sample collected from a nearby stormwater catch basin contained PFOA at concentration of 1.9 µg/kg and PFOS at concentration of 2.6 µg/kg (AECOM 2019). Previous results from samples collected around Hangar 4 are shown on Figure 5-3 and Figure 5-16.

Under the Air Force initiative, AFFF was switched to a short chain (C6) Ansulite 3 percent AFFF military specification (MIL-SPEC) foam in August 2018. The AFFF system's switches and heat sensors were being replaced as of February 2020. Approximately 30 employees currently work in the hangar (CANG 2020a).

3.6.24 AOPC 24 – Middlefield-Ellis-Whisman Plume

The commingled MEW VOC plume originated upgradient of ARC. The MEW companies had been involved in activities that required uses of a variety of VOCs that were stored in raw product and waste forms at facilities within the MEW Superfund Study Area (Tetra Tech 1994). The MEW companies no longer operate in the area.

Another possible off-site source identified through the EDR (2019) Area Study Report keyword search is Technitron, at 630 National Avenue within the MEW plume and flagged for metal plating or coating operations. Currently, the building is vacant. Further information from the windshield survey is documented in the PAR (Tetra Tech 2021a).

The primary COCs, TCE, and other VOCs in the MEW plume are partly attributable to the former semiconductor manufacturing and metal finishing operations at these MEW sites. Because use of PFAS is also associated with the semiconductor manufacturing and metal finishing operations, AOPC 24 is likely to be an off-site source of PFAS and is upgradient of NASA property (CSWRCB 2019a).

3.6.25 AOPC 25 – Orion Park Plume

The Orion Park VOC Plume located along the western property boundary is named after the Navy's former Orion Park housing area. Several investigations for VOCs in and around the former Orion Park housing area by NASA, DoD, and USEPA concluded that the source of the plume is upgradient of the housing area at an undefined location. To mitigate plume migration onto ARC, NASA voluntarily installed an air sparge and soil-vapor extraction (AS/SVE) barrier along the property boundary to remove VOCs. As PFAS are not volatile, the AS/SVE system would not have been effective in removing PFAS entering ARC. The AS/SVE system operated between 2008 and 2019 when it was shut down because it was no longer cost effective at removing the declined VOC mass in the groundwater plume. NASA continues to monitor the extent and magnitude of VOCs in the Orion Park Plume (ERT 2019b).

A possible off-site source of PFAS identified through the EDR (2019) Area Study Report keyword search was Innerconn Technologies at 327 Moffett Boulevard, which was flagged for metal plating or coating operations and included in the windshield survey. The site is currently a strip mall and no longer has active metal plating or coating operations (Tetra Tech 2021a). The site was used for research, development, and manufacturing of electronic components between 1959 and 1983 by Rheem Semiconductor Corporation, Raytheon (or its subsidiaries), and Innerconn. In 1989, the Regional Water Board issued a site cleanup requirement (SCR) for VOC contamination in the shallow groundwater. Contaminated soil was excavated, and groundwater extraction and treatment continued until 2001. The SCR was rescinded in 2007 after monitoring data demonstrated natural attenuation for TCE was 54 µg/L, below the environmental screening level of aquatic habitat (360 µg/L) and vapor intrusion (530 µg/L) (Regional Water Board 2007).

To date, the source for the Orion Park Plume has not been identified. At least one upgradient metal finishing operation may have contributed to the plume. Because use of PFAS is associated with metal finishing operations, AOPC 25 is likely to have an off-site source of PFAS that is upgradient of NASA property.

3.6.26 AOPC 26 – Eastern Boundary (IR 5)

AOPC 26, formerly entitled Lockheed Martin in the SIWP (Appendix A), now consists of two potential PFAS source areas: Lockheed Martin and IR Site 5.

Lockheed Martin: Lockheed Martin owns and operates the aerospace research and fabrication facility at 1111 Lockheed Martin Way, east of and adjacent to the NAS Moffett Field eastern property line. This facility is known as the Plant One Site.

Before 1956, the site location was farmland. Emplacement of the first Lockheed Martin facilities began in 1956 with construction of Building 103. Manufacturing operations began in 1958. By 1963, most of the Lockheed Martin manufacturing and chemical processing facilities were in place. The site covers about 660 acres and historically included about 35 large buildings and structures used as research, testing, manufacturing, laboratory, and office facilities.

In 1982, Lockheed Martin began operation of the Process Water Treatment and Reclamation Facility at the northeastern corner of this site to manage wastewater generated during fabrication and finishing of metal parts. This operation consisted of a treatment unit, two double-lined holding ponds covering 3 acres total, and two double-lined evaporation ponds covering 2 to 3 acres total. The evaporation ponds were used to store and condense concentrated acids, alkali, neutral salt baths, and other cleaning, pickling, plating, etching, and anodizing agents before off-site disposal (CSWRCB 2019b). In January 1987, Lockheed Martin presented the Regional Water Board with information that identified chlorinated and fluorinated VOCs, hexavalent chromium (Cr^{6+}), and elevated nitrate (NO_3) impacts on shallow groundwater beneath the site (Regional Water Board 2000).

The Lockheed Martin site is identified as a potential PFAS source because of historical metal finishing operations and presence of hexavalent chromium in the shallow groundwater, both of which are associated with potential sources of PFAS. Data are limited regarding potentiometric surface elevation and potential PFAS sources along the ARC eastern property boundary.

Monitoring data acquired by the Navy and Lockheed Martin suggest an unconfined aquifer divide along or east of the NASA property line. The potentiometric surface map in the Navy's Annual Groundwater Monitoring Reports suggest that groundwater from near the property line in the

unconfined aquifer flows north and northwesterly toward Building 191 (Navy 2017). The potentiometric surface map of Lockheed Martin's Plant One Site suggests that groundwater flows northeasterly from the property line toward the Bay (Cameron-Cole, LLC 2019). These two potentiometric maps provide evidence of a groundwater divide, with some groundwater from Lockheed Martin's property flowing toward the eastern boundary of NASA.

IR Site 5: IR 5 is located on the eastern side of NAS Moffett Field. The area is former petroleum-product fuel farm that hosted 15 USTs, six ASTs, and an oil-water separator (Tetra Tech 1994). Four of the large USTs were used to store jet fuel. Previous investigations found that subsurface soils and groundwater at IR 5 were contaminated by disposal of fuel/water mixtures in dry wells, along with possible leaking USTs and fuel spills (PRC 1996).

The dry wells were excavated and removed in 2001, and the Navy installed groundwater monitoring wells on the site that were sampled quarterly in 2002 and 2003. Total petroleum hydrocarbons (TPH), Benzene, Ethylbenzene, Toluene and Xylenes (BTEX), and Polycyclic Aromatic Hydrocarbon (PAH) were not detected in groundwater by the time of the final sampling event in 2003. Shallow soil samples were collected at IR 5 in 2009 and TPH and PAH concentrations were below cleanup standards, while BTEX was not detected. An NFA letter for the IR 5 North Fuel Farm Dry Wells was transmitted by the Regional Water Board in 2011 (Regional Water Board 2011).

At IR 5, investigations and removal actions have continued for remainder of contamination at the fuel farm until the present day. An NFA letter from the Regional Water Board for the remainder of the fuel farm is anticipated in 2022 or 2023.

3.7 CONCEPTUAL SITE MODEL

The purpose of a CSM is to identify how contaminants may move in the environment and to establish possible pathways of exposure to human or ecological receptors from contaminated media (soil, water, etc.). The CSM establishes the following:

- Site sources of contamination
- Contaminant release mechanisms and transport/migration pathways
- Exposure routes

- Potential receptors.

This information is necessary to determine possible exposure pathways. Components of the CSM for the sites are discussed below.

3.7.1 Site Sources of PFAS

Potential sources of PFAS at the following 24 AOPCs are known or suspected locations of AFFF release, landfills, effluent from water treatment systems or other non-AFFF sources at NASA ARC:

- **AFFF release sites:** PFAS from AFFF as the primary source at 12 AOPCs, resulting from:
    - AFFF use or release resulting from firefighting training (AOPCs 1 and 7)
    - Aircraft crashes (AOPC 2)
    - Accidental AFFF discharges at three hangars (AOPCs 5, 6, and 23),
    - AFFF use and releases into four stormwater ditches and systems (AOPCs 11, 12, 17, and 18)
    - NPDES stormwater discharge points (AOPCs 16 and 19)
- **Landfills:** Three former unlined landfills at AOPCs 8, 9, and 10.
- **Effluent from water treatment systems:** Three groundwater extraction systems that treat VOCs potentially commingled with PFAS (AOPCs 13, 14, and 15).
- **Non-AFFF sources with potential PFAS release:**
    - Five non-AFFF sources resulting from hydraulic fluid disposal or related use at four sites (AOPCs 3, 4, 21, and 22)
    - Brine from an industrial wastewater pretreatment plant (IWPP) (AOPC 20)
    - Fuel/water disposal, fuel spills, and leaking USTs (AOPC 26)

Two additional off-site AOPCs as well as AOPC 26 were identified as potential contributing sources of PFAS from upgradient industrial activities:

- AOPC 24 – MEW Plume
- AOPC 25 – Orion Park Plume
- AOPC 26 –Eastern Boundary, beside Lockheed Martin.

3.7.2 Transportation and Migration Pathways

Potential migration pathways at the identified areas, include the following:

- Migration of PFAS from known or possible historical AFFF usage or release to surface soils.

Incidents, trainings, and testing involving use of AFFF may have released PFAS to the environment. If PFAS were released to surface soil, the following migration pathways potentially would affect current conditions:

- Downward migration of contaminants from surface soil to subsurface soils via infiltration
- Downward migration of contaminants in soil to groundwater via infiltration
- Migration of contaminants in groundwater
- Migration of contaminants from groundwater or surface water into wastewater sewers
- Migration of contaminants to surface water and sediment from runoff, erosion, and effluent.

Suspected PFAS source areas are present in and around the main ARC campus. These areas may receive drainage and runoff from nearby runways, taxiways, and ramp areas during precipitation events. Therefore, stormwater outfalls, surface water, sediment, and wastewater may have been impacted by surficial runoff. The network of underground utilities may also act as conduits to convey groundwater containing PFAS.

3.7.3 Exposure Routes

PFAS are known to have been released or possibly could have been released to on-site soil and groundwater at 26 AOPCs. Potential for complete exposure pathways with ARC PFAS releases is low because NASA has imposed ICs preventing domestic use of shallow groundwater, including the two existing TCE groundwater plumes (EATS and MEW), and a VOC groundwater plume (Orion Park) that might contain PFAS. Also, an extensive aquiclude separates the shallow aquifer from the deeper aquifer. Finally, ARC is adjacent to San Francisco Bay, and there are no downgradient drinking water wells. Currently, NASA does not use the aquifer as a drinking water source and obtains water from an off-site municipal source (San Francisco Public Utilities Commission).

Potential PFAS releases from the eastern drainage area or in the groundwater east of the runways would be extracted by the Building 191 pump station and discharged to the Northern Channel. The North Channel then flows into the Guadalupe Slough and San Francisco Bay. Potential releases from the western drainage area would enter the EDM and then the SWRP, both of which are on the National Wetlands Inventory (NWI). The threatened Western Snowy Plover, threatened Ridgeway's Rail, endangered California Least Tern, and endangered Salt Marsh Harvest Mouse have been observed in the SWRP. Any remaining PFAS in the treated groundwater from the NASA or MEW GWETSs is discharged into Stevens Creek before entering the federally listed wetlands of San Francisco Bay.

PFAS are known to have been released or possibly could have been released to ARC soil at 26 AOPCs; however, many of these AOPCs do not have exposed surface soils. The objective of the SI was to determine whether PFAS are present or absent in on-site surface soil at the specific AOPCs. If PFAS are present at specific AOPCs in exposed surface soil, complete exposure pathways are possible for on-site workers and recreational receptors. In addition, residential exposure pathways could exist for residences of the Wescoat Village at Moffett Field, which is within 200 feet of AOPC 24 (MEW Plume). The long-chain PFAS in AFFF have been replaced, and the AFFF products containing shorter-chain PFAS are stored in tanks with secondary containment in Hangars 4 (CANG), N211, and N248, and at the fire department. On-site workers are at all AOPCs. Since March 2020, other individual departments within ARC have been updating their estimates of on-site workers. The inactive landfills of IR 1 (AOPC 8) and IR 22 (AOPC 10) have engineered covers, which eliminates a complete exposure pathway for workers or golfers who traverse these covers. The other inactive landfill, IR 2 (AOPC 9), had all waste removed and placed in IR 1 as part of a previous CERCLA cleanup effort (see Section 3.6.9).

Section 5 provides analytical results from the SI, and Section 6 offers recommendations and presents conclusions regarding each area.

3.7.4 Potential Receptors

Human Receptors

Current human receptors to be evaluated for potential exposure to media at each site are limited to industrial workers (e.g., NASA employees), maintenance workers, construction workers, visitors, trespassers, and recreational or commercial users of the off-site surface water bodies (e.g., boaters). Exposure includes contact with impacted soil, surface water, and sediment; and ingestion of organisms. Drinking water is not considered an exposure route as drinking water is delivered in pressurized lines from the San Francisco Public Utilities Commission to ARC.

Workers may access the following areas on a daily basis:

- AOPC 2 – Crash Site (Sunnyvale Golf Course)
- AOPC 3 – Hangars 2 & 3
- AOPC 5 – Hangar N211
- AOPC 6 – Hangar N248
- AOPC 7 – Fire Department (Building 580)
- AOPC 10 – Site 22 Landfill
- AOPC 23 – Hangar 4 (CANG) Building 662.

Maintenance workers may access any of the AOPCs periodically. Future construction workers could be exposed at any of the AOPCs if construction activities include land disturbance. If such activities would occur and the media are determined to be contaminated based on findings of this SI, proper engineering controls such as dust suppression and personal protective equipment (PPE) would be used as necessary to limit exposure.

Trespassers are unlikely to access any of the areas because of the level of security on the ARC Campus.

Recreational users have access to the off-site surface water bodies in the Don Edwards San Francisco Bay National Wildlife Refuge, and soils at the Sunnyvale Golf Course. Users may come into contact with surface water and sediment, and could harvest organisms for consumption.

Ecological Receptors

Numerous wetlands are within 15 downstream miles of NASA ARC. ARC has approximately 10,000 feet of wetlands frontage, with most within AOPC 19. These wetlands are on the NWI. The North Patrol Road Ditch and Northern Channel (AOPC 16) also border federally listed wetlands (EDR 2019).

Two federally designated endangered species are known to occur at or near ARC: the Salt Marsh Harvest Mouse and California Least Tern. The threatened Western Snowy Plover and threatened Ridgway's Rail also occur at or near ARC. The Salt Marsh Harvest Mouse, Western Snowy Plover, and Ridgway's Rail have been observed in AOPC 16. The burrowing owl, a California Department of Fish and Wildlife Service Species of Special Concern, is also known to occur at several locations throughout ARC (Tetra Tech 2017).

FIGURE 3-1 SITE TOPOGRAPHY
PFAS SITE INSPECTION FOR AMES RESEARCH CENTER

ARC PFAS SI
Draft
August 2022



PGH:P:\NASA AMES_PFAS_103IG667601(P)\GIS FILES\FROMKEVINMOORE\AMES_NASA\MXD\FIG3-1_TOPO.MXD 8/17/2022

SECTION 4
FIELD ACTIVITIES

Tetra Tech conducted field activities from July 7 to August 18, 2021, which involved collection of samples outlined in the SIWP (Appendix A), but with some exceptions discussed in Section 4.7. Due to lack of surface water at scoped sampling locations during this timeframe, BB&E later sampled surface water (on November 12, 2021) when sufficient precipitation allowed enough water to accumulate for adequate sample collection. Tetra Tech received surface water data for inclusion in this report.

Prior to mobilization, at a kickoff meeting on June 25, 2021, Tetra Tech and NASA reviewed the SIWP and discussed project schedule, logistics, site access, and safety considerations. Coordination activities prior to work included obtaining a utility locate/dig permit request form and locating and marking utilities. A Site-Specific Health and Safety Plan (SSHASP) was submitted to NASA and approved prior to field work. Each member of the field team reviewed and signed the SSHASP, and a health and safety meeting occurred on site during each day of field work to review job hazards.

Because PFAS are present in many consumer products (including some typical sampling equipment) and are widely present in the environment, special precautions were followed to avoid compromising sampling integrity during collection. The methods and protocols applied for collecting and handling PFAS samples, described in Tetra Tech's Standard Operating Procedure (SOP) SA-1.8 (included as Appendix C), were followed to prevent cross-contamination of PFAS from consumer items and field sampling equipment to the samples.

As outlined in the Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plans) (SAP/QAPP) (Tetra Tech 2021b), which was reviewed and approved by USEPA and the Regional Water Board, quality assurance/quality control (QA/QC) samples were collected throughout the duration of the project. These included field reagent blanks (FRBs), matrix spikes (MSs), duplicates, and equipment blanks. These samples were collected at the following rates: FRBs one per day, MS one per 20 samples, duplicates one per 10 samples, and equipment blanks

one per type of non-disposable sampling equipment. A source water blank was also collected from the driller's water source used for equipment decontamination and drilling contact water.

Media proposed for sampling during this SI included soil (surface and subsurface), groundwater (permanent monitoring wells), surface water (stormwater settling basins and stormwater retention pond), and influent/effluent samples at each of four water treatment systems on site. Some modifications occurred during field implementation, which are outlined in Section 4.7. Table 4-1 through Table 4-4 summarize sample locations within each AOPC and in each medium inspected during the SI.

The following subsections provide details of field work during the PFAS SI.

4.1 MONITORING WELL INSTALLATION

Seven monitoring wells (PFAS-A, PFAS-C, PFAS-D, PFAS-E, PFAS-F, PFAS-G, and PFAS-H) were installed at AOPCs 2, 4, and 18 by a California-licensed well driller (Penecore) as part of the inspection. One well scoped for installation at AOPC 3 (PFAS-B) was not installed due to utility and concrete concerns around the hangars (further discussed in Section 4.7). Table 4-5 lists details of the monitoring wells installed. Figure 5-13 shows the location of PFAS-A. Figure 5-5 shows locations of PFAS-C, PFAS-D, PFAS-E, PFAS-F, and PFAS-G. Figure 5-7 shows the location of PFAS-H. Field documentation, including soil boring logs and monitoring well completion forms, are in Appendix D. A photographic log documenting the field inspection is in Appendix E.

Monitoring well installation procedures are described in Section 14.2.5 of the ARC SI SAP/QAPP (Tetra Tech 2021b). All wells were installed via direct-push drilling techniques and constructed with a 2-inch inner diameter (ID), 0.010-inch slot, schedule 40 polyvinyl chloride (PVC) screen (10-foot) and riser pipe. A #1 silica sand filter pack was installed from the bottom to 2 feet above the screened interval. A bentonite seal consisting of uncoated bentonite chips was placed on top of the filter pack and allowed to hydrate prior to grouting. Grouting consisted of mixing a high-solids-bentonite-cement grout slurry and filling the remaining borehole to the surface. Each monitoring well was completed with a watertight lockable well cap, and flush-mount surface completion.

Well development proceeded by use of a submersible pump that was consistently raised and lowered to surge the screen interval and pull out fines that had accumulated in the well. During well development, groundwater parameters (pH, specific conductivity, temperature, and turbidity) were measured every 5 to 10 minutes by use of a YSI ProDSS Water Quality Meter. The soil cuttings and development water were containerized and treated as investigation-derived waste (IDW), as discussed in Section 4.6.

A California-licensed surveyor surveyed the newly installed wells to determine top-of-casing elevations and spatial coordinates. Well survey information is in Appendix F.

4.2 SOIL SAMPLING

Field personnel collected soil samples at AOPCs 1, 2, 6, and 7 using a hand auger. Samples were collected within depth intervals of 0-6 and 6-24 inches bgs. Soils not used during sampling were put back into their respective boreholes. Bentonite chips were added to fill any remaining void.

In total, 28 soil samples from 14 locations were collected for PFAS analysis. Table 4-1 summarizes the soil samples, and Figure 5-1 (AOPCs 1, 6 and 7) and Figure 5-2 (AOPC 2) show soil sampling locations. Historical soil samples collected at AOPC 23 (Hangar 4), which was not investigated during the SI, are included in Figure 5-3 for reference.

During installation of new monitoring wells (Section 4.1), soil cores were also collected to assess lithology and ensure screens were properly set. Each soil core was thoroughly described with regard to sample recovery, lithology (color, grain size, sorting/grading, angularity, density/consistency, Unified Soil Classification System [USCS] designation, etc.), indications of contamination (staining or odors), moisture content, or any other notable observations/ information. Soil boring logs are in Appendix D.

4.3 GROUNDWATER SAMPLING

Groundwater samples were collected from 69 permanent monitoring wells (existing and new). Table 4-3 summarizes the monitoring well samples, and Figure 5-4 through Figure 5-15 show the groundwater sample locations. Historical groundwater samples collected at AOPC 23 (Hangar 4),

which was not investigated during the SI, are included in Figure 5-16 for reference. Groundwater sample log sheets are in Appendix D. Water level measurements from wells sampled are also listed in Table 4-6.

Sampling of the permanent monitoring wells accorded with USEPA Standard Operating Procedures for Low Stress (Low-Flow Purging and Sampling of Groundwater Monitoring Wells; see ARC SI SAP/QAPP Worksheet #21 for reference SOPs). Tubing in the existing monitoring wells was replaced with high-density polyethylene (HDPE) tubing prior to sampling to prevent cross-contamination, and HDPE tubing was used during collection of all new monitoring well samples.

In accordance with the ARC SI SAP/QAPP, sampling of permanent monitoring wells included use of HDPE and silicone tubing, a YSI ProDSS multi-parameter water quality meter, and a submersible, stainless-steel bladder pump. Field parameters and water levels were recorded during low-flow purging activities. These parameters included turbidity, dissolved oxygen, pH, oxidation-reduction potential (ORP), specific conductivity, temperature, and salinity. Disposal of tubing and other non-reusable sampling equipment occurred after work at each well. Reusable sampling equipment (i.e., bladder pumps) was decontaminated after work at each well. Purge water was containerized and treated as IDW (see Section 4.6).

4.4 SURFACE WATER SAMPLING

Surface water samples were not collected during the July 2021 sampling event due to lack of surface water. Subsequently, BB&E sampled surface water at four locations at NASA ARC on November 15, 2021. Table 4-4 shows the AOPCs where surface water was sampled: AOPC 11 (Building 191 Pump Station), AOPC 12 (Stormwater Settling Basin/Eastern Diked Marsh [within IR 25]), AOPC 13 (NASA Groundwater Extraction Treatment System)/AOPC 14 (Middlefield-Ellis-Whisman Groundwater Extraction Treatment System), and AOPC 19 (Stormwater Retention Ponds [within IR 25]). All surface water samples were collected by directly immersing the sample containers into the surface water. Pace Analytical provided the sample containers specifically for PFAS sampling. PFAS-free sampling procedures were followed. Conclusions and

recommendations based on data from these samples assume no changes in influent/effluent concentrations during the months between influent/effluent sampling and surface water sampling.

4.5 INFLUENT/EFFLUENT SAMPLES

The Industrial Wastewater Treatment Facility (IWTF) treats effluent from NASA ARC groundwater treatment systems by applying various treatment methods. In accordance with the ARC SI SAP/QAPP (Section 14.2.8), one influent and one effluent sample were collected from three treatment Systems (AOPC 13, AOPC 14, and AOPC 15), and one effluent sample was collected from one treatment System (AOPC 20) (see Figure 1-2). Influent and effluent samples were collected directly into HDPE sample bottles at influent and/or effluent spigots. Table 4-4 lists influent/effluent sampling locations.

4.6 INVESTIGATION-DERIVED WASTE MANAGEMENT

In accordance with the ARC SI SAP/QAPP, IDW consisting of purge water, development water, decontamination water, drilling fluid, and soil cuttings from well installation was containerized in 55-gallon drums. Twenty drums of IDW were generated (eight soil and 12 groundwater), labeled, and temporarily stored at Building 45A. Samples collected from each drum of containerized IDW included two representative composite solid samples and one composite water quality sample. NASA received IDW records and sample analytical results.

4.7 FIELD TASK MODIFICATIONS

One permanent monitoring well (PFAS-B), specified for installation at AOPC 3 in the SIWP and SAP/QAPP, was not installed due to concerns with drilling into utility lines and pipes, and drilling through historical concrete around Hangars 2 and 3. An alternate well location was not selected for installation, as further investigation is recommended at this AOPC based on results from other wells.

Another permanent monitoring well specified in the SIWP was not sampled (REG 6A-PIE at AOPC 5-Hangar N211), as this well could not be located. Field observation determined that well

14D12A (which was sampled at AOPC 5) was near REG 6A-PIE, and therefore data from 14D12A were determined adequate to achieve the SI objective in this area of AOPC 5.

Several other wells scoped for sampling could not be found in the field, and were therefore replaced with nearby wells. Wells 3/114-MW1 (AOPC 3), W7-19 (AOPC 3), W3-3 (AOPC 17), W2-2A (AOPC 9), and LGMW-1 (AOPC 10) in the SIWP and SAP/QAPP were not found, and therefore were replaced with nearby wells UST3-MW-02, W7-3, W3-8, W2-12, and WGC2-1, respectively.

One additional surface water sample was collected at the Stevens Creek outfall, for AOPCs 13 and 14, in addition to the three surface water sample locations (AOPC 11, AOPC 12, and AOPC 19) that were specified in the SAP/QAPP.

Table 4-1. Soil Sample Location Summary

Location	Depth [feet bgs]	Analysis PFAS	Rationale
AOPC1-SB01	0 - 0.5	X	Sample beside the paved areas where PFAs may have run off the pavement surface.
AOPC1-SB01	0.5 - 2	X	Sample beside the paved areas where PFAs may have run off the pavement surface.
AOPC1-SB02	0 - 0.5	X	Sample beside the paved areas where PFAs may have run off the pavement surface.
AOPC1-SB02	0.5 - 2	X	Sample beside the paved areas where PFAs may have run off the pavement surface.
AOPC1-SB03	0 - 0.5	X	Sample beside the paved areas where PFAs may have run off the pavement surface.
AOPC1-SB03	0.5 - 2	X	Sample beside the paved areas where PFAs may have run off the pavement surface.
AOPC1-SB04	0 - 0.5	X	Sample beside the paved areas where PFAs may have run off the pavement surface.
AOPC1-SB04	0.5 - 2	X	Sample beside the paved areas where PFAs may have run off the pavement surface.
AOPC2-SB01	0 - 0.5	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB01	0.5 - 2	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB02	0 - 0.5	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB02	0.5 - 2	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB03	0 - 0.5	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB03	0.5 - 2	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB04	0 - 0.5	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB04	0.5 - 2	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB05	0 - 0.5	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB05	0.5 - 2	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB06	0 - 0.5	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB06	0.5 - 2	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB07	0 - 0.5	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC2-SB07	0.5 - 2	X	Sample seven locations on the 12th fairway around the crash site location.
AOPC6-SB01	0 - 0.5	X	Sample in the unpaved areas at one location where PFAS may have run off the paved areas.
AOPC6-SB01	0.5 - 2	X	Sample in the unpaved areas at one location where PFAS may have run off the paved areas.
AOPC7-SB01	0 - 0.5	X	Sample 2 discrete sample locations beside the paved areas where PFAS may have run off the pavement surface.
AOPC7-SB01	0.5 - 2	X	Sample 2 discrete sample locations beside the paved areas where PFAS may have run off the pavement surface.
AOPC7-SB02	0 - 0.5	X	Sample 2 discrete sample locations beside the paved areas where PFAS may have run off the pavement surface.
AOPC7-SB02	0.5 - 2	X	Sample 2 discrete sample locations beside the paved areas where PFAS may have run off the pavement surface.

Notes:
bgs - below ground surface
PFAS - per- and polyfluoroalkyl substances.
X = PFAS analysis performed
PFAS analysis by USEPA Method 537.1, compliant with DoD QSM 5.3, Table B-15.

Table 4-2. Groundwater Monitoring Well Sample Location Summary

Location	Screen Interval [feet bgs]	Analysis		Rationale
		PFAS	Field Parameters	
14C60A	6-16	X	X	Determine presence or absence of PFAS in groundwater at AOPC 1. Nine existing wells combined with AOPCs 6, and 7 sampling due to proximity.
11N21A1	16-21	X	X	
PZA1-5C	12.3-26.3	X	X	
UST29-MW02	7.5-16.5	X	X	
W20-01	10-19	X	X	
WU4-25	7-17	X	X	
WU4-9	36.7-46.7	X	X	
PFAS-C	8-18	X	X	Determine the presence or absence of PFAS in groundwater at AOPC 2. Five New wells upgradient and downgradient of crash site sampled to identify PFAS in groundwater. Two new wells combined with AOPC 26 sampling due to proximity.
PFAS-D	6-16	X	X	
PFAS-E	10-20	X	X	
PFAS-F	15-25	X	X	
PFAS-G	8-18	X	X	
UST3-MW-02	6-16	X	X	Determine presence or absence of PFAS in groundwater at AOPC 3. Seven existing wells at AOPC 3 sampled to identify PFAS in groundwater.
W7-10	8-18	X	X	
W7-11	9-15	X	X	
W7-13	15-25	X	X	
W7-3	16-26	X	X	
W7-9	38.5-43.5	X	X	
W19-2	50.9-55.9	X	X	
W11-2	17.5-22.5	X	X	Determine presence or absence of PFAS in groundwater at AOPC 4. One existing well and one new well sampled to identify PFAS in groundwater.
PFAS-H	10-20	X	X	
14D12A	9-24	X	X	Determine presence or absence of PFAS in groundwater at AOPC 5. Six existing wells sampled to identify PFAS in groundwater.
14D28A	6-16.5	X	X	
14D36A	4-16.5	X	X	
14D39A	5-16.5	X	X	
WNB-14	24-29	X	X	
WU4-19	36-41	X	X	
WU4-18	9-24	X	X	Determine presence or absence of PFAS in groundwater at AOPC 6 at two existing wells.
14D02A	5-25	X	X	
W1-14	4-14	X	X	Determine presence or absence of PFAS in groundwater at AOPC 8 at five existing wells.
W1-19	14-19	X	X	
W1-1R	14-24	X	X	
W1-20	14-19	X	X	
W1-5	14.5-19.5	X	X	
W2-16	7.5-17.5	X	X	Determine presence or absence of PFAS in groundwater at AOPC 9. Three existing wells sampled combined with AOPC 16 sampling due to proximity.
W2-12	4.5-15.5	X	X	
W2-13	5.1-15.1	X	X	
WGC2-12	9.5-19.5	X	X	Determine presence or absence of PFAS in groundwater at AOPC 10. Nine existing wells combined with AOPC 16 sampling due to proximity
WGC2-13	10-20	X	X	
WGC2-6	14-24	X	X	
WGC2-10	9.2-19.2	X	X	
WGC2-11	9.5-19.5	X	X	
WGC2-1	9-19	X	X	
WGC2-4	10-20	X	X	
WGC2-5	12-22	X	X	
WGC2-8	12.8-22.8	X	X	

Table 4-2. Groundwater Monitoring Well Sample Location Summary (continued)

Location	Screen Interval [feet bgs]	Analysis		Rationale
		PFAS	Field Parameters	
WU5-9	15-20	X	X	Determine presence or absence of PFAS in groundwater at AOPC 16. One existing well combined with AOPC 9 and 10 sampling due to proximity.
EXW-4	9-34	X	X	Determine presence or absence of PFAS in groundwater at AOPC 17. Five existing wells combined with AOPC 21 sampling due to proximity.
W6-5	28 - 40	X	X	
W6-6	10 - 20	X	X	
WU5-12	40-55	X	X	
W3-1	10-20	X	X	
W3-20	12-22	X	X	
W3-8	8-18	X	X	
WNB-7	10-20	X	X	Determine presence or absence of PFAS in groundwater at AOPC 18. Two existing wells + one proposed new well combined with AOPCs 22 sampling due to proximity.
11E02A	7.5-17.5	X	X	
PFAS-A	8-18	X	X	
W4-14	6-16	X	X	Determine presence or absence of PFAS in groundwater at AOPC 21. Four existing wells and two existing wells combined with AOPCs 17 sampling due to proximity
W4-6	35-50	X	X	
WSW-5	15-20	X	X	
WU5-10	34-39	X	X	
10J01A	2-12	X	X	Determine presence or absence of PFAS in groundwater at AOPC 22. Four existing wells combined with AOPC 18 sampling due to proximity
10J02A	6-16	X	X	
64A	8.5-25	X	X	Determine presence or absence of PFAS in groundwater at AOPC 24.
171A	17-27	X	X	
WU4-1	18.8-28.8	X	X	
W89-1	17.5-27.5	X	X	
15B10A	9-19	X	X	Determine presence or absence of PFAS in groundwater at AOPC 25. Two existing wells combined with AOPCs 18 and 22 sampling due to proximity.
15H12A	6-16	X	X	
W5-3	20-30	X	X	Determine presence or absence of PFAS in groundwater by Eastern Boundary at AOPC 26.

Notes:
X = PFAS analysis performed, or field measurements taken
Field parameters include temperature, specific conductivity, dissolved oxygen, pH, oxidation-reduction potential, and turbidity
PFAS analysis by USEPA Method 537.1, compliant with DoD QSM 5.3, Table B-15
PFAS - per- and polyfluoroalkyl substances
bgs - below ground surface

Table 4-3. Surface Water Sample Location Summary

Location	Analysis	Rationale
	PFAS	
AOPC 11 - Building 191 Pump Station	X	Determine presence or absence of PFAS in surface water discharge at AOPC 11.
AOPC 12 - Stormwater Settling Basin/Eastern Diked Marsh (within IR 25)	X	Determine presence or absence of PFAS in surface water at AOPC 12.
AOPC 13 - NASA Groundwater Extraction Treatment System/ AOPC 14 - Middlefield-Ellis-Whisman Groundwater Extraction Treatment System	X	Determine presence or absence of PFAS in surface water at Stevens Creek outfall.
AOPC 19 - Stormwater Retention Ponds (within IR 25)	X	Determine the presence or absence of PFAS in surface water at culvert discharge at AOPC 19.

Notes:
PFAS - per- and polyfluoroalkyl substances
X = PFAS analysis performed
PFAS analysis by USEPA Method 537.1, compliant with DoD QSM 5.3, Table B-15.

Table 4-4. Influent/Effluent Sample Location Summary

Location	Analysis	Rationale
	PFAS	
AOPC 13 - NASA Groundwater Extraction Treatment System	X	Evaluate the presence of PFAS in influent/effluent at AOPC 13
AOPC 14 - MEW Groundwater Extraction Treatment System	X	Evaluate the presence of PFAS in influent/effluent at AOPC 14
AOPC 15 - West-Side Aquifers Treatment System	X	Evaluate the presence of PFAS in influent/effluent at AOPC 15
AOPC 20 - Building N271 Industrial Wastewater Pretreatment Plant	X	Evaluate the presence of PFAS in effluent at AOPC 20

Notes:
PFAS - per- and polyfluoroalkyl substances
X = PFAS analysis performed
PFAS analysis by USEPA Method 537.1, compliant with DoD QSM 5.3, Table B-15.

Table 4-5. Monitoring Well Construction Details

Well ID[1]	Well Completion Date	Well Diameter (inches)	Total Well Depth (feet bgs)	Screened Interval (feet bgs)	T.O.C. Elevation (feet amsl)	Depth to Water (feet below T.O.C.)	Groundwater Elevation (feet amsl)
PFAS-A	07/14/2021	2	18	8-18	9.68	6.10	3.58
PFAS-C	07/16/2021	2	18	8-18	28.68	7.16	21.52
PFAS-D	07/15/2021	2	16	6-16	35.45	7.66	27.79
PFAS-E	07/15/2021	2	20	10-20	39.37	5.24	34.13
PFAS-F	07/15/2021	2	25	15-25	45.10	7.95	37.15
PFAS-G	07/15/2021	2	18	8-18	37.18	7.44	29.74
PFAS-H	07/14/2021	2	20	10-20	4.72	5.74	-1.02

Notes:

[1] PFAS-B could not be installed due to utility line/historical concrete concerns

amsl - above mean sea level

bgs - Below ground surface

T.O.C - Top of casing.

Elevations are based on North American Vertical Datum of 1988 (NAVD 88)

Table 4-6. Water Level Measurements

Well ID	July 2021	
	Depth to Water (feet below T.O.C.)	Depth to Well Bottom (feet below T.O.C)
10J01A	6.52	12.34
10J02A	6.79	16.26
11E02A	7.55	20.04
11N21A1	6.88	20.65
14C60A	8.80	15.87
14D02A	6.89	23.85
14D12A	9.55	25.75
14D28A	8.06	16.14
14D36A	7.60	16.77
14D39A	8.83	16.85
15B10A	6.83	19.77
15H12A	5.99	15.49
171A	8.44	27.10
64A	8.95	16.12
EXW-4	7.32	37.21
PFAS-A	6.10	17.96
PFAS-C	7.16	18.02
PFAS-D	7.66	15.99
PFAS-E	5.24	21.31
PFAS-F	7.95	25.00
PFAS-G	7.44	18.07
PFAS-H	5.74	19.99
PZA1-5C	9.57	26.50
UST29-MW02	5.59	17.93
UST3-MW-02	6.33	16.36
W11-2	7.86	24.44
W1-14	5.54	17.56
W1-19	5.11	21.16
W1-1R	7.82	27.45
W1-20	4.35	21.85
W1-5	5.24	21.35
W19-2	7.60	57.65
W20-01	7.26	19.40
W2-12	6.98	16.71
W2-13	5.93	18.36
W2-16	3.75	17.76
W3-1	5.30	19.56
W3-20	4.98	21.77
W3-8	4.18	14.10
W4-14	6.11	16.22

Table 4-6. Water Level Measurements (continued)

Well ID	July 2021	
	Depth to Water (feet below T.O.C.)	Depth to Well Bottom (feet below T.O.C)
W4-6	5.87	46.49
W5-3	6.86	30.30
W6-5	6.04	43.28
W6-6	6.06	18.67
W7-10	8.45	16.12
W7-11	7.56	12.41
W7-13	6.71	23.15
W7-3	7.95	25.87
W7-9	8.41	42.53
W89-1	11.24	27.25
WGC2-1	0.23	19.32
WGC2-10	1.11	19.90
WGC2-11	0.21	18.94
WGC2-12	3.34	20.25
WGC2-13	1.76	18.75
WGC2-4	1.80	19.82
WGC2-5	2.29	21.62
WGC2-6	2.91	23.26
WGC2-8	2.15	23.78
WNB-14	6.34	23.21
WNB-7	5.24	20.88
WSW-5	5.76	19.32
WU4-1	12.81	28.55
WU4-18	6.59	23.73
WU4-19	8.19	41.40
WU4-25	6.16	17.42
WU4-9	11.13	46.75
WU5-10	6.31	38.18
WU5-12	5.60	53.79
WU5-9	1.51	19.90

Note:
T.O.C. - Top of casing.

SECTION 5
ANALYTICAL RESULTS AND FINDINGS

Analytical results and findings presented in this section are from samples collected within the 26 AOPCs identified in the PA.

Figures 5-1 through 5-18 spatially represent PFOA, PFOS, PFBS, HFPO-DA, PFNA, and PFHxS analytical results within the AOPCs. Figures with groundwater data also show the general direction of groundwater flow. Data collected prior to the SI are also shown on figures, as applicable, but only with limited datasets. Approximate groundwater flow direction in the western portion of ARC (west of the airfield) derives from 2018 groundwater elevation data (NASA 2019c). Approximate groundwater flow direction in the eastern portion of ARC derives from 2017 groundwater elevation data (Navy 2017). Approximate groundwater flow directions near AOPCs were adjusted to reflect recent 2021 groundwater level measurements during PFAS sampling. These figures show exceedances of federal RSLs listed in Table 2-1. Table 5-1 through Table 5-7 summarize all AOPCs by media, indicating which samples exceeded federal or CSWRCB RSLs. Table 5-8 includes QA/QC data. Complete laboratory analytical reports are in Appendix G, and data validation reports are in Appendix H.

The following subsections convey analytical results from sampling during the SI. As indicated in Table 4-2, data from monitoring wells close to potential source areas were used to assess several AOPCs. Based on water table elevations, existing wells were used that seemed obviously downgradient of a potential AOPC source to detect any potential releases. Often existing wells applied to multiple potential AOPCs. These monitoring wells are discussed or referenced between sections accordingly.

5.1 AOPC 1 – FORMER FIREFIGHTING TRAINING AREA (IR 10, 12, 20)

Soil and groundwater samples were collected at AOPC 1. Soil samples were collected at four locations. At each location, a surface (0 to 0.5 feet bgs) and subsurface (0.5 to 2 feet bgs) soil sample were collected, for a total of eight soil samples. Groundwater samples were collected at nine existing monitoring well locations, including two sampled during a previous sampling event during September 2019. Figure 5-1 and Figure 5-4 compare PFOA, PFOS, PFNA, PFHxS,

HFPO-DA, and PFBS concentrations at AOPC 1 to federal screening levels. Table 5-1 and Table 5-3 compare PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations at AOPC 1 to federal and state screening levels.

Soil

Seventeen of the 28 PFAS compounds were detected in soil samples from AOPC 1. PFOS was detected at concentrations exceeding the soil RSL of 13 µg/kg in five samples (SB01, 0-0.5 at 61 µg/kg; SB01, 0.5-2 at 40 µg/kg; SB03, 0-0.5 at 300 µg/kg; SB03, 0.5-2 at 920 µg/kg; and SB04, 0-0.5 at 22 µg/kg), and above the human health and ecologic ESLs of 12 and 13 µg/kg, respectively, in the same five samples. PFOA was detected at concentrations exceeding the human health ESL of 3.8 µg/kg in five samples (SB01, 0-0.5 at 7 µg/kg; SB01, 0.5-2 at 30 µg/kg; SB02, 0.5-2 at 7.1 µg/kg; SB04, 0-0.5 at 120 µg/kg; and SB04, 0.5-2 at 45 µg/kg). PFOA concentrations exceeded the ecologic ESL of 84 µg/kg in one sample (SB04, 0-0.5 at 120 µg/kg). PFOA exceeded the soil RSL of 19 µg/kg in three samples (SB01, 0.5-2 at 30 µg/kg; SB04, 0-0.5 at 120 µg/kg; and SB04, 0.5-2 at 45 µg/kg). Highest concentration of PFNA detected was 0.71 µg/kg, which did not exceed the soil RSL at 13 µg/kg. Highest concentration of PFHxS detected was 42 µg/kg, which did not exceed the soil RSL at 130 µg/kg. HFPO-DA was non-detect in all samples. No PFBS screening level exceedances occurred, and the highest concentration detected was 1.8 µg/kg. Table 5-1 lists analytical data from soil samples, and Table 5-2 lists frequencies of detection and maximum concentrations in soil. Frequency of detection tables for each AOPC are in Appendix I.

Groundwater

Seventeen of the 28 PFAS compounds were detected in groundwater samples from AOPC 1. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in six samples (11N21A1 at 350 ng/L, 14C60A at 140 ng/L, UST29-MW02 at 140 ng/L, W20-01 at 240 ng/L, WU4-25 at 27 ng/L, and PZA1-5C at 38 ng/L). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in seven samples (11N21A1 at 7,700 ng/L, 14C60A at 1,000 ng/L, PZA1-5C at 110 ng/L, UST29-MW02 at 1,100 ng/L, W20-01 at 5,000 ng/L, WU4-25 at 13 ng/L, and WU4-9 at 18 ng/L). PFHxS was detected at concentrations exceeding the groundwater RSL

of 39 ng/L in six samples (11N21A1 at 3,300 ng/L, 14C60A at 970 ng/L, PZA1-5C at 250 ng/L, UST29-MW02 at 1,200 ng/L, and WU4-25 at 55 ng/L). PFNA was detected at concentration exceeding the groundwater RSL of 5.9 ng/L in one sample (W20-01 at 36 ng/L). There were no PFBS screening level exceedances, and the highest concentration detected was 520 ng/L. HFPO-DA was non-detect in all samples.

During the September 2019 sampling event, previously cited in Section 3.6.1 of this document, two samples were collected at AOPC 1. Four of the 28 compounds from the target analyte list were not included in this prior event. HFPO-DA, Chemical Abstracts Service (CAS) #13252-13-6 is the only one of those compounds compared to screening levels as a part of this inspection. Sixteen of the 24 PFAS analytes were detected in the samples collected during this event. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in both samples (W12-6 at 457 ng/L and W12-20 at 5,540 ng/L). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in both samples (W12-6 at 2,010 ng/L and W12-20 at 4,090 ng/L). PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in both samples (W12-6 at 1,150 ng/L and W12-20 at 10,400 ng/L). PFNA was detected at concentration exceeding the groundwater RSL of 5.9 ng/L in one sample (W12-20 at 111 ng/L). PFBS was detected at concentration exceeding the groundwater RSL of 600 ng/L in one sample (W12-20 at 931 ng/L).

Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.2 AOPC 2 – CRASH SITE (SUNNYVALE GOLF COURSE)

Soil and groundwater samples were collected at AOPC 2. Soil samples were collected at seven locations. At each location, a surface (0 to 0.5 feet bgs) and subsurface (0.5 to 2 feet bgs) soil sample were collected, for a total of 14 soil samples. Groundwater samples were collected at five locations. Figure 5-2 and Figure 5-5 compare PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 2 to federal screening levels. Table 5-1 and Table 5-3

compare PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 2 to federal and state screening levels.

Soil

Thirteen of the 28 PFAS were detected in soil samples from AOPC 2. PFOS was detected at concentrations exceeding the RSL, human health, and ecologic ESLs in four samples (SB01, 0-0.5 at 41 µg/kg; SB02, 0-0.5 at 19 µg/kg; SB05, 0-0.5 at 14 µg/kg; and SB05, 0.5-2 at 21 µg/kg). PFOA was detected at concentrations exceeding the human health ESL of 3.8 µg/kg in four samples (SB01, 0-0.5 at 6.3 µg/kg; SB01, 0.5-2 at 5.1 µg/kg; SB02, 0.5-2 at 7.7 µg/kg; and SB04, 0-0.5 at 4.2 µg/kg). PFBS was not detected above screening criteria at 1,900 µg/kg, and the highest concentration detected was an estimated 0.54 µg/kg in SB04, 0-0.5. PFHxS was not detected above screening criteria at 130 µg/kg, and the highest concentration detected was 14 µg/kg. PFNA was not detected above screening criteria at 19 µg/kg, and the highest concentration detected was 1.1 µg/kg. HFPO-DA was non-detect in all samples. Table 5-1 lists analytical data from soil samples, and Table 5-2 lists frequencies of detection and maximum concentrations in soil. Frequency of detection tables for each AOPC are in Appendix I.

Groundwater

Eleven of the 28 PFAS were detected in groundwater samples from AOPC 2. PFOS was detected at concentrations exceeding the groundwater ESL of 6.5 ng/L and the groundwater RSL of 4 ng/L in three samples (PFAS-F estimated at 11 ng/L, PFAS-F-FD estimated at 15 ng/L, and PFAS-C at 35 ng/L). PFOA and PFBS did not exceed any screening values, and highest concentrations detected were 4.6 and 9.5 ng/L, respectively. PFNA and PFHxS also did not exceed any screening values, and the highest concentrations detected were 1.9 (estimated) and 23 ng/L respectively. HFPO-DA was non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.3 AOPC 3 – HANGARS 2 AND 3 (IR 7)

Groundwater samples were collected within AOPC 3 at seven locations. Figure 5-6 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 3 to federal

screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 3 to federal and state screening levels.

Groundwater

Nineteen of the 28 PFAS were detected in groundwater samples from AOPC 3. PFOA was detected at a concentration exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in six samples (W7-9 at 62 ng/L, W7-3 at 20 ng/L, W7-3-FD at 19 ng/L, W7-13 at 17 ng/L, W7-11 at 19 ng/L, and UST3-MW-02 at 15 ng/L). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL in seven samples (UST3-MW-02 at 50 ng/L, W7-10 at 57 ng/L, W7-9 at 160 ng/L, W7-13 at 23 ng/L, W7-3 at 33 ng/L, W7-3-FD at 30 ng/L, and W7-11 at 59 ng/L). PFNA was detected at concentration exceeding the groundwater RSL of 5.9 ng/L in one sample (W7-9 at 11 ng/L). HFPO-DA was detected at concentration exceeding the groundwater RSL of 6 ng/L in one sample (UST3-MW-02 estimated at 6.1 ng/L). PFHxS was detected at concentration exceeding the groundwater RSL of 39 ng/L in five samples (W7-9 at 180 ng/L, W7-3 at 40 ng/L, W7-3-FD at 42 ng/L, W7-11 at 65 ng/L, and UST3-MW-02 at 57 ng/L). PFBS was not detected above any screening levels, and the highest concentration detected was 14 ng/L. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.4 AOPC 4 – FORMER ENGINE TEST STAND AREA (IR 11)

Two groundwater samples were collected at AOPC 4. Figure 5-7 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 4 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 4 to federal and state screening levels.

Groundwater

Nine of the 28 PFAS were detected in groundwater samples from AOPC 4. PFOA was detected at a concentration exceeding the groundwater RSL of 6 ng/L and groundwater ESL of 5.1 ng/L in both samples (PFAS-H at 16 ng/L and W11-2 at 110 ng/L). There were no screening level exceedances for PFBS, PFHxS or PFOS. PFNA and HFPO-DA were non-detect in all samples.

Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.5 AOPC 5 – HANGAR N211 (WITHIN AOI 3, FORMERLY AOI 12)

Groundwater samples were collected within AOPC 5 at six locations. Figure 5-8 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 5 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 5 to federal and state screening levels.

Groundwater

Nineteen of the 28 PFAS were detected in groundwater samples from AOPC 5. PFBS was detected in sample WU4-19 at 1,500 ng/L, which exceeds the groundwater RSL of 600 ng/L. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in seven samples (14D28A at 77 ng/L, 14D36A at 380 ng/L, 14039A at 250 ng/L, WNB-14 at 120 ng/L, WU4-19 at 330 ng/L, and 14D12A and its duplicate sample, both of which contained 8.3 ng/L of this analyte). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in seven samples (14D28A at 5,400 ng/L, 14D36A at 23,000 ng/L, 14D39A at 40,000 ng/L, WNB-14 at 410 ng/L, and WU4-19 at 3,300 ng/L, and 14D12A and its duplicate sample at 14 and 16 ng/L, respectively). PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in five samples (14D28A at 780 ng/L, 14D36A at 3,000 ng/L, 14D39A at 3,900 ng/L, WNB-14 at 220 ng/L, and WU4-19 at 4,400 ng/L). PFNA was detected at concentrations exceeding the groundwater RSL of 5.9 ng/L in five samples (14D12A and its field duplicate at 6.6 and 7.5 ng/L, respectively; and 14D39A estimated at 8.7 ng/L, WNB-14 at 27 ng/L, and WU4-19 at 7.6 ng/L) HFPO-DA was non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.6 AOPC 6 – HANGAR N248 (AOI 3 EAST)

Soil and groundwater samples were collected at AOPC 6. Soil samples were collected at one location—a surface (0 to 0.5 feet bgs) and subsurface (0.5 to 2 feet bgs) soil samples, for a total of two samples. Groundwater samples were collected at three locations. Figure 5-1 and Figure 5-4 compare PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 6 to federal screening levels. Table 5-1 and Table 5-3 compare PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 6 to federal and state screening levels.

Soil

Twenty-one of the 28 PFAS were detected in soil samples from AOPC 6. PFOS was detected at concentrations of 120 µg/kg in SB01, 0-0.5 and 1,900 µg/kg in SB01, 0.5-2, which both exceed the RSL of 13 µg/kg and the human health and ecologic ESLs of 12 and 13 µg/kg, respectively. PFOA in sample SB01, 0.5-2 exceeded the human health ESL of 3.8 µg/kg at concentration of 5.1 µg/kg. There were no screening level exceedances of PFBS, PFNA, or PFHxS, and highest concentrations detected of each compound were 0.36, 0.43, and 92 µg/kg, respectively. HFPO-DA was non-detect in all samples. Table 5-1 lists analytical data from soil samples, and Table 5-2 lists frequencies of detection and maximum concentrations in soil. Frequency of detection tables for each AOPC are in Appendix I.

Groundwater

Thirteen of the 28 PFAS were detected in groundwater samples from AOPC 6. PFBS was detected at concentration of 620 ng/L in sample 14D02A, which exceeds the groundwater RSL of 600 ng/L. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in all three samples (14C60A at 140 ng/L, 14D02A at 610 ng/L, and WU4-18 at 170 ng/L). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in all three samples (14C60A at 1,000 ng/L, 14D02A at 15,000 ng/L, and WU4-18 at 3,300 ng/L). PFHxS concentrations exceeded the groundwater RSL of 39 ng/L in three samples (14C60A at 970 ng/L, 14D02A at 5,200 ng/L, and WU4-18 at 1,600 ng/L), and PFNA concentration exceeded the groundwater RSL of 5.9 ng/L in one sample (WU4-18 estimated at 14 ng/L). HFPO-DA was non-detect in all

samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.7 AOPC 7 – FIRE DEPARTMENT (BUILDING 580)

At AOPC 7, soil sampling occurred at two locations where a surface (0 to 0.5 feet bgs) and subsurface (0.5 to 2 feet bgs) soil sample were collected, for a total of four soil samples. Groundwater samples were collected at the five closest locations. Figure 5-1 and Figure 5-4 compare PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 7 to federal screening levels. Table 5-1 and Table 5-3 compare PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 7 to federal and state screening levels.

Soil

Eighteen of the 28 PFAS were detected in soil samples from AOPC 7. PFOS was detected at concentrations exceeding the soil RSL of 13 µg/kg and the human health and ecologic ESLs of 12 and 13 µg/kg, respectively, in all four samples (SB01, 0-0.5 at 110 µg/kg; SB01, 0.5-2 at 140 µg/kg; SB02, 0-0.5 at 300 µg/kg; and SB02, 0.5-2 at 1,500 µg/kg). PFOA was detected at concentration exceeding the human health ESL of 3.8 µg/kg in sample SB02, 0.5-2 (4.2 µg/kg). There were no PFHxS screening level exceedances, and the highest concentration detected was 23 µg/kg. There were no PFNA screening level exceedances, and the highest concentration detected was 2.6 µg/kg. There were no PFBS screening level exceedances, and the highest concentration detected was an estimated 0.55 µg/kg. HFPO-DA was non-detect in all samples. Table 5-1 lists soil analytical results, and Table 5-2 lists frequencies of detection and maximum concentrations in soil. Frequency of detection tables for each AOPC are in Appendix I.

Groundwater

Seventeen of the 28 PFAS were detected in groundwater samples from AOPC 7. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples (PZA1-5C at 38 ng/L, UST29-MW02 at 140 ng/L, W20-01 at 240 ng/L, and 14C60A at 140 ng/L). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples (WU4-9 at

18 ng/L, PZA1-5C at 110 ng/L, UST29-MW02 at 1,100 ng/L, W20-01 at 5,000 ng/L, and 14C60A at 1,000 ng/L). PFHxS exceeded the groundwater RSL of 39 ng/L in four samples (14C60A at 970 ng/L, PZA1-5C at 250 ng/L, W20-01 at 2,200 ng/L, and UST29-MW02 at 1,200 ng/L). PFNA exceeded the groundwater RSL of 5.9 ng/L in one sample (W20-01 at 36 ng/L). PFBS did not exceed any screening levels, and the highest concentration detected was 180 ng/L. HFPO-DA was non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.8 AOPC 8 – SITE 1 RUNWAY LANDFILL (IR 1)

Groundwater samples were collected within AOPC 8 at five locations. Figure 5-9 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 8 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 8 to federal and state screening levels.

Groundwater

Ten of the 28 PFAS were detected in groundwater samples from AOPC 8. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in two samples (W1-20 at an estimated concentration of 110 ng/L and W1-14 at 6.5 ng/L). PFOS, PFBS, and PFHxS did not exceed any screening levels, and the highest concentrations detected were 2.8, 6.9, and 6.3 ng/L, respectively. PFNA and HFPO-DA were non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.9 AOPC 9 – SITE 2 FORMER GOLF COURSE LANDFILL (IR 2)

Groundwater samples were collected at AOPC 9 at three locations. Figure 5-10 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 9 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 9 to federal and state screening levels.

Groundwater

Thirteen of the 28 PFAS were detected in groundwater samples from AOPC 9. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L in three samples (W2-12 at 48 ng/L, W2-13 at 32 ng/L, and W2-16 at 230 ng/L). PFOA concentrations in these three samples also exceeded the groundwater ESL of 5.1 ng/L. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L in three samples (W2-12 at 89 ng/L, W2-13 at 9.1 ng/L, and W2-16 at 500 ng/L). PFOS concentrations in these three samples also exceeded the groundwater ESL of 6.5 ng/L. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in three samples (W2-12 at 110 ng/L, W2-13 at 110 ng/L, and W2-16 at 500 ng/L). PFBS did not exceed any screening levels, and the highest concentration detected was 67 ng/L. PFNA did not exceed any screening levels, and the highest concentration detected was 5.9 ng/L. HFPO-DA was non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.10 AOPC 10 – SITE 22 LANDFILL (IR 22)

Groundwater samples were collected within AOPC 10 at nine locations. Figure 5-11 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 10 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 10 to federal and state screening levels.

Groundwater

Thirteen of the 28 PFAS were detected in groundwater samples from AOPC 10. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in five samples (WGC2-8 at 41 ng/L, WGC2-5 at 11 ng/L, WGC2-4 at 17 ng/L, WGC2-11 at 8.3 ng/L, and WGC2-10 at 24 ng/L). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples (WGC2-8 at 53 ng/L, WGC2-4 at 34 ng/L, WGC2-11 at 32 ng/L, WGC2-1 at 4.5 ng/L, and WGC2-10 at 9.1 ng/L). PFHxS was detected at concentration exceeding the groundwater RSL of 39 ng/L in one sample (WCG2-11 at 120 ng/L). PFBS did not exceed any screening levels, and

the highest concentration detected was 37 ng/L. PFNA did not exceed any screening levels, and the highest concentration detected was an estimated 2.7 ng/L. HFPO-DA was non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.11 AOPC 11 – BUILDING 191 PUMP STATION

One surface water sample (B1914-P) was collected at AOPC 11. PFNA was detected at concentration of 13 ng/L, PFHxS was detected at concentration of 930 ng/L, PFBS was detected at concentration of 130 ng/L, PFOA was detected at concentration of 340 ng/L, and PFOS was detected at concentration of 1,400 ng/L. HFPO-DA was non-detect in all samples. No screening levels for surface water have been established. A summary of surface water sample results is in Table 5-5 and on Figure 5-7. Table 5-6 lists frequencies of detection and maximum concentrations in surface water samples.

5.12 AOPC 12 – STORMWATER SETTLING BASIN/EASTERN DIKED MARSH (WITHIN IR 25)

One surface water sample (SBOF-P) was collected at AOPC 12. PFBS was detected at concentration of 4 ng/L, PFOA was detected at estimated concentration of 1.1 ng/L, PFHxS was detected at 6 ng/L, and PFOS was detected at 5.5 ng/L. HFPO-DA and PFNA were non-detect in all samples. No screening levels for surface water have been established. A summary of surface water sample results is in Table 5-5 and on Figure 5-18. Table 5-6 lists frequencies of detection and maximum concentrations in surface water samples.

5.13 AOPC 13 – NASA GROUNDWATER EXTRACTION TREATMENT SYSTEM

Influent/Effluent

Influent and effluent results were compared to USEPA and State groundwater screening levels for indicator purposes only, as the surface water sample was collected months after the influent and effluent samples and may not represent the same discharge. One influent and one effluent sample were collected at AOPC 13.

Concentrations in the influent sample exceeded the groundwater RSLs for PFOS, PFHxS, and PFOA, as well as the groundwater ESLs for PFOS and PFOA. Eleven of the 28 PFAS compounds were detected in the samples from AOPC 13. The PFAS compounds detected and their concentrations in the influent were PFOS (6,800 ng/L), PFOA (330 ng/L), 6:2 fluorotelomer sulfonic acid (FTS) (4,300 ng/L), PFBS (310 ng/L), perfluorobutanoic acid (PFBA) (260 ng/L), perfluorohexanoic acid (PFHpA) (estimated 160 ng/L), perfluoroheptanesulfonic acid (PFHpS) (estimated 180 ng/L), perfluorohexanesulfonic acid (PFHxS) (2,600 ng/L), perfluorohexanoic acid (PFHxA) (1,600 ng/L), perfluoropentanesulfonic acid (PFPeS) (330 ng/L), and perfluoropentanoic acid (PFPeA) (620 ng/L).

PFAS detected and their concentrations in the effluent were PFOS (4.1 ng/L) and PFOA (estimated 0.97 ng/L). This PFOS concentration was 0.1 ng/L above the groundwater RSL of 4 ng/L; however, the concentration in the duplicate sample was an estimated 2.5 ng/L, which is 1.5 ng/L under the screening level. Influent/effluent analytical results are listed in Table 5-7. The location of AOPC 13 is shown on Figure 5-17.

Surface Water

One surface water sample (SCOF-P) was collected at AOPC 13. This is the same sample that was collected to evaluate AOPC 14 (see next section). PFBS was detected at estimated concentration of 1.3 ng/L, PFOA was detected at estimated concentration of 1.1 ng/L, PFHxS was detected at 5.4 ng/L, and PFOS was detected at concentration of 7.4 ng/L. HFPO-DA and PFNA were not detected in the sample. No screening levels for surface water have been established. A summary of surface water sample results is in Table 5-5 and on Figure 5-17. Table 5-6 lists frequencies of detection and maximum concentrations in surface water samples.

5.14 AOPC 14 – MIDDLEFIELD-ELLIS-WHISMAN GROUNDWATER EXTRACTION TREATMENT SYSTEM

Influent/Effluent

Influent and effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. One influent and one effluent sample were collected at AOPC 14. Concentrations in both samples exceeded the groundwater RSLs for PFOS, PFOA, and PFHxS,

as well as the groundwater ESLs for PFOS and PFOA. Eleven of the 28 PFAS were detected in the samples from AOPC 14. PFAS detected and their estimated concentrations in the influent were PFOS (120 ng/L), PFOA (14 ng/L), 6:2 FTS (2.7 ng/L), PFBS (26 ng/L), PFBA (8.2 ng/L), PFHpA (5.7 ng/L), PFHpS (6.5 ng/L), PFHxA (27 ng/L), PFHxS (130 ng/L), PFPeS (21 ng/L), and PFPeA (8.8 ng/L). PFAS detected and their estimated concentrations in the effluent were PFOS (94 ng/L), PFOA (13 ng/L), PFBS (24 ng/L), PFBA (10 ng/L), PFHpA (4.5 ng/L), PFHpS (4.9 ng/L), PFHxS (100 ng/L), PFHxA (22 ng/L), PFPeS (20 ng/L), and PFPeA (9.6 ng/L). In all cases except for PFBA and PFPeA, the influent concentration was higher than the effluent concentration, but difference between those higher and lower concentrations of each analyte was negligible (less than 2 ng/L). Influent/effluent analytical results are listed in Table 5-7. The location of AOPC 14 is shown on Figure 5-17.

Surface Water

One surface water sample (SCOF-P) was collected at AOPC 14. This is the same sample collected to evaluate AOPC 13 (see previous section). PFBS was detected at estimated concentration of 1.3 ng/L, PFOA was detected at estimated concentration of 1.1 ng/L, PFHxS was detected at 5.4 ng/L, and PFOS was detected at 7.4 ng/L. HFPO-DA and PFNA were not detected in the sample. No screening levels for surface water have been established. A summary of surface water sample results is in Table 5-5 and on Figure 5-17. Table 5-6 lists frequencies of detection and maximum concentrations in surface water samples.

5.15 AOPC 15 – WEST-SIDE AQUIFERS TREATMENT SYSTEM (IR 28)

Influent and effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. One influent and one effluent sample were collected at AOPC 15. Concentrations in the influent sample exceeded the groundwater RSLs for PFOS, PFOA, and PFHxS, as well as the groundwater ESLs for PFOS and PFOA. Twelve of the 28 PFAS were detected in the influent sample from AOPC 15. PFAS detected and their concentrations in the influent were PFOS (47 ng/L), PFOA (17 ng/L), 6:2 FTS (6.9 ng/L), 8:2 fluorotelomer sulfonate (FTS) (estimated 2 ng/L), PFBS (12 ng/L), PFBA (9.7 ng/L), PFHpA (6.4 ng/L), PFHpS (estimated 1.4 ng/L), PFHxS (48 ng/L), PFHxA (20 ng/L), PFPeS (8.3 ng/L), and PFPeA (19

ng/L). The only PFAS detected in the effluent sample was PFBA at an estimated concentration of 3.9 ng/L. Influent/effluent analytical results are listed in Table 5-7. The location of AOPC 15 is shown on Figure 5-18.

5.16 AOPC 16 – NORTH PATROL ROAD DITCH (IR 21) AND NORTHERN CHANNEL (IR 27)

Groundwater samples were collected at five locations within AOPC 16. Figure 5-10 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 16 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 16 to federal and state screening levels.

Groundwater

Twenty-seven of the 28 PFAS were detected in groundwater samples from AOPC 16. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples (W2-16 at 230 ng/L, WU5-9 at 44 ng/L, WGC2-4 at 17 ng/L, and WGC2-5 at 11 ng/L). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in three samples (W2-16 at 500 ng/L, WU5-9 at 47 ng/L, and WGC2-4 at 34 ng/L). PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in two samples (W2-16 at 500 ng/L and WU5-9 at 40 ng/L). PFBS and PFNA were not detected at concentrations exceeding any screening levels. HFPO-DA was non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.17 AOPC 17 – MARRIAGE ROAD DITCH (IR 3)

Groundwater samples were collected within AOPC 17 at five locations. Figure 5-12 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 17 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 17 to federal and state screening levels. The two previous surface water samples collected at AOPC 17 (discussed in Section 3.6.17) are shown on Figure 5-12 for reference.

Groundwater

Thirteen of the 28 PFAS were detected in groundwater samples from AOPC 17. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples (W3-1 at 44 ng/L, W3-20 at 160 ng/L, W3-8 at 48 ng/L, and EXW-4 at 24 ng/L). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in four samples (W3-20 at 99 ng/L, W3-8 at 150 ng/L, W3-1 at 39 ng/L, and EXW-4 at 27 ng/L). PFHxS was detected at concentrations exceeding the groundwater RSL in four samples (W3-20 at 130 ng/L, W3-8 at 190 ng/L, W3-1 at 56 ng/L, and EXW-4 at 47 ng/L). PFNA and PFBS were not detected at concentrations exceeding any screening levels. HFPO-DA was non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.18 AOPC 18 – LINDBERGH AVENUE STORM DRAIN DITCH (AOI 6)

Groundwater samples were collected within AOPC 18 at three locations. Figure 5-13 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 18 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 18 to federal and state screening levels.

Groundwater

Twelve of the 28 PFAS were detected in groundwater samples from AOPC 18. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in two samples (11E02A at 34 ng/L and PFAS-A at 25 ng/L). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in all three samples (11E02A at 470 ng/L, PFAS-A at 150 ng/L, and WNB-7 at 55 ng/L). PFHxS was detected at concentrations exceeding the groundwater RSL in two samples (11E02A at 120 ng/L and PFAS-A at 220 ng/L). PFBS did not exceed any screening levels, and the highest concentration detected was 22 ng/L. PFNA did not exceed any screening levels, and the highest concentration detected was an estimated 2.9 ng/L. HFPO-DA was non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of

detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.19 AOPC 19 – STORMWATER RETENTION POND (WITHIN IR 25)

One surface water sample (SWRP-P) was collected at AOPC 19; however, it contained low extracted internal standard recoveries (<20%), affecting most analytes in the sample. The data were flagged with the X and UX qualifiers (see Appendix H). The "X" qualifier in the DoD program indicates that the data point should be excluded, so results from this sample were excluded from data evaluation.

5.20 AOPC 20 – BUILDING N271 INDUSTRIAL WASTEWATER PRETREATMENT PLANT

Effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. One effluent sample was collected at AOPC 20. Concentrations in the sample exceeded the groundwater RSLs for PFOS, PFOA, and PFHxS, and the groundwater ESLs for PFOS and PFOA. Eleven of the 28 PFAS were detected in the sample from AOPC 20. PFAS detected and their concentrations in the effluent were PFOS (210 ng/L), PFOA (36 ng/L), 6:2 FTS (estimated 5.3 ng/L), PFBS (60 ng/L), PFBA (25 ng/L), PFHpA (11 ng/L), PFHpS (12 ng/L), PFHxS (230 ng/L), PFHxA (58 ng/L), PFPeS (50 ng/L), and PFPeA (23 ng/L). Effluent analytical results are listed in Table 5-7. The location of AOPC 20 is shown on Figure 5-17

5.21 AOPC 21 – FORMER INDUSTRIAL WASTEWATER SURFACE IMPOUNDMENTS (IR 4)

Groundwater samples were collected within AOPC 21 at eight locations. Figure 5-12 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 21 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 21 to federal and state screening levels.

Groundwater

Fourteen of the 28 PFAS were detected in groundwater samples from AOPC 21. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in seven samples (EXW-4 at 24 ng/L, W4-14 at 60 ng/L, W4-6 at 12 ng/L, W6-5 at

27 ng/L, W6-6 at 31 ng/L, WSW-5 at 27 ng/L, and WU5-10 at 8.4 ng/L). PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples (W4-14 at 70 ng/L, W6-5 at 52 ng/L, W6-6 at 81 ng/L, EXW-4 at 27 ng/L, and WSW-5 at 99 ng/L). PFOS concentration in W4-6 (6.4 ng/L) exceeded the groundwater RSL. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in five samples (EXW-4 at 47 ng/L, W4-14 at 67 ng/L, W6-5 at 77 ng/L, W6-6 at 73 ng/L, and WSW-5 at 83 ng/L). PFNA and PFBS were not detected at concentrations exceeding any screening levels. HFPO-DA was non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.22 AOPC 22 – BUILDING N249 OUTDOOR AERODYNAMIC RESEARCH FACILITY

Groundwater samples were collected within AOPC 22 at two locations. Figure 5-13 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 22 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 22 to federal and state screening levels.

Groundwater

Seven of the 28 PFAS were detected in groundwater samples from AOPC 22. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng /L and the groundwater ESL of 6.5 ng/L in three samples (10J01A at 15 ng/L, 10J02A at an estimated 15 ng/L, and 10J02A-FD at an estimated 22 ng/L). PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in one sample (10J01A at 56 ng/L, but equal to the RSL in 10J01A-FD). PFOA, PFNA, PFBS, and HFPO-DA were not detected at concentrations exceeding any screening levels. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.23 AOPC 23 – HANGAR 4 (CANG) BUILDING 662

Previous sampling efforts already identified the presence of PFAS at AOPC 23 prior to this SI. However, during the SI, one groundwater sample was collected from a new well, PFAS-C, which is near a well previously sampled for AOPC 23. The location and sampling results for PFAS-C is shown on Figure 5-5. Figures 5-3 and 5-16 show soil and groundwater samples collected at AOPC 23 during previous sampling events, respectively. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations for well PFAS-C to federal and state screening levels.

Groundwater

Ten of the 28 PFAS were detected in the groundwater sample from PFAS-C. PFOS was detected at concentration exceeding the groundwater RSL of 4 ng /L and the groundwater ESL of 6.5 ng/L in the sample (PFAS-C, 35 ng/L). PFOA, PFHxS, and PFBS were not detected at concentrations exceeding any screening levels. HFPO-DA and PFNA were non-detect in all samples.

Groundwater sampling results from previous investigations by the RPS Group and AECOM in 2018-2019 are shown on Figure 5-16. Groundwater, soil, and sediment sample results from those sampling events are discussed in detail in Section 3.6.23.

5.24 AOPC 24 – MIDDLEFIELD-ELLIS-WHISMAN PLUME

Groundwater samples were collected within AOPC 24 at four locations. Figure 5-14 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 24 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 24 to federal and state screening levels.

Groundwater

Eleven of the 28 PFAS were detected in groundwater samples from AOPC 24. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in one sample (W89-1 at 11 ng/L). PFOS was detected at concentrations exceeding

the groundwater RSL of 4 ng/L in three samples (171A at 4.2 ng/L, WU4-1 at 8 ng/L, and W89-1 at 57 ng/L). PFOS concentrations in WU4-1 and W89-1 also exceeded the groundwater ESL of 6.5 ng/L. PFHxS was detected in W89-1 at concentration of 130 ng/L, which exceeded the groundwater RSL of 39 ng/L. PFBS was not detected at concentrations exceeding any screening levels, and the highest concentration detected was 40 ng/L. PFNA and HFPO-DA were non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.25 AOPC 25 – ORION PARK PLUME

Groundwater samples were collected at two locations at AOPC 25. Figure 5-15 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 25 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations within AOPC 25 to federal and state screening levels.

Groundwater

Ten of the 28 PFAS were detected in groundwater samples from AOPC 25. PFOS was detected at concentrations exceeding the groundwater ESL of 6.5 ng/L in one sample (15H12A at 9 ng/L) and exceeding the groundwater RSL of 4 ng/L in two samples (15H12A at 9 ng/L and 15B10A at 4.3 ng/L). PFOA, PFHxS, and PFBS were not detected at concentrations exceeding any screening levels. HFPO-DA and PFNA were non-detect in all samples. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.26 AOPC 26 – EASTERN BOUNDARY (IR 5)

Water level measurements at wells PFAS- C through PFAS- G suggest that groundwater in the unconfined aquifer south of PFAS-C flows northward. Water level measurements suggest presence of a groundwater divide with some groundwater from Lockheed Martin’s property flowing toward the eastern boundary of NASA at well W5-3.

Well W5-3 is in the shallow unconfined aquifer and within Site 5, a former petroleum-product fuel farm that hosted 15 USTs, six ASTs, and an oil-water separator (Tetra Tech 1994). PFAS products potentially are present at Site 5 because of the following possible circumstances typical of bulk fuel tank operations: AFFF discharges during training or fire-fighting events, PFAS in floating layers on top of oil product where these layers were used to reduce evaporation loss, or PFAS in fuel system seals, hoses, and O-rings, or in hydraulic oils used to prevent evaporation, fires, and corrosion (CSWRCB 2021).

Site 5 soil and groundwater had been contaminated by releases of JP-5 Jet fuel during operation of fuel storage tanks. Corrective actions occurred at Site 5 to clean up soils and groundwater from the releases of petroleum hydrocarbons, with partial completion of corrective actions related to petroleum fuel and fuel constituents by December 2011 (Regional Water Board 2011).

Groundwater samples were collected along the ARC eastern property boundary beside AOPC 26 at Well W5-3. Figure 5-5 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations in Well W5-3 to federal screening levels. Table 5-3 compares PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS concentrations in Well W5-3 to federal and state screening levels.

Groundwater

Fifteen of the 28 PFAS were detected in groundwater samples from W5-3 located along the ARC eastern property boundary. PFOA was detected at concentration exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in W5-3 at 350 ng/L. PFOS was detected at concentration exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in W5-3 at 490 ng/L. Concentrations of PFNA and PFHxS (16 and 350 ng/L, respectively) exceeded the groundwater ESLs of 5.9 ng/L and 39 ng/L. The detected concentration of PFBS at 43 ng/L did not exceed any screening levels, and HFPO-DA was not detected in the sample. Monitoring well analytical results are listed in Table 5-3, and Table 5-4 lists frequencies of detection and maximum concentrations in groundwater. Frequency of detection tables for each AOPC are in Appendix I.

5.27 FIELD QA/QC SAMPLES

Field QC samples were collected to ensure that collected samples were representative of the sample source. Table 5-8 indicates that 16 field blanks, four equipment rinsate blanks, and one source water sample were collected during the field event. There were no PFAS detections in the field blanks or source water samples. One equipment rinsate blank originally came back with PFAS compound detections but did not pass data validation. After re-preparing and re-analyzing the sample, the lab report came back with no PFAS detections. Therefore, results from the first analysis were not used for blank action assessment.

Results from these field QA/QC samples do not indicate any non-conformance issues or discrepancies with collection of groundwater or soil samples, and do not impact usability of the data for this project.

TABLE 5-1: PFAS Soil Analytical Results

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Soil RSLs (Residential)	State HH ESL[1]	State Eco ESL[1]	AOPC1-SB01	AOPC1-SB01	AOPC1-SB02	AOPC1-SB02	AOPC1-SB03	AOPC1-SB03
Sample ID					**AOPC1-SB01-0-0.5**	**AOPC1-SB01-0.5-2**	**AOPC1-SB02-0-0.5**	**AOPC1-SB02-0.5-2**	**AOPC1-SB03-0-0.5**	**AOPC1-SB03-0.5-2**
Sample Date					**07/13/2021**	**07/13/2021**	**07/13/2021**	**07/13/2021**	**07/13/2021**	**07/13/2021**
Sample Depth (feet bgs)					**0.00 - 0.50**	**0.50 - 2.00**	**0.00 - 0.50**	**0.50 - 2.00**	**0.00 - 0.50**	**0.50 - 2.00**
PFAS with screening levels (µg/kg)										
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	23	--	--	1.9 U	2 U	1.8 U	2.4 U	1.8 U	2.3 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	1,900	--	--	0.19 J	0.31 J	0.46 U	0.6 U	1.8	1.2
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	130	--	--	7.8	22	0.46 J	1.2	26	42
PERFLUORONONANOIC ACID (PFNA)	375-95-1	19	--	--	0.29 J	0.71 J	0.46 U	0.6 U	0.45 U	0.55 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	19	3.8	84	**7**	**30**	0.29 J	**7.1**	1.6	2.2
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	13	12	13	**61**	**40**	11	2.5	**300**	**920**
PFAS without screening levels (µg/kg)										
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	--	0.95 U	1 U	0.9 U	1.2 U	0.9 U	1.2 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	--	0.95 U	1 U	0.9 U	1.2 U	0.9 U	1.2 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	--	0.95 U	1 U	0.9 U	1.2 U	0.9 U	1.2 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	--	0.95 U	1 U	0.9 U	1.2 U	0.9 U	1.2 U
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	--	0.95 U	1 U	0.9 U	1.2 U	0.9 U	1.2 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	--	0.95 U	1 U	0.9 U	1.2 U	0.9 U	1.2 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	--	0.95 U	1 U	0.9 U	1.2 U	0.9 U	1.2 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	--	0.95 U	1 U	0.9 U	1.2 U	0.9 U	1.2 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	--	0.48 J	0.59 J	0.46 U	0.47 J	0.51 J	0.49 J
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	--	0.47 U	0.49 U	0.46 U	0.6 U	2.5	0.55 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	--	0.81 J	0.49 U	0.46 U	0.6 U	0.45 U	0.55 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	--	0.47 U	0.49 U	0.46 U	0.6 U	0.45 U	0.55 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	--	0.39 J	1.1	0.46 U	0.6 U	0.77 J	3.8
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	--	0.36 J	0.36 J	0.18 J	0.52 J	0.24 J	0.3 J
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	--	1	1.1	0.27 J	0.82 J	3.6	4
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	--	0.34 J	0.49 U	0.46 U	0.6 U	3	0.55 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	--	1.4	0.49 U	0.46 U	0.6 U	4.7	0.27 J
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	--	0.24 J	0.54 J	0.46 U	0.6 U	3	3.2
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	--	0.43 J	0.8 J	0.44 J	0.85 J	0.76 J	1 J
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	--	0.47 U	0.49 U	0.46 U	0.6 U	0.45 U	0.55 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	--	0.47 U	0.49 U	0.46 U	0.6 U	0.45 U	0.55 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	--	0.25 J	0.49 U	0.46 U	0.6 U	0.45 U	0.55 U

TABLE 5-1: PFAS Soil Analytical Results (continued)
PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Soil RSLs (Residential)	State HH ESL[1]	State Eco ESL[1]	AOPC1-SB04	AOPC1-SB04	AOPC2-SB01	AOPC2-SB01	AOPC2-SB02	AOPC2-SB02
Sample ID					**AOPC1-SB04-0-0.5**	**AOPC1-SB04-0.5-2**	**AOPC2-SB01-0-0.5**	**AOPC2-SB01-0.5-2**	**AOPC2-SB02-0-0.5**	**AOPC2-SB02-0.5-2**
Sample Date					**07/13/2021**	**07/13/2021**	**07/13/2021**	**07/13/2021**	**07/13/2021**	**07/13/2021**
Sample Depth (feet bgs)					**0.00 - 0.50**	**0.50 - 2.00**	**0.00 - 0.50**	**0.50 - 2.00**	**0.00 - 0.50**	**0.50 - 2.00**
PFAS with screening levels (µg/kg)										
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	23	--	--	2 U	2.2 U	2.1 U	2.4 U	2.2 U	2.2 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	1,900	--	--	0.5 U	0.55 U	0.55 U	0.6 U	0.23 J	0.55 U
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	130	--	--	5.8	5.5	14	10	6.5	2.6
PERFLUORONONANOIC ACID (PFNA)	375-95-1	19	--	--	0.26 J	0.55 U	0.67 J	0.6 U	1.1	0.55 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	19	3.8	84	**120**	**45**	**6.3**	**5.1**	**7.7**	1.1
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	13	12	13	**22**	6.2	**41**	12	**19**	0.55 U
PFAS without screening levels (µg/kg)										
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	--	1 U	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	--	1 U	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	--	1 U	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	--	1 U	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	--	1 U	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	--	1 U	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	--	1 U	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	--	1 U	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	--	0.36 J	1.1	1.3	0.66 J	1.5	1.6
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	--	0.5 U	0.55 U	0.55 U	0.6 U	0.55 U	0.55 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	--	0.54 J	0.55 U	0.55 U	0.6 U	0.29 J	0.55 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	--	0.25 J	0.55 U	0.55 U	0.6 U	0.55 U	0.55 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	--	0.21 J	0.55 U	0.6 J	0.36 J	0.44 J	0.55 U
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	--	1.6	0.56 J	0.6 J	0.6 U	1.4	0.55 U
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	--	3.1	1.9	1.3	1.2	2	0.81 J
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	--	0.5 U	0.55 U	0.55 U	0.6 U	0.55 U	0.55 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	--	0.5 U	0.55 U	0.54 J	0.6 U	0.55 U	0.55 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	--	0.5 U	0.55 U	0.28 J	0.6 U	0.55 U	0.55 U
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	--	1	1.9	0.65 J	0.62 J	1.1	0.29 J
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	--	0.5 U	0.55 U	0.55 U	0.6 U	0.55 U	0.55 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	--	0.5 U	0.55 U	0.55 U	0.6 U	0.55 U	0.55 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	--	0.5 U	0.55 U	0.55 U	0.6 U	0.55 U	0.55 U

TABLE 5-1: PFAS Soil Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Soil RSLs (Residential)	State HH ESL[1]	State Eco ESL[1]	AOPC2-SB03	AOPC2-SB03	AOPC2-SB04	AOPC2-SB04	AOPC2-SB05	AOPC2-SB05
Sample ID					AOPC2-SB03-0-0.5	AOPC2-SB03-0.5-2	AOPC2-SB04-0-0.5	AOPC2-SB04-0.5-2	AOPC2-SB05-0-0.5	AOPC2-SB05-0.5-2
Sample Date					07/13/2021	07/13/2021	07/13/2021	07/13/2021	07/13/2021	07/13/2021
Sample Depth (feet bgs)					0.00 - 0.50	0.50 - 2.00	0.00 - 0.50	0.50 - 2.00	0.00 - 0.50	0.50 - 2.00
PFAS with screening levels (µg/kg)										
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	23	--	--	2.5 U	2.4 U	2.3 U	2.3 U	2.2 U	2.1 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	1,900	--	--	0.6 U	0.6 U	0.54 J	0.55 U	0.55 U	0.5 U
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	130	--	--	1.2	0.6 U	3.8	1.3	2.8	14
PERFLUORONONANOIC ACID (PFNA)	375-95-1	19	--	--	0.25 J	0.6 U	0.25 J	0.55 U	0.58 J	0.39 J
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	19	3.8	84	1.8	0.6 U	**4.2**	0.55 U	0.64 J	3.3
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	13	12	13	4.2 J	0.6 U	6.7	0.55 U	**14**	**21**
PFAS without screening levels (µg/kg)										
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	--	1.3 U	1.2 U	1.2 U	1.2 U	1.1 U	1.1 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	--	1.3 U	1.2 U	1.2 U	1.2 U	1.1 U	1.1 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	--	1.3 U	1.2 U	1.2 U	1.2 U	1.1 U	1.1 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	--	1.3 UJ	1.2 U	1.2 U	1.2 U	1.1 U	1.1 U
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	--	1.3 U	1.2 UX	1.2 U	1.2 U	1.1 U	1.1 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	--	1.3 U	1.2 U	1.2 U	1.2 U	1.1 U	1.1 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	--	1.3 U	1.2 U	1.2 U	1.2 U	1.1 U	1.1 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	--	1.3 U	1.2 U	1.2 U	1.2 U	1.1 U	1.1 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	--	1.1 J	0.6 U	4.4	2.2	0.34 J	0.86 J
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	--	0.6 U	0.6 U	0.55 U	0.55 U	0.55 U	0.5 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	--	0.6 U	0.6 U	0.55 U	0.55 U	0.55 U	0.5 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	--	0.6 U	0.6 U	0.55 U	0.55 U	0.55 U	0.5 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	--	0.6 U	0.6 U	0.55 U	0.55 U	0.55 U	0.41 J
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	--	0.45 J	0.6 U	0.76 J	0.55 U	0.31 J	0.63 J
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	--	0.86 J	0.6 U	2.2	0.28 J	0.71 J	1.2
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	--	0.6 U	0.6 U	0.55 U	0.55 U	0.55 U	0.5 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	--	0.6 U	0.6 U	0.55 U	0.55 U	0.31 J	0.27 J
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	--	0.6 U	0.6 U	0.55 U	0.55 U	0.55 U	0.31 J
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	--	0.65 J	0.6 U	1.5	0.55 U	0.28 J	0.69 J
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	--	0.6 U	0.6 U	0.55 U	0.55 U	0.55 U	0.5 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	--	0.6 U	0.6 U	0.55 U	0.55 U	0.55 U	0.5 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	--	0.6 U	0.6 U	0.55 U	0.55 U	0.55 U	0.5 U

TABLE 5-1: PFAS Soil Analytical Results (continued)
PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Soil RSLs (Residential)	State HH ESL[1]	State Eco ESL[1]	AOPC2-SB06	AOPC2-SB06	AOPC2-SB07	AOPC2-SB07	AOPC6-SB01	AOPC6-SB01
Sample ID					**AOPC2-SB06-0-0.5**	**AOPC2-SB06-0.5-2**	**AOPC2-SB07-0-0.5**	**AOPC2-SB07-0.5-2**	**AOPC6-SB01-0-0.5**	**AOPC6-SB01-0.5-2**
Sample Date					**07/13/2021**	**07/13/2021**	**07/13/2021**	**07/13/2021**	**07/13/2021**	**07/13/2021**
Sample Depth (feet bgs)					**0.00 - 0.50**	**0.50 - 2.00**	**0.00 - 0.50**	**0.50 - 2.00**	**0.00 - 0.50**	**0.50 - 2.00**
PFAS with screening levels (µg/kg)										
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	23	--	--	2.1 U	2.3 U	2.4 U	2 U	1.8 U	2.6 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	1,900	--	--	0.55 U	0.55 U	0.6 U	0.49 U	0.36 J	0.29 J
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	130	--	--	1.5	0.55 U	0.68 J	0.49 U	12	92
PERFLUORONONANOIC ACID (PFNA)	375-95-1	19	--	--	0.72 J	0.55 U	0.6 U	0.49 U	0.43 U	0.43 J
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	19	3.8	84	3.5	0.26 J	2.4	0.49 U	0.45 J	**5.1**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	13	12	13	9.6	0.55 U	4.9	0.49 U	**120**	**1900**
PFAS without screening levels (µg/kg)										
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	--	1.1 U	1.2 U	1.2 U	1 U	0.85 U	1.3 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	--	1.1 U	1.2 U	1.2 U	1 U	0.85 U	1.3 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	--	1.1 U	1.2 U	1.2 U	1 U	0.85 U	1.3 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	--	1.1 U	1.2 U	1.2 U	1 U	0.85 U	1.3 U
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	--	1.1 U	1.2 U	1.2 U	1 U	0.81 J	1.3 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	--	1.1 U	1.2 U	1.2 U	1 U	0.85 U	1.3 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	--	1.1 U	1.2 U	1.2 U	1 U	1.1 J	1.3 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	--	1.1 U	1.2 U	1.2 U	1 U	0.85 U	1.3 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	--	0.59 J	0.89 J	1.1 J	1.2	0.43 U	0.58 J
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	--	0.55 U	0.55 U	0.6 U	0.49 U	0.42 J	0.65 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	--	0.55 U	0.55 U	0.6 U	0.49 U	1.2	0.65 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	--	0.55 U	0.55 U	0.6 U	0.49 U	0.94	0.65 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	--	0.55 U	0.55 U	0.6 U	0.49 U	0.44 J	25
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	--	1.1	0.55 U	0.61 J	0.23 J	0.43 U	0.47 J
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	--	1 J	0.55 U	0.67 J	0.3 J	1.1	4.1
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	--	0.55 U	0.55 U	0.6 U	0.49 U	0.33 J	0.65 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	--	0.55 U	0.55 U	0.6 U	0.49 U	0.43 J	0.65 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	--	0.55 U	0.55 U	0.6 U	0.49 U	0.58 J	0.94 J
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	--	0.63 J	0.55 U	0.39 J	0.24 J	0.2 J	1.5
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	--	0.55 U	0.55 U	0.6 U	0.49 U	0.28 J	0.65 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	--	0.55 U	0.55 U	0.6 U	0.49 U	0.19 J	0.65 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	--	0.55 U	0.55 U	0.6 U	0.49 U	0.4 J	0.65 U

TABLE 5-1: PFAS Soil Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Soil RSLs (Residential)	State HH ESL[1]	State Eco ESL[1]	AOPC7-SB01	AOPC7-SB01	AOPC7-SB02	AOPC7-SB02
Sample ID					AOPC7-SB01-0-0.5	AOPC7-SB01-0.5-2	AOPC7-SB02-0-0.5	AOPC7-SB02-0.5-2
Date					07/13/2021	07/13/2021	07/13/2021	07/13/2021
Sample Depth (feet bgs)					0.00 - 0.50	0.50 - 2.00	0.00 - 0.50	0.50 - 2.00
PFAS with screening levels (µg/kg)								
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	23	--	--	2.3 U	1.9 U	2.5 U	2.2 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	1,900	--	--	0.55 U	0.48 U	0.55 J	0.41 J
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	130	--	--	5.6	4.8	23	21
PERFLUORONONANOIC ACID (PFNA)	375-95-1	19	--	--	0.39 J	0.72 J	2	2.6
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	19	3.8	84	1.4	1.1	3	**4.2**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	13	12	13	**110**	**140**	**300**	**1500**
PFAS without screening levels (µg/kg)								
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID (11CL-PF3OUDS)	763051-92-9	--	--	--	1.2 U	0.95 U	1.2 U	1.1 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	--	1.2 U	0.95 U	1.2 U	1.1 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	--	1.2 U	0.95 U	1.2 U	1.1 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	--	1.2 U	0.95 U	1.3 J	1.1 U
8:2 FLUOROTELOMER SULFONATE	39108-34-3	--	--	--	1.2 U	0.95 U	0.78 J	0.73 J
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID (9CL-PF3ONS)	756426-58-1	--	--	--	1.2 U	0.95 U	1.2 U	1.1 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID (NEFOSAA)	2991-50-6	--	--	--	1.2 U	0.95 U	1.2 U	1.1 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID (NMEFOSAA)	2355-31-9	--	--	--	1.2 U	0.95 U	1.2 U	1.1 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	--	0.5 J	0.47 J	3.8	0.92 J
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	--	0.56 J	0.48 U	5.1	2.4
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	--	0.27 J	0.47 J	0.95 J	2.4
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	--	0.55 U	0.48 U	0.6 U	0.55 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	--	0.39 J	0.39 J	1.4	3
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	--	0.58 J	0.6 J	11	2.4
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	--	0.87 J	0.81 J	12	4.8
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	--	0.97 J	0.32 J	4.2	4.4
PERFLUOROOCTANE SULFONAMIDE (PFOSA)	1754-91-1	--	--	--	0.62 J	0.55 J	4.6	24
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	--	0.35 J	0.34 J	1.4	0.7 J
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	--	1.4	1.1	31	7.8
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	--	0.55 U	0.48 U	0.6 U	0.55 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	--	0.55 U	0.48 U	0.6 U	0.55 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	--	0.63 J	0.26 J	1.4	0.52 J

Highlighted cell indicates result is greater than screening criteria

"--" = No criteria available

bgs = Below ground surface

Eco = Ecological

EPA = Environmental Protection Agency

ESL = Environmental Screening Level

HH = Human Health

µg/kg = micrograms per kilogram

PFAS = per- and polyfluoroalkyl substances

RSL = Regional Screening Level (note the EPA RSL tables are listed in mg/kg. The RSL values were converted to µg/kg in this table for comparison purposes) U = Not detected at or above the Limit of Qualitation (LOQ)

J = Estimated result < LOQ and > Detection Limit (DL)

[1] HH and Eco ESLs taken from California Water Board

TABLE 5-2: PFAS Soil Frequencies of Detection

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels					
								EPA Res RSL [2]	No. of Samples > Res RSL	HH ESL [3]	No. of Samples > HH ESL	Eco ESL [4]	No. of Samples > Eco ESL
PFAS with screening levels (µg/kg)													
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/28	ND	ND	--	--	1.09	0.11	23	0	--	--	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	10/28	1.80	0.190 J	AOPC1-SB03	0.59	0.39	0.33	1,900	0	--	--	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	25/28	92.0	0.460 J	AOPC6-SB01	13.10	11.73	18.66	130	0	--	--	--	--
PERFLUORONONANOIC ACID (PFNA)	15/28	2.60	0.250 J	AOPC7-SB02	0.76	0.53	0.55	19	0	--	--	--	--
PERFLUOROOCTANOIC ACID (PFOA)	25/28	120	0.260 J	AOPC1-SB04	10.59	9.48	23.68	19	3	3.8	11	84	1
PERFLUOROOCTANESULFONIC ACID (PFOS)	23/28	1,900	2.50	AOPC6-SB01	241.96	198.80	464.87	13	15	12	15	13	15
PFAS without screening levels (µg/kg)													
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/28	ND	ND	--	--	0.55	0.06	--	--	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/28	ND	ND	--	--	0.55	0.06	--	--	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/28	ND	ND	--	--	0.55	0.06	--	--	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	1/28	1.30 J	1.30 J	AOPC7-SB02	1.30	0.58	0.15	--	--	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	3/28	0.810 J	0.730 J	AOPC6-SB01	0.77	0.58	0.09	--	--	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/28	ND	ND	--	--	0.55	0.06	--	--	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	1/28	1.10 J	1.10 J	AOPC6-SB01	1.10	0.58	0.12	--	--	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/28	ND	ND	--	--	0.55	0.06	--	--	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	25/28	4.40	0.340 J	AOPC2-SB04	1.12	1.03	0.99	--	--	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	5/28	5.10	0.420 J	AOPC7-SB02	2.20	0.62	1.05	--	--	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	8/28	2.40	0.270 J	AOPC7-SB02	0.87	0.44	0.45	--	--	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	2/28	0.940	0.250 J	AOPC6-SB01	0.60	0.30	0.13	--	--	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	15/28	25.0	0.210 J	AOPC6-SB01	2.58	1.51	4.68	--	--	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	22/28	11.0	0.180 J	AOPC7-SB02	1.15	0.96	2.03	--	--	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	26/28	12.0	0.270 J	AOPC7-SB02	2.00	1.88	2.36	--	--	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	7/28	4.40	0.320 J	AOPC7-SB02	1.94	0.69	1.15	--	--	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	11/28	24.0	0.270 J	AOPC7-SB02	3.43	1.51	4.55	--	--	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	12/28	3.20	0.240 J	AOPC1-SB03	0.99	0.58	0.76	--	--	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	25/28	31.0	0.200 J	AOPC7-SB02	2.29	2.07	5.84	--	--	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	1/28	0.280 J	0.280 J	AOPC6-SB01	0.28	0.27	0.02	--	--	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	1/28	0.190 J	0.190 J	AOPC6-SB01	0.19	0.27	0.03	--	--	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	6/28	1.40	0.250 J	AOPC7-SB02	0.58	0.34	0.23	--	--	--	--	--	--

TABLE 5-2: PFAS Soil Frequencies of Detection (continued)
PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection
2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.
3 HH ESL = Residential cancer risk ESLs for direct exposure, human health risk in soil (Regional Water Board 2020).
4 Eco ESL = No observed adverse effects levels (NOAEL) in significantly vegetated area ESLs for terrestrial habitat in soils (Regional Water Board 2020)

-- not available
AOPC Area of Potential Concern Ecological
Eco U.S. Environmental Protection Agency
EPA Environmental Screening Levels
ESL Human Health
HH Estimated value
J Non-detect
ND per- and polyfluoroalkyl substances
PFAS Residential
Res Regional Screening Level Micrograms
RSL per kilogram
µg/kg

TABLE 5-3: PFAS Groundwater Analytical Results

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	10J01A	10J02A	10J02A	11E02A	11N21A1	14C60A
Sample ID				AOPC22-10J01A-072221	AOPC22-10J02A-072221	AOPC22-10J02A-072221-FD	AOPC18-11E02A-071221	AOPC1-11N21A1-071221	AOPC1,6,7-14C60A-072221
Sample Date				07/22/2021	07/22/2021	07/22/2021	07/12/2021	07/12/2021	07/22/2021
Screen Interval (feet bgs)				2.00 - 12.00	6.00 - 16.00	6.00 - 16.00	7.50 - 17.50	16.00 - 21.00	6.00 - 16.00
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.8 U	3.4 U	3.4 U	3.5 U	180 U	36 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	11	7.9	7.6	18	520	180
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	**56**	38	39	**120**	**3300**	**970**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.9 U	1.7 U	1.7 U	2.9 J	90 U	18 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	1.5 J	1.9 J	2.2 J	**34**	**350**	**140**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**15**	**15 J**	**22 J**	**470**	**7700**	**1000**
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.8 U	3.4 U	3.4 U	3.5 U	180 U	36 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.8 U	3.4 U	3.4 U	3.5 U	180 U	36 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.8 U	3.4 U	3.4 U	3.5 U	180 U	36 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	3.8 U	79	66	47	260 J	35 J
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.8 U	3.4 U	3.4 U	3.5 UJ	180 U	36 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.8 U	3.4 U	3.4 U	3.5 U	180 U	36 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.8 U	3.4 U	3.4 U	3.5 U	180 U	36 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.8 U	3.4 U	3.4 U	3.5 U	180 U	36 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	22	3.5	3.4	73	190	49
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.9 U	1.7 U	1.7 U	1.8 U	90 U	18 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.9 U	1.7 U	1.7 U	1.8 U	90 U	18 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.9 U	1.7 U	1.7 U	1.8 U	90 U	18 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.9 U	1.7 U	1.7 U	4.2	200	34 J
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	1.9 U	1.7 U	1.7 U	42	160 J	44
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1.9 U	1.7 U	1.7 U	240	900	220
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.9 U	1.7 U	1.7 U	1.8 U	90 U	18 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.9 U	1.7 U	1.7 U	1.8 U	90 U	18 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	4.6	4.4	4.6	12	490	190
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.9 U	1.7 U	1.7 U	230	340	56
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.9 U	1.7 U	1.7 U	1.8 U	90 U	18 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.9 U	1.7 U	1.7 U	1.8 U	90 U	18 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.9 U	1.7 U	1.7 U	1.8 U	90 U	18 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	14D02A	14D12A	14D12A	14D28A	14D36A	14D39A
Sample ID				**AOPC6-14D02A-072221**	**AOPC5-14D12A-071621**	**AOPC5-14D12A-071621-FD**	**AOPC5-14D28A-072221**	**AOPC5-14D36A-072221**	**AOPC5-14039A-071421**
Sample Date				**07/22/2021**	**07/16/2021**	**07/16/2021**	**07/22/2021**	**07/22/2021**	**07/14/2021**
Screen Interval (feet bgs)				**5.00 - 25.00**	**9.00 - 24.00**	**9.00 - 24.00**	**6.00 - 16.50**	**4.00 - 16.50**	**5.00 - 16.50**
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	370 U	3.7 U	3.8 U	3.6 U	3.7 U	3.9 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	**620**	11	12	69	320	310
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	**5200**	24	25	**780**	**3000**	**3900**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	180 U	**6.6**	**7.5**	2.4 J	3.8 J-	**8.7 J+**
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	**610**	**8.3**	**8.3**	**77**	**380**	**250**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**15000**	**14**	**16**	**5400**	**23000**	**40000**
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	370 U	3.7 U	3.8 U	3.6 U	3.7 UJ	3.9 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	370 U	3.7 U	3.8 U	3.6 U	3.7 U	3.9 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	370 U	3.7 U	3.8 U	2.4 J	8.3	3.9 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	680 J	6.2 J	5.6 J	230	690 J	480
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	370 U	3.7 U	3.8 U	6.8 J	28	27
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	370 U	3.7 U	3.8 U	3.6 U	3.7 UJ	3.9 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	370 U	3.7 U	3.8 U	3.6 U	3.7 U	3.9 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	370 U	3.7 U	3.8 U	3.6 U	3.7 U	3.9 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	350 J	9.2	9.7	47	170	270
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	180 U	1.9 U	1.9 U	1.8 U	1.9 UJ	2 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	180 U	1.9 U	1.9 U	1.8 U	1.1 J	2.7 J
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	180 U	1.9 U	1.9 U	1.8 U	1.9 U	2 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	500	1.9 U	1.9 U	80	530	720
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	230 J	3 J	2.5 J	24	89	130
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1700	7.7	7.6	220	930	1600
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	180 U	1.9 U	1.9 U	1.4 J	7.9 J-	50
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	180 U	1.9 U	1.9 U	2.3 J	4.3 J	23
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	590	5.1	5.3	72	340	330
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	510	8.3	8.6	70	250	560
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	180 U	1.9 U	1.9 U	1.8 U	1.9 U	2 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	180 U	1.9 U	1.9 U	1.8 U	1.9 U	2 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	180 U	1.9 U	1.9 U	1.8 U	1.9 U	2 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	15B10A	15H12A	171A	64A	EXW-4	PFAS-A
Sample ID				AOPC25-15B10A-071321	AOPC25-15H12A-071321	AOPC24-171A-071621	AOPC24-64A-071321	AOPC17,21-EXW-4-072321	AOPC18-A-072321
Sample Date				07/13/2021	07/13/2021	07/16/2021	07/13/2021	07/23/2021	07/23/2021
Screen Interval (feet bgs)				9.00 - 19.00	6.00 - 16.00	17.00 - 27.00	8.50 - 25.00	9.00 - 34.00	8.00 - 18.00
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.6 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	4.4	5.7	6.2	5.7	7.7	22
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	8.6	12	7	11	**47**	**220**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.8 U	2.1 U	1.9 U	1.9 U	2 U	0.91 J
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	1.2 J	2.2 J	2.7 J	1.9 U	**24**	**25**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**4.3**	**9**	**4.2**	3.8	**27**	**150**
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.6 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.6 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.6 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	3.6 U	540	3.8 U	9.6	6 J	110
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.6 UJ	4.2 UJ	3.8 U	3.9 UJ	3.9 U	3.6 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.6 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.6 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.6 U	4.2 U	3.8 U	3.9 U	3.9 U	3.6 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	2.8 J	3.3 J	4.4	1.5 J	12	82
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.8 U	2.1 U	1.9 U	1.9 U	2 U	1.8 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.8 U	2.1 U	1.9 U	1.9 U	2 U	1.8 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.8 U	2.1 U	1.9 U	1.9 U	2 U	1.8 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.8 U	2.1 U	1.9 U	1.9 U	2 U	5.2
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	1.8 U	1 J	1.9 U	1.9 U	2 U	52
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1.6 J	2 J	1.5 J	1.9 U	2 U	180
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.8 U	2.1 U	1.9 U	1.9 U	2 U	1.8 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.8 U	2.1 U	1.9 U	1.9 U	2 U	1.8 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	1.6 J	1.9 J	2 J	2.7 J	5	23
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.8 J	1.8 J	1.7 J	1.1 J	2 U	190
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.8 U	2.1 U	1.9 U	1.9 U	2 U	1.8 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.8 U	2.1 U	1.9 U	1.9 U	2 U	1.8 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.8 U	2.1 U	1.9 U	1.9 U	2 U	1.8 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	PFAS-C	PFAS-D	PFAS-E	PFAS-F	PFAS-F	PFAS-G
Sample ID				AOPC2,26-PFAS-C-072921	AOPC2,26-D-072721	AOPC2-PFAS-E-072921	AOPC2-PFAS-F-072921	AOPC2-PFAS-F-072921-FD	AOPC2-PFAS-G-072821
Sample Date				07/29/2021	07/27/2021	07/29/2021	07/29/2021	07/29/2021	07/28/2021
Screen Interval (feet bgs)				8.00 - 18.00	6.00 - 16.00	10.00 - 20.00	15.00 - 25.00	15.00 - 25.00	8.00 - 18.00
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.4 U	3.7 U	3.8 U	3.5 U	3.6 U	3.6 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	9	9.5	8.7	6.4	8.7	7.7
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	23	7.7	15	18	23	6.7
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.7 U	1.9 U	1.9 U	1.3 J	1.9 J	1.8 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	4.6	1.9 U	4.4	1.8 J	1.7 J	1.7 J
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**35**	3.5 J	4	**11 J**	**15 J**	2 J
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.4 U	3.7 U	3.8 U	3.5 U	3.6 U	3.6 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.4 U	3.7 U	3.8 U	3.5 U	3.6 U	3.6 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.4 U	3.7 U	3.8 U	3.5 U	3.6 U	3.6 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	13 J+	33	3.8 U	4.5 J	4.5 J	77
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.4 U	3.7 U	3.8 U	3.5 U	3.6 U	3.6 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.4 U	3.7 U	3.8 U	3.5 U	3.6 U	3.6 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.4 U	3.7 U	3.8 U	3.5 U	3.6 U	3.6 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.4 U	3.7 U	3.8 U	3.5 U	3.6 U	3.6 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	7.2	13	9.4	2.5 J	3.2 J	7.8
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.7 U	1.9 U	1.9 U	1.7 U	1.8 U	1.8 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.7 U	1.9 U	1.9 U	1.7 U	1.8 U	1.8 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.7 U	1.9 U	1.9 U	1.7 U	1.8 U	1.8 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	0.89 J	1.9 U	1.9 U	1.7 U	1.8 U	1.8 U
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	1.7 U	1.9 U	1.9 U	1.7 U	1.8 U	1.8 U
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1.3 J	1.9 U	2.7 J	1.7 U	1.8 U	1.8 U
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.7 U	1.9 U	1.9 U	1.7 U	1.8 U	1.8 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.7 U	1.9 U	1.9 U	1.7 U	1.8 U	1.8 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	2.6 J	1.6 J	3.2 J	2.4 J	2.9 J	1.9 J
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.1 J	1.9 U	1.1 J	1.7 U	1.8 U	1.8 U
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.7 U	1.9 U	1.9 U	1.7 U	1.8 U	1.8 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.7 U	1.9 U	1.9 U	1.7 U	1.8 U	1.8 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.7 U	1.9 U	1.9 U	1.7 U	1.8 U	1.8 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	PFAS-H	PZA1-5C	UST29-MW02	UST3-MW-02	W1-14	W1-19
Sample ID				AOPC4-H-072721	AOPC1,7-PZA1-5C-071521	AOPC1,7-UST29-MW02-072721	AOPC03-UST-MW-02-071921	AOPC8-W1-14-070921	AOPC8-W1-19-070921
Sample Date				07/27/2021	07/15/2021	07/27/2021	07/19/2021	07/09/2021	07/09/2021
Screen Interval (feet bgs)				10.00 - 20.00	12.30 - 26.30	7.50 - 16.50	6.00 - 16.00	4.00 - 14.00	14.00 - 19.00
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.5 U	3.7 U	3.6 U	**6.1 J**	3.5 U	3.5 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	1.2 J	21 J+	130	13	6.9	1.8 U
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	2.1 J	**250**	**1200**	**57**	6.3	1.8 U
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.7 U	1.9 U	4.2	1.9 U	1.8 U	1.8 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	**16**	**38**	**140**	**15**	**6.5**	1.8 U
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	2.3 J	**110**	**1100**	**50**	2.8 J	1.8 U
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.5 U	3.7 U	3.6 U	3.9 U	3.5 U	3.5 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.5 U	3.7 U	3.6 U	3.9 U	3.5 U	3.5 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.5 U	3.7 U	3.6 U	3.9 U	3.5 U	3.5 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	5.2 J	3.7 U	27	290	3.5 U	160
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.5 U	3.7 U	8.4	3.9 U	3.5 U	3.5 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.5 U	3.7 U	3.6 U	3.9 U	3.5 U	3.5 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.5 U	3.7 U	3.6 U	3.9 U	3.5 U	3.5 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.5 U	3.7 U	3.6 U	3.9 U	3.5 U	3.5 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	5.8	13	58	18	10	1 J
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.7 U	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.7 U	1.9 U	1.1 J	1.2 J	1.8 U	1.8 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.7 U	1.9 U	1.8 U	1.4 J	1.8 U	1.8 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.7 U	2.4 J	27	1.4 J	1.8 U	1.8 U
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	1.2 J	7.4	51	2.9 J	2.4 J	1.8 U
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	3.9	22	150	3.3 J	26	1.8 U
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.7 U	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.7 U	1.9 U	1.9 J	1.9 U	1.8 U	1.8 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	1.7 U	27	130	5.6 J+	2.4 J	1.8 U
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	3.9	17	110	5.1	13	1.8 U
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.7 U	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.7 U	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.7 U	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	W1-19	W1-1R	W1-20	W1-5	W11-2	W12-20
Sample ID				AOPC8-W1-19-070921-FD	AOPC8-W1-1R-070921	AOPC8-W1-20-070921	AOPC8-W1-5-070921	AOPC8-W11-2-071221	AOPC1-W12-20-092419
Sample Date				07/09/2021	07/09/2021	07/09/2021	07/09/2021	07/12/2021	09/24/2019
Screen Interval (feet bgs)				14.00 - 19.00	14.00 - 24.00	14.00 - 19.00	14.50 - 19.50	17.50 - 22.50	--
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.6 U	3.4 U	3.5 U	3.6 U	4.2 U	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	1.8 U	1.7 U	1.7 U	1.8 U	5.8	**931**
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	1.8 U	1.7 U	1.4 J	1.4 J	16	**10400**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.8 U	1.7 U	1.7 U	1.8 U	2.1 U	**111**
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	1.8 U	1.7 U	**110 J**	1.8 U	**110**	**5540**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	1.8 U	1.7 U	1.7 U	1.8 U	3 J	**4090**
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.6 U	3.4 U	3.5 U	3.6 U	4.2 U	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.6 U	3.4 U	3.5 U	3.6 U	4.2 U	--
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.6 U	3.4 U	3.5 U	3.6 U	4.2 U	8.05
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	160	110	6 J	79	50	2830
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.6 U	3.4 U	3.5 U	3.6 U	4.2 U	1740
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.6 U	3.4 U	3.5 U	3.6 U	4.2 U	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.6 U	3.4 U	3.5 U	3.6 U	4.2 UJ	2.04 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.6 U	3.4 U	3.5 U	3.6 U	4.2 UJ	2.04 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	0.92 J	1.7 J	4.4	3.7	48	675
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.8 U	1.7 U	1.7 U	1.8 U	2.1 U	2.04 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.8 U	1.7 U	1.7 U	1.8 U	2.1 U	13.6
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.8 U	1.7 U	1.7 U	1.8 U	2.1 U	2.04 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.8 U	1.7 U	1.7 U	1.8 U	2.1 U	127
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	1.8 U	1.7 U	2.8 J	1.8 U	7.9	944
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1.8 U	1.7 U	15	1.3 J	8.4	3590
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.8 U	1.7 U	1.7 U	1.8 U	2.1 U	2.04 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.8 U	1.7 U	1.7 U	1.8 U	2.1 U	128
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	1.8 U	1.7 U	1.7 U	1.8 U	2.1 U	886
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.8 U	1.7 U	4.9	1.8 U	7.6	2880
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.8 U	1.7 U	1.7 UJ	1.8 U	2.1 U	2.04 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.8 U	1.7 U	1.7 U	1.8 U	2.1 U	2.04 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.8 U	1.7 U	1.7 U	1.8 U	2.1 U	2.04 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	W12-6	W19-2	W2-12	W2-13	W2-16	W20-01
Sample ID				AOPC1-W12-6-092619	AOPC3-W19-2-071621	AOPC9-W2-12-072821	AOPC9-W2-13-072021	AOPC9,16-W2-16-070821	AOPC1,7-W20-01-072721
Sample Date				09/26/2019	07/16/2021	07/28/2021	07/20/2021	07/08/2021	07/27/2021
Screen Interval (feet bgs)				--	50.90 - 55.90	4.50 - 15.50	5.10 - 15.10	7.50 - 17.50	10.00 - 19.00
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	--	3.4 U	3.6 U	3.7 U	3.6 U	4.1 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	76.2	1.7 U	19	21	67	110
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	**1150**	8.1	**110**	**110**	**500**	**2200**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	3.55	1.7 U	1.8 U	1.9 U	5.9	**36**
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	**457**	4.1	**48**	**32**	**230**	**240**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**2010**	2.3 J	**89**	**9.1**	**500**	**5000**
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	--	3.4 U	3.6 U	3.7 U	3.6 U	4.1 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	--	3.4 U	3.6 U	3.7 U	3.6 U	4.1 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	2.15 U	3.4 U	3.6 U	3.7 U	3.6 U	4.1 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	36.8	2 J	9.6	2.9 J	54	160
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	4.63	3.4 U	3.6 U	3.7 U	3.6 U	7.9 J
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	--	3.4 U	3.6 U	3.7 U	3.6 U	4.1 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	2.15 U	3.4 U	3.6 U	3.7 U	3.6 U	4.1 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	2.15 U	3.4 U	3.6 U	3.7 UJ	3.6 U	4.1 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	33.9	1.4 J	22	29	46	200
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	2.15 U	1.7 U	1.8 U	1.9 U	1.8 U	2 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	2.15 U	1.7 U	1.8 U	1.9 U	1.8 U	5.3
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	2.15 U	1.7 U	1.8 U	1.9 U	1.8 U	2 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	40.2	1.7 U	2.2 J	1.9 U	15	95
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	41.7	1.7 U	0.99 J	6.2	39	400
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	208	1.1 J	2.7 J	23	150	620
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	2.15 U	1.7 U	1.8 U	1.9 U	1.8 U	3.9 J
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	2.15 U	1.7 U	1.8 U	1.9 U	1.7 J	3.5 J
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	65.8	1.7 U	12	17	68	190
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	66.6	1.7 U	1.5 J	38	83	1400
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	2.15 U	1.7 U	1.8 U	1.9 U	1.8 U	2 UJ
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	2.15 U	1.7 U	1.8 U	1.9 U	1.8 U	2 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	2.15 U	1.7 U	1.8 U	1.9 U	1.8 U	1.2 J

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	W3-1	W3-20	W3-8	W4-14	W4-6	W5-3
Sample ID				AOPC17-W3-1-070721	AOPC17-W3-20-070721	AOPC17-W3-8-070821	AOPC21-W4-14-071921	AOPC21-W4-6-072021	AOPC26-W5-3-070821
Sample Date				07/07/2021	07/07/2021	07/08/2021	07/19/2021	07/20/2021	07/08/2021
Screen Interval (feet bgs)				10.00 - 20.00	12.00 - 22.00	8.00 - 18.00	6.00 - 16.00	35.00 - 50.00	20.00 - 30.00
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.6 U	4.2 U	3.5 U	3.8 U	4 U	3.8 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	8	12	37	13	8.9	43
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	**56**	**130**	**190**	**67**	3 J	**350**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.8 U	1.5 J	1.4 J	3.5 J	1.9 J	**16**
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	**44**	**160**	**48**	**60**	**12**	**350**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**39**	**99**	**150**	**70**	**6.4**	**490**
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.6 U	4.2 U	3.5 U	3.8 U	4 U	3.8 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.6 U	4.2 U	3.5 U	3.8 U	4 U	3.8 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.6 U	4.2 U	3.5 U	3.8 U	4 U	130
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	8.3	14	4.1 J	14 J+	60	4600
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.6 U	4.2 U	3.5 U	3.8 U	4 U	37
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.6 U	4.2 U	3.5 U	3.8 U	4 U	3.8 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.6 U	4.2 U	3.5 U	3.8 U	4 U	3.8 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.6 U	4.2 U	3.5 U	3.8 U	4 UJ	3.8 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	15	19	96	40	20	580
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.8 U	2.1 U	1.8 U	1.9 U	2 U	1.9 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.8 U	2.1 U	1.8 U	2.5 J	3.9	1.2 J
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.8 U	2.1 U	1.8 U	1.9 U	2 U	1.9 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.1 J	2.1 J	5.7	1.4 J	2 U	12
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	1.1 J	10	1.9 J	8.5	2.8 J	480
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1 J	12	7.2	20	13	1400
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.8 U	2.1 U	1.8 U	1.9 U	2 U	1.9 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.8 U	3.8 J	1.8 U	1.9 U	2 U	1.9 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	5.8	11	29	5.4 J+	2 U	42
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.8 U	4.8	12	12	6.6	1300
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.8 U	2.1 U	1.8 U	1.9 U	2 U	1.9 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.8 U	2.1 U	1.8 U	1.9 U	2 U	1.9 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.8 U	2.1 U	1.8 U	1.9 U	2 U	1.9 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	W6-5	W6-6	W7-10	W7-11	W7-13	W7-3
Sample ID				AOPC21-W6-5-072021	AOPC21-W6-6-071921	AOPC3-W7-10-071621	AOPC3-W7-11-071921	AOPC03-W7-13-071921	AOPC3-W7-3-071921
Sample Date				07/20/2021	07/19/2021	07/16/2021	07/19/2021	07/19/2021	07/19/2021
Screen Interval (feet bgs)				28.00 - 40.00	10.00 - 20.00	8.00 - 18.00	9.00 - 15.00	15.00 - 25.00	16.00 - 26.00
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.9 U	3.9 U	3.4 U	4 U	3.5 U	3.7 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	31	9.9	0.87 J	13	7.6	7.9
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	**77**	**73**	10	**65**	36	**40**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	2 U	2 U	1.7 U	2 U	1.6 J	1.9 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	**27**	**31**	4.6	**19**	**17**	**20**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**52**	**81**	**57**	**59**	**23**	**33**
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.9 U	3.9 U	3.4 U	4 U	3.5 U	3.7 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.9 U	3.9 U	3.4 U	4 U	3.5 U	3.7 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.9 U	3.9 U	3.4 U	4 U	3.5 U	3.7 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	12	7.8	12	2.6 J	210	48 J
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.9 U	3.9 U	3.4 U	4 U	3.5 U	3.7 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.9 U	3.9 U	3.4 U	4 U	3.5 U	3.7 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.9 U	3.9 U	3.4 U	8.3	3.5 U	3.7 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.9 U	3.9 U	3.4 U	4 U	3.5 U	3.7 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	19	17	2 J	12	11	12
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	2 U	2 U	1.7 U	2 U	1.8 U	1.9 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	2 U	2 U	1.7 U	2 U	1.8 U	1.9 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	2 U	2 U	1.7 U	1.1 J	1.8 U	1.9 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.1 J	1.7 J	1.7 U	1.3 J	1.8 U	1.9 U
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	2.6 J	11	1.4 J	2.5 J	2.1 J	1.9 U
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	2.3 J	8.3	1 J	4.1	2.1 J	1.4 J
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	2 U	2 U	1.7 U	2 U	1.8 U	1.9 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	2 U	2 U	1.7 U	2 U	0.93 J	1.9 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	8.9	5.5 J+	1.7 U	8.8 J+	3.2 J	4.2 J
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.7 J	5.7	1.7 U	2.4 J	1.2 J	1.9 U
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	2 U	2 U	1.7 U	14	1.8 U	1.9 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	2 U	2 U	1.7 U	2.1 J	1.8 U	1.9 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	2 U	2 U	1.7 U	2 U	1.8 U	1.9 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	W7-3	W7-9	W89-1	WGC2-1	WGC2-10	WGC2-11
Sample ID				AOPC3-W7-3-071921-FD	AOPC3-W7-9-071421	AOPC24-W89-1-071921	AOPC10-WGC2-1-072121	AOPC10-WGC2-10-072121	AOPC10-WGC2-11-072821
Sample Date				07/19/2021	07/14/2021	07/19/2021	07/21/2021	07/21/2021	07/28/2021
Screen Interval (feet bgs)				16.00 - 26.00	38.50 - 43.50	17.50 - 27.50	9.00 - 19.00	9.20 - 19.20	9.50 - 19.50
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.5 U	4.2 U	3.7 U	4 U	3.9 U	3.7 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	7.5	14	40	18	29	37
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	**42**	**180**	**130**	26	26	**120**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.8 U	**11**	1.8 U	2 U	2.7 J	1.9 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	**19**	**62**	**11**	4.7	**24**	**8.3**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**30**	**160**	**57**	**4.5**	**9.1**	**32**
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.5 U	4.2 U	3.7 U	4 U	3.9 U	3.7 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.5 U	4.2 U	3.7 U	4 U	3.9 U	3.7 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.5 U	4.2 U	3.7 U	4 U	3.9 U	3.7 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	28 J	14 J-	43	4.4 J	3.9 U	34 J-
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.5 U	4.2 U	3.7 U	4 U	3.9 U	3.7 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.5 U	4.2 U	3.7 U	4 U	3.9 U	3.7 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.5 U	4.2 U	3.7 U	4 U	3.9 U	3.7 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.5 U	4.2 U	3.7 U	4 U	3.9 U	3.7 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	12	45	12	19	59 J+	49
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.8 U	2.1 U	1.8 U	2 U	2 U	1.9 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.8 U	5.5	1.8 U	2 U	2 U	1.9 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.8 U	2.1 U	1.8 U	2 U	2 UJ	1.9 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.8 U	4.9	0.94 J	2 U	2 U	1.1 J
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	0.93 J	51	4.2	2.6 J	16	0.93 J
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1.2 J	54	21	8.4	48	2.1 J
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.8 U	2.1 U	1.8 U	2 U	2 U	1.9 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.8 U	2.1 U	1.8 U	2 U	2 U	1.9 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	4.1 J+	19	34	7.5	5.1	27
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.8 U	56	13	6.1	41	2.3 J
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.8 U	2.1 U	1.8 U	2 U	2 UJ	1.9 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.8 U	2.1 U	1.8 U	2 U	2 U	1.9 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.8 U	2.1 U	1.8 U	2 U	2 U	1.9 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	WGC2-12	WGC2-12	WGC2-13	WGC2-4	WGC2-5	WGC2-6
Sample ID				AOPC10-WGC2-12-070721	AOPC10-WGC2-12-070721-FD	AOPC10-WGC2-13-072121	AOPC10-WGC2-4-070721	AOPC10-WGC2-5-070721	AOPC10-WGC2-6-070721
Sample Date				07/07/2021	07/07/2021	07/21/2021	07/07/2021	07/07/2021	07/07/2021
Screen Interval (feet bgs)				9.50 - 19.50	9.50 - 19.50	10.00 - 20.00	10.00 - 20.00	12.00 - 22.00	14.00 - 24.00
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.6 U	3.6 U	3.7 U	3.7 U	3.5 U	3.9 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	1.1 J	1.2 J	16	31	1.9 J	1.6 J
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	5.4	5	17	25	4.5	2.2 J
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.8 U	1.8 U	1.9 U	2.1 J	1.8 U	1.9 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	3.7	3.2 J	1.9 U	**17**	**11**	1 J
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	1.8 U	1.8 U	1.4 J	**34**	2.4 J	1.9 U
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.6 U	3.6 U	3.7 U	3.7 U	3.5 U	3.9 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.6 U	3.6 U	3.7 U	3.7 U	3.5 U	3.9 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.6 U	3.6 U	3.7 U	3.7 U	3.5 U	3.9 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	6.9 J	9.9	3.7 U	19	5.6 J	21
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.6 U	3.6 U	3.7 U	3.7 U	3.5 U	3.9 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.6 U	3.6 U	3.7 U	3.7 U	3.5 U	3.9 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.6 U	3.6 U	3.7 U	3.7 U	3.5 U	3.9 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.6 U	3.6 U	3.7 U	3.7 U	3.5 U	3.9 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	4.1	4.1	21	34 J+	6.1	6.8
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	1.9 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.8 U	1.8 U	1.9 U	1.3 J	1.8 U	1.9 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	1.9 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	1.9 U
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	1.8 U	1.8 U	1.9 U	12	1.1 J	1.9 U
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1.8 U	1.8 U	1.9 U	27	1.8 U	1.9 U
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	1.9 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	1.9 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	1.8 U	1.8 U	6.2	4.4	1.8 U	1.9 U
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.8 U	1.8 U	1.9 U	26	2.3 J	1.9 U
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.8 U	2.1 U	1.9 U	1.8 U	1.7 U	1.9 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	1.9 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	1.9 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	WGC2-8	WNB-14	WNB-7	WSW-5	WU4-1	WU4-18
Sample ID				**AOPC10-WGC2-8-072121**	**AOPC5-WNB-14-071421**	**AOPC18-WNB-7-071221**	**AOPC21-WSW-5-072821**	**AOPC24-WU4-1-071321**	**AOPC6-WU4-18-071221**
Sample Date				**07/21/2021**	**07/14/2021**	**07/12/2021**	**07/28/2021**	**07/13/2021**	**07/12/2021**
Screen Interval (feet bgs)				**12.80 - 22.80**	**24.00 - 29.00**	**10.00 - 20.00**	**15.00 - 20.00**	**18.80 - 28.80**	**9.00 - 24.00**
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.4 U	3.8 U	3.9 U	3.5 U	4.4 U	37 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	5.4	29	12	14	8.4	490
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	37	**220**	32	**83**	25	**1600**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.7 U	**27**	2 U	1.8 U	2.2 U	**14 J**
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	**41**	**120**	1.6 J	**27**	3.3 J	**170**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**53**	**410**	**55**	**99**	**8**	**3300**
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.4 U	3.8 U	3.9 U	3.5 U	4.4 U	37 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.4 U	3.8 U	3.9 U	3.5 U	4.4 U	37 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.4 U	3.8 U	3.9 U	3.5 U	4.4 U	37 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	7	130	58	30 J-	4.9 J	330
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.4 U	18	3.9 UJ	3.5 U	4.4 UJ	20 J
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.4 U	3.8 U	3.9 U	3.5 U	4.4 U	37 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.4 U	3.8 U	3.9 U	3.5 U	4.4 U	37 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.4 U	3.8 U	3.9 U	3.5 U	4.4 U	37 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	11	150	12	17	5	150
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.7 U	1.9 U	2 U	1.8 U	2.2 U	19 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.7 U	8.7	2 U	1.8 U	2.2 U	19 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.7 U	1.3 J	2 U	1.8 U	2.2 U	19 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	3.1 J	7.2	2 U	1.8 U	2.2 U	91
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	4.6	190	2 U	2.7 J	1.6 J	130
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	9.2	550	2.2 J	2.6 J	7.2	720
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.7 U	1.9 U	2 U	1.8 U	2.2 U	19 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.7 U	1.9 U	2 U	1.2 J	2.2 U	19 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	2.7 J	25	8.3	7.3	6.4	350
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	7.7	540	1.8 J	1.7 J	4.9	320
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.7 U	1.9 U	2 U	1.8 U	2.2 U	19 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.7 U	1.9 U	2 U	1.8 U	2.2 U	19 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.7 U	2.2 J	2 U	1.8 U	2.2 U	19 U

TABLE 5-3: PFAS Groundwater Analytical Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	WU4-19	WU4-25	WU4-9	WU5-10	WU5-12	WU5-9
Sample ID				**AOPC5-WU4-19-071421**	**AOPC1-WU4-25-072921**	**AOPC1,7-WU4-9-071521**	**AOPC21-WU5-10-072021**	**AOPC17,21-WU5-12-072021**	**AOPC16-WU5-9-070821**
Sample Date				**07/14/2021**	**07/29/2021**	**07/15/2021**	**07/20/2021**	**07/20/2021**	**07/08/2021**
Screen Interval (feet bgs)				**36.00 - 41.00**	**7.00 - 17.00**	**36.70 - 46.70**	**34.00 - 39.00**	**40.00 - 55.00**	**15.00 - 20.00**
PFAS with screening levels (ng/L)									
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.5 U	3.5 U	3.6 U	4 U	3.7 U	6.5 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	**1500**	7	7.1	2.8 J	1.9 U	6.6
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	**4400**	**55**	34	1 J	2.1 J	**40**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	**7.6**	1.8 U	1.8 U	1.2 J	1.9 U	3.3 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	**330**	**27**	5.1	**8.4**	1.8 J	**44**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**3300**	**13**	**18**	3.5 J	1.9 U	**47**
PFAS without screening levels (ng/L)									
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.5 U	3.5 U	3.6 U	4 U	3.7 U	6.5 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.5 U	3.5 U	3.6 U	4 U	3.7 U	6.5 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.5 U	3.5 U	3.6 U	4 U	3.7 U	6.5 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	620	17	91	6 J	3.5 J	8.4 J
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.5 UJ	3.5 U	3.6 U	4 U	3.7 U	6.5 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.5 U	3.5 U	3.6 U	4 U	3.7 U	6.5 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.5 U	3.5 U	3.6 U	4 U	3.7 U	6.5 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.5 U	3.5 U	3.6 U	4 U	3.7 UJ	6.5 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	260	5.2	4.2	8	3.3 J	16
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.7 U	1.8 U	1.8 U	2 U	1.9 U	3.3 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	4.2	1.8 U	1.8 U	1.7 J	1.9 U	3.3 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.7 U	1.8 U	1.8 U	2 U	1.9 U	3.3 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	170	1.2 J	1.8 U	2 U	1.9 U	3.3 U
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	230	5.8	2.1 J	2.6 J	1.9 U	3.5 J
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1300	13	6	14	1.7 J	6.4 J
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.7 U	1.8 U	1.8 U	2 U	1.9 U	3.3 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	2.7 J	1.8 U	1.8 U	2 U	1.2 J	3.3 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	1200	6.1	7.8	2 U	1.9 U	2 J
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	370	12	4.7	11	1.4 J	6.6
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.7 U	1.8 U	1.8 U	2 U	1.9 U	3.3 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.7 U	1.8 U	1.8 U	2 U	1.9 U	3.3 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.7 U	1.8 U	1.8 U	2 U	1.9 U	3.3 U

Highlighted cell indicates concentration is greater than screening criteria.
"--" = No criteria available.
EPA = Environmental Protection Agency.
ESL = Environmental Screening Level
J = Estimated result < LOQ and > Detection Limit (DL)
J+ = Biased high estimated result
J- = Biased low estimated result
ng/L = nanogram per liter.
PFAS = per- and polyfluoroalkyl substances
RSL = Regional Screening Level.
U = Not detected at or above the Limit of Qualitation (LOQ)

TABLE 5-4: PFAS Groundwater Frequencies of Detection

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	1/77	6.10 J	6.10 J	UST3-MW-02	6.10	7.16	25.48	6	1	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	71/79	1,500	0.870 J	WU4-19	90.96	81.84	222.85	600	3	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	75/79	10,400	1.00 J	W12-20	600.62	570.26	1532.84	39	42	--	--
PERFLUORONONANOIC ACID (PFNA)	25/79	111	0.910 J	W12-20	11.15	6.59	17.74	5.9	9	--	--
PERFLUOROOCTANOIC ACID (PFOA)	71/79	5,540	1.00 J	W12-20	155.37	139.73	627.16	6	53	5.1	53
PERFLUOROOCTANESULFONIC ACID (PFOS)	71/79	40,000	1.40 J	14D39A	1716.56	1542.83	5513.97	4	59	6.5	55
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/77	ND	ND	--	--	7.11	25.49	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/77	ND	ND	--	--	7.11	25.49	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	4/79	130	2.40 J	W5-3	37.19	8.75	28.70	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	68/79	4,600	2.00 J	W5-3	263.00	226.64	767.53	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	11/79	1,740	2.00 J	W12-20	172.70	30.55	196.46	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/77	ND	ND	--	--	7.11	25.49	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	1/79	8.30	8.30	W7-11	8.30	7.03	25.17	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/79	ND	ND	--	--	6.95	25.17	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	78/79	675	1.00 J	W12-20	58.44	57.71	116.75	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/79	ND	ND	--	--	3.47	12.36	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	14/79	13.6	1.10 J	W12-20	3.86	3.98	12.39	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	3/79	1.40 J	1.10 J	UST3-MW-02	1.27	3.48	12.36	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	38/79	720	0.890 J	14D39A	76.19	37.14	117.98	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	56/79	944	0.930 J	W12-20	65.26	46.53	132.14	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	64/79	3,590	1.00 J	W12-20	262.87	213.13	556.20	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	4/79	50.0	1.40 J	14D39A	15.80	4.22	13.41	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	12/79	128	0.930 J	W12-20	14.54	5.53	18.75	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	63/79	1,200	1.60 J	WU4-19	91.46	73.12	194.86	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	61/79	2,880	1.10 J	W12-20	169.00	130.70	398.59	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	1/79	14.0	14.0	W7-11	14.00	3.63	12.41	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	1/79	2.10 J	2.10 J	W7-11	2.10	3.48	12.36	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	2/79	2.20 J	1.20 J	WNB-14	1.70	3.48	12.36	--	--	--	--

TABLE 5-4: PFAS Groundwater Frequencies of Detection (continued)

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 5-5: PFAS Surface Water Analytical Results

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	B1914-P	SBOF-P	SCOF-P
Sample ID		B1914-P-111221	SBOF-P-111221	SCOF-P-111221
Sample Date		11/12/2021	11/12/2021	11/12/2021
PFAS (ng/L)				
10:2 FLUOROTELOMER SULFONIC ACID	120226-60-0	4.2 U	3.5 U	3.5 U
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	4.2 U	3.5 U	3.5 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	4.2 U	3.5 U	3.5 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	4.2 U	3.5 U	3.5 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	230	3.5 U	3.5 U
8:2 FLUOROTELOMER SULFONATE	39108-34-4	30	3.5 U	3.5 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	4.2 U	3.5 U	3.5 U
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	4.2 U	3.5 U	3.5 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	4.2 U	3.5 U	3.5 U
N-ETHYLPERFLUOROOCTANESULFONAMIDE	4151-50-2	4.2 U	3.5 U	3.5 U
N-ETHYLPERFLUOROOCTANESULFONAMIDOETHANOL	1691-99-2	4.2 U	3.5 U	3.5 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	4.2 U	3.5 U	3.5 U
N-METHYLPERFLUOROOCTANESULFONAMIDE	31506-32-8	8.5 U	7 U	7 U
N-METHYLPERFLUOROOCTANESULFONAMIDOETHANOL	24448-09-7	4.2 U	3.5 U	3.5 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	130	4	1.3 J
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	66	2.9 J	1.5 J
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	2.1 U	1.8 U	1.7 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	1.1 J	1.8 U	1.7 U
PERFLUORODODECANESULFONIC ACID (PFDOS)	79780-39-5	4.2 U	3.5 U	3.5 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	2.1 U	1.8 U	1.7 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	31	1.8 U	1.7 U
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	78	1.8 U	1.7 U
PERFLUOROHEXADECANOIC ACID (PFODA)	67905-19-5	4.2 U	3.5 U	3.5 U
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	930	6	5.4
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	220	1.5 J	2.1 J
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	2.1 U	1.8 U	1.7 U
PERFLUORONONANOIC ACID (PFNA)	375-95-1	13	1.8 U	1.7 U
PERFLUOROOCTADECANOIC ACID (PFODA)	16517-11-6	4.2 U	3.5 U	3.5 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	1.2 J	1.8 U	1.7 U
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	1400	5.5	7.4
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	340	1.1 J	1.1 J
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	110	1.2 J	0.99 J
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	160	1.7 J	1.1 J
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	2.1 U	1.8 U	1.7 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	2.1 U	1.8 U	1.7 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	2.1 U	1.8 U	1.7 U

ng/L = nanogram per liter.
U = Not detected at or above the Limit of Qualitation (LOQ)
J = Estimated result < LOQ and > Detection Limit (DL)
PFAS = per- and polyfluoroalkyl substances

TABLE 5-6: PFAS Surface Water Frequencies of Detection

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]
PFAS (ng/L)							
10:2 FLUOROTELOMER SULFONIC ACID	0/3	ND	ND	--	--	1.87	0.20
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/3	ND	ND	--	--	1.87	0.20
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/3	ND	ND	--	--	1.87	0.20
4:2 FLUOROTELOMER SULFONATE	0/3	ND	ND	--	--	1.87	0.20
6:2 FLUOROTELOMER SULFONATE	1/3	230	230	B1914-P	230.00	77.83	131.78
8:2 FLUOROTELOMER SULFONATE	1/3	30.0	30.0	B1914-P	30.00	11.17	16.31
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/3	ND	ND	--	--	1.87	0.20
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/3	ND	ND	--	--	1.87	0.20
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/3	ND	ND	--	--	1.87	0.20
N-ETHYLPERFLUOROOCTANESULFONAMIDE	0/3	ND	ND	--	--	1.87	0.20
N-ETHYLPERFLUOROOCTANESULFONAMIDOETHANOL	0/3	ND	ND	--	--	1.87	0.20
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/3	ND	ND	--	--	1.87	0.20
N-METHYLPERFLUOROOCTANESULFONAMIDE	0/3	ND	ND	--	--	3.75	0.43
N-METHYLPERFLUOROOCTANESULFONAMIDOETHANOL	0/3	ND	ND	--	--	1.87	0.20
PERFLUOROBUTANESULFONIC ACID (PFBS)	3/3	130	1.30 J	B1914-P	45.10	45.10	73.54
PERFLUOROBUTANOIC ACID (PFBA)	3/3	66.0	1.50 J	B1914-P	23.47	23.47	36.84
PERFLUORODECANESULFONIC ACID (PFDS)	0/3	ND	ND	--	--	0.93	0.10
PERFLUORODECANOIC ACID (PFDA)	1/3	1.10 J	1.10 J	B1914-P	1.10	0.95	0.13
PERFLUORODODECANESULFONIC ACID (PFDOS)	0/3	ND	ND	--	--	1.87	0.20
PERFLUORODODECANOIC ACID (PFDOA)	0/3	ND	ND	--	--	0.93	0.10
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1/3	31.0	31.0	B1914-P	31.00	10.92	17.39
PERFLUOROHEPTANOIC ACID (PFHPA)	1/3	78.0	78.0	B1914-P	78.00	26.58	44.53
PERFLUOROHEXADECANOIC ACID (PFODA)	0/3	ND	ND	--	--	1.87	0.20
PERFLUOROHEXANESULFONIC ACID (PFHXS)	3/3	930	5.40	B1914-P	313.80	313.80	533.64
PERFLUOROHEXANOIC ACID (PFHXA)	3/3	220	1.50 J	B1914-P	74.53	74.53	125.98
PERFLUORONONANESULFONIC ACID (PFNS)	0/3	ND	ND	--	--	0.93	0.10
PERFLUORONONANOIC ACID (PFNA)	1/3	13.0	13.0	B1914-P	13.00	4.92	7.00
PERFLUOROOCTADECANOIC ACID (PFODA)	0/3	ND	ND	--	--	1.87	0.20
PERFLUOROOCTANE SULFONAMIDE (FOSA)	1/3	1.20 J	1.20 J	B1914-P	1.20	0.98	0.19
PERFLUOROOCTANESULFONIC ACID (PFOS)	3/3	1,400	5.50	B1914-P	470.97	470.97	804.57
PERFLUOROOCTANOIC ACID (PFOA)	3/3	340	1.10 J	B1914-P	114.07	114.07	195.66
PERFLUOROPENTANESULFONIC ACID (PFPES)	3/3	110	0.990 J	B1914-P	37.40	37.40	62.88
PERFLUOROPENTANOIC ACID (PFPEA)	3/3	160	1.10 J	B1914-P	54.27	54.27	91.57
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/3	ND	ND	--	--	0.93	0.10
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/3	ND	ND	--	--	0.93	0.10
PERFLUOROUNDECANOIC ACID (PFUNA)	0/3	ND	ND	--	--	0.93	0.10

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

-- not available
AOPC Area of Potential Concern
J Estimated value
ND Non-detect
ng/L Nanograms per liter
PFAS per- and polyfluoroalkyl substances

TABLE 5-7: PFAS Analytical Results for Water Treatment Systems

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Ground water RSL	State ESL	AOPC13-SW01	AOPC13-SW01	AOPC13-SW01	AOPC14-SW01
Sample ID				AOPC13-SW01-EF-072221	AOPC13-SW01-EF-072221-FD	AOPC13-SW01-IN-072221	AOPC14-SW01-EF-081821
Sample Date				07/22/2021	07/22/2021	07/22/2021	08/01/2021
PFAS with screening levels (ng/L)							
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.6 U	3.8 U	200 U	4.1 UJ
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	1.8 U	1.9 U	310	24 J
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	1.8 U	1.9 U	**2600**	**100 J**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.8 U	1.9 U	100 U	2.1 UJ
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	1.8 U	0.97 J	**330**	**13 J**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	2.5 J	**4.1**	**6800**	**94 J**
PFAS without screening levels (ng/L)							
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.6 U	3.8 U	200 U	4.1 UJ
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.6 U	3.8 U	200 U	4.1 UJ
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.6 U	3.8 U	200 U	4.1 UJ
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	3.6 UJ	3.8 UJ	4300	4.1 UJ
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.6 U	3.8 U	200 U	4.1 UJ
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.6 U	3.8 U	200 U	4.1 UJ
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.6 U	3.8 U	200 U	4.1 UJ
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.6 U	3.8 U	200 U	4.1 UJ
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	1.8 U	1.9 U	260	10 J
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.8 U	1.9 U	100 U	2.1 UJ
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.8 U	1.9 U	100 U	2.1 UJ
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.8 U	1.9 U	100 U	2.1 UJ
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.8 U	1.9 U	180 J	4.9 J
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	1.8 U	1.9 U	160 J	4.5 J
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1.8 U	1.9 U	1600	22 J
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.8 U	1.9 U	100 U	2.1 UJ
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.8 U	1.9 U	100 U	2.1 UJ
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	1.8 U	1.9 U	330	20 J
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.8 U	1.9 U	620	9.6 J
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.8 U	1.9 U	100 U	2.1 UJ
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.8 U	1.9 U	100 U	2.1 UJ
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.8 U	1.9 U	100 U	2.1 UJ

Water from Water Treatment Systems were compared to USEPA and State groundwater screening criteria for evaluation purposes only
Highlighted cell indicates concentration is greater than screening criteria.
"--" = No criteria available.
EPA = Environmental Protection Agency.
ESL = Environmental Screening Level
ng/L = nanogram per liter.
PFAS = per- and polyfluoroalkyl substances
RSL = Regional Screening Level.
U = Not detected at or above the Limit of Qualitation (LOQ)
J = Estimated result < LOQ and > Detection Limit (DL)

TABLE 5-7: PFAS Analytical Results for Water Treatment Systems (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	AOPC14-SW01	AOPC15-SW01	AOPC15-SW01	AOPC20-SW01
Sample ID				AOPC14-SW01-IN-081821	AOPC15-SW01-EF-072321	AOPC15-SW01-IN-072321	AOPC20-SW01-EF-072221
Sample Date				08/01/2021	07/23/2021	07/23/2021	07/22/2021
PFAS with screening levels (ng/L)							
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	4 UJ	4 U	3.7 U	3.5 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	26 J	2 U	12	60
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	**130 J**	2 U	**48**	**230**
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	2 UJ	2 U	1.9 U	1.8 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	**14 J**	2 U	**17**	**36**
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	**120 J**	2 U	**47**	**210**
PFAS without screening levels (ng/L)							
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	4 UJ	4 U	3.7 U	3.5 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	4 UJ	4 U	3.7 U	3.5 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	4 UJ	4 U	3.7 U	3.5 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	2.7 J	4 UJ	6.9 J	5.3 J
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	4 UJ	4 U	2 J	3.5 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	4 UJ	4 U	3.7 U	3.5 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	4 UJ	4 U	3.7 U	3.5 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	4 UJ	4 U	3.7 U	3.5 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	8.2 J	3.9 J	9.7	25
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	2 UJ	2 U	1.9 U	1.8 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	2 UJ	2 U	1.9 U	1.8 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	2 UJ	2 U	1.9 U	1.8 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	6.5 J	2 U	1.4 J	12
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	5.7 J	2 U	6.4	11
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	27 J	2 U	20	58
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	2 UJ	2 U	1.9 U	1.8 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	2 UJ	2 U	1.9 U	1.8 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	21 J	2 U	8.3	50
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	8.8 J	2 U	19	23
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	2 UJ	2 U	1.9 U	1.8 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	2 UJ	2 U	1.9 U	1.8 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	2 UJ	2 U	1.9 U	1.8 U

Water from Water Treatment Systems were compared to USEPA and State groundwater screening criteria for evaluation purposes only
Highlighted cell indicates concentration is greater than screening criteria.
"--" = No criteria available.
EPA = Environmental Protection Agency.
ESL = Environmental Screening Level
ng/L = nanogram per liter.
PFAS = per- and polyfluoroalkyl substances
RSL = Regional Screening Level.
U = Not detected at or above the Limit of Qualitation (LOQ)
J = Estimated result < LOQ and > Detection Limit (DL)

TABLE 5-8: Summary of QA/QC Sample Results

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE
Sample ID				ERB-01-070721	ERB-02-072921 [1]	ERB-03-072921	ERB-071321-S	FB-01-070721	FB-02-070821	FB-03-070921
Sample Date				07/08/2021	07/29/2021	07/29/2021	07/13/2021	07/07/2021	07/08/2021	07/09/2021
PFAS with screening levels (ng/L)										
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.8 U	**8.3**	3.6 U	4 U	5 U	5 U	4.1 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	1.9 U	5.5	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	1.9 U	35	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.9 U	4.4	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	1.9 U	**75**	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	1.9 U	**280**	1.8 U	2 U	2.6 U	2.6 U	2 U
PFAS without screening levels (ng/L)										
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.8 U	2.5 J	3.6 U	4 U	5 U	5 U	4.1 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.8 U	3.7 J	3.6 U	4 U	5 U	5 U	4.1 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.8 U	4.8 J	3.6 U	4 U	5 U	5 U	4.1 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	3.8 U	770	3.6 U	4 U	5 U	5 U	4.1 U
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.8 U	3.7 J	3.6 U	4 U	5 U	5 U	4.1 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.8 U	3.4 J	3.6 U	4 U	5 U	5 U	4.1 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.8 U	3.1 J	3.6 U	4 U	5 U	5 U	4.1 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.8 U	3.8 J	3.6 U	4 U	5 U	5 U	4.1 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	1.9 U	43	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.9 U	2.1 J	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.9 U	4	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.9 U	3.3 J	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.9 U	6.6	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	1.9 U	24	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1.9 U	89	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.9 U	3.3 J	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.9 U	4.1	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	1.9 U	6.2	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.9 U	190	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	2.3 U	1.6 J	1.8 U	2 U	2.5 U	2.6 U	2 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.9 U	2.1 J	1.8 U	2 U	2.6 U	2.6 U	2 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.9 U	4	1.8 U	2 U	2.6 U	2.6 U	2 U

TABLE 5-8: Summary of QA/QC Sample Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE
Sample ID				FB-04-071221	FB-05-071321	FB-06-071421	FB-07-071521	FB-08-071621	FB-09-071921	FB-10-072021
Sample Date				07/12/2021	07/13/2021	07/14/2021	07/15/2021	07/16/2021	07/19/2021	07/20/2021
PFAS with screening levels (ng/L)										
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.5 U	3.7 U	3.7 U	4 U	3.7 U	5 U	3.6 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	1.8 U	1.8 U	3.9	2 U	1.9 U	2.6 U	1.8 U
PFAS without screening levels (ng/L)										
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.5 U	3.7 U	3.7 U	4 U	3.7 U	5 U	3.6 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.5 U	3.7 U	3.7 U	4 U	3.7 U	5 U	3.6 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.5 U	3.7 U	3.7 U	4 U	3.7 U	5 U	3.6 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	3.5 U	3.7 U	3.7 U	12	3.7 U	5 U	3.6 U
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.5 UJ	3.7 UJ	3.7 U	4 U	3.7 U	5 U	3.6 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.5 U	3.7 U	3.7 U	4 U	3.7 U	5 U	3.6 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.5 U	3.7 U	3.7 U	4 U	3.7 U	5 U	3.6 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.5 U	3.7 U	3.7 U	4 U	3.7 U	5 U	3.6 U
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 UJ	2.6 U	1.8 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	1.8 U	1.8 U	1.9 U	2 U	1.9 U	2.6 U	1.8 U

TABLE 5-8: Summary of QA/QC Sample Results (continued)

PFAS Site Inspection for the Ames Research Center

Sample Location ID	CAS No.	USEPA Groundwater RSL	State ESL	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE
Sample ID				FB-11-072121	FB-12-072221	FB-13-072321	FB-14-072721	FB-15-072821	FB-16-072921	SWB-01-072021
Sample Date				07/21/2021	07/22/2021	07/23/2021	07/27/2021	07/28/2021	07/29/2021	07/20/2021
PFAS with screening levels (ng/L)										
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	13252-13-6	6	--	3.9 U	3.6 U	3.6 U	3.4 U	3.5 U	3.5 U	3.4 U
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	600	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	39	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUORONONANOIC ACID (PFNA)	375-95-1	5.9	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	6	5.1	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROOCTANESULFONIC ACID (PFOS)	1763-23-1	4	6.5	2 U	1.8 J	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PFAS without screening levels (ng/L)										
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	763051-92-9	--	--	3.9 U	3.6 U	3.6 U	3.4 U	3.5 U	3.5 U	3.4 U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	--	--	3.9 U	3.6 U	3.6 U	3.4 U	3.5 U	3.5 U	3.4 U
4:2 FLUOROTELOMER SULFONATE	757124-72-4	--	--	3.9 U	3.6 U	3.6 U	3.4 U	3.5 U	3.5 U	3.4 U
6:2 FLUOROTELOMER SULFONATE	27619-97-2	--	--	3.9 U	3.6 UJ	3.6 U	3.4 U	3.5 U	3.5 U	3.4 U
8:2 FLUOROTELOMER SULFONATE	39108-34-4	--	--	3.9 U	3.6 U	3.6 U	3.4 U	3.5 U	3.5 U	3.4 U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	756426-58-1	--	--	3.9 U	3.6 U	3.6 U	3.4 U	3.5 U	3.5 U	3.4 U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2991-50-6	--	--	3.9 U	3.6 U	3.6 U	3.4 U	3.5 U	3.5 U	3.4 U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	2355-31-9	--	--	3.9 U	3.6 U	3.6 U	3.4 U	3.5 U	3.5 U	3.4 UJ
PERFLUOROBUTANOIC ACID (PFBA)	375-22-4	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUORODECANESULFONIC ACID (PFDS)	335-77-3	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUORODECANOIC ACID (PFDA)	335-76-2	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUORODODECANOIC ACID (PFDOA)	307-55-1	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	375-92-8	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROHEXANOIC ACID (PFHXA)	307-24-4	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUORONONANESULFONIC ACID (PFNS)	68259-12-1	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROOCTANE SULFONAMIDE (FOSA)	754-91-6	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROPENTANESULFONIC ACID (PFPES)	2706-91-4	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROPENTANOIC ACID (PFPEA)	2706-90-3	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROTETRADECANOIC ACID (PFTEA)	376-06-7	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROTRIDECANOIC ACID (PFTRIA)	72629-94-8	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
PERFLUOROUNDECANOIC ACID (PFUNA)	2058-94-8	--	--	2 U	1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U

Highlighted cell indicates concentration is greater than screening criteria.

1 Data validation for sample ERB-02-072921 identified laboratory contamination issues during blank preparation or analysis. The sample was re-extracted and did not contain any contamination. Therefore, the original dataset shown on this table for this sample was not used for blank action assessment.

"--" = No criteria available.
EPA = Environmental Protection Agency.
ESL = Environmental Screening Level
ng/L = nanogram per liter.
PFAS = per- and polyfluoroalkyl substances
RSL = Regional Screening Level.
U = Not detected at or above the Limit of Qualitation (LOQ)
J = Estimated result < LOQ and > Detection Limit (DL)

FIGURE 5-1 SOIL RESULTS - AOPC 1 FORMER FIREFIGHTING TRAINING AREA (IR 10, 12, 20), AOPC 6 (HANGAR N211), AND AOPC 7 (FIRE DEPARTMENT, BUILDING 580)

PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER

ARC PFAS SI
Draft
August 2022

AOPC6-SB01	(0-0.5)	(0.5-2)
HFPO-DA	1.8 U	2.6 U
PFBS	0.36 J	0.29 J
PFHxS	12	92
PFNA	0.43 U	0.43 J
PFOA	0.45 J	5.1
PFOS	120	1900

AOPC1-SB02	(0-0.5)	(0.5-2)
HFPO-DA	1.8 U	2.4 U
PFBS	0.46 U	0.6 U
PFHxS	0.46 J	1.2
PFNA	0.46 U	0.6 J
PFOA	0.29 J	7.1
PFOS	11	2.5

AOPC1-SB01	(0-0.5)	(0.5-2)
HFPO-DA	1.9 U	2 U
PFBS	0.19 J	0.31 J
PFHxS	7.8	22
PFNA	0.29 J	0.71 J
PFOA	7	30
PFOS	61	40

AOPC1-SB03	(0-0.5)	(0.5-2)
HFPO-DA	1.8 U	2.3 U
PFBS	1.8	1.2
PFHxS	26	42
PFNA	0.45 U	0.55 U
PFOA	1.6	2.2
PFOS	300	920

AOPC 6
Hangar N248
(AOI 3 East)

AOPC7-SB02	(0-0.5)	(0.5-2)
HFPO-DA	2.5 U	2.2 U
PFBS	0.55 J	0.41 J
PFHxS	23	21
PFNA	2	2.6
PFOA	3	4.2
PFOS	300	1500

AOPC 7
Fire Department
(Building 580)

AOPC7-SB01	(0-0.5)	(0.5-2)
HFPO-DA	2.3 U	1.9 U
PFBS	0.55 U	0.48 U
PFHxS	5.6	4.8
PFNA	0.39 J	0.72 J
PFOA	1.4	1.1
PFOS	110	140

AOPC 1
Former Firefighting
Training Area
(IR 10, 12, 20)

AOPC1-SB04	(0-0.5)	(0.5-2)
HFPO-DA	2 U	2.2 U
PFBS	0.5 U	0.55 U
PFHxS	5.8	5.5
PFNA	0.26 J	0.55 U
PFOA	120	45
PFOS	22	6.2

USEPA Screening Levels	
Soil Criteria	RSL Residential
HFPO-DA	23
PFBS	1900
PFHxS	130
PFNA	19
PFOA	19
PFOS	13

0 175 350 700 Feet

Legend

- Soil Sample Location
- Storm Drain
- AOPC
- Site Boundary

Notes:
1. Depth interval shown in feet (0-0.5) and (0.5-2).
2. Soil results in µg/kg.
3. PFAS concentrations exceeding RSLs are in red font.

USEPA = U.S. Environmental Protection Agency
RSL = USEPA Regional Screening Level
J = Estimated Concentration
U = Below Detection Limits
µg/kg = micrograms per kilogram
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFBS = Perfluorobutanesulfonic acid
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexane sulfonate
HFPO-DA = Hexafluoropropylene oxide-dimer acid (commonly referred to as GenX)

PGH P:\GIS\AMES_NASA\MXD\FIG5-1_SOIL_RESULTS_AOPC01.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-2 SOIL PFAS RESULTS AT AOPC 2 CRASH SITE (SUNNYVALE GOLF COURSE)

PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER



PGH P:\GIS\AMES_NASA\MXD\FIG5-2_SOIL_RESULTS_AOPC02.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-3 SOIL PFAS RESULTS AT AOPC 23 HANGAR 4

PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER

ARC PFAS SI
Draft
August 2022

MF-APA-MW01	(0-0.5)	(0.5-2)
PFOA	ND	ND
PFOS	1	ND

MF-APA-SB02	(0-0.5)	(0.5-2)
PFOA	ND	ND
PFOS	ND	ND

3GWA13/A2	(0.0-2.0)	(2.0-4.0)	(4.0-6.0)
PFBS	<2.20	<2.10	<2.20
PFHxS	<2.20	<2.10	<2.20
PFNA	<2.20	<2.10	<2.20
PFOA	<2.20	<2.10	<2.20
PFOS	<2.20	<2.10	<2.20

MF-APA-SD03	(0-0.5)
PFOA	1.9
PFOS	1.9

AOPC 23
Hangar 4

MF-APA-SB03	(0-0.5)	(0.5-2)
PFOA	6.7	2.2
PFOS	ND	ND

2GWD1/D2	(0.0-2.0)	(2.0-4.0)	(4.0-6.0)
PFBS	<2.02	<2.08	<2.24
PFHxS	<2.02	<2.08	<2.24
PFNA	<2.02	<2.08	<2.24
PFOA	4.65	<2.08	6.08
PFOS	<2.02	<2.08	<2.24

MF-004-SB04	(0-0.5)	(0.5-2)
PFOA	6.6	16
PFOS	0.25	ND

MF-APA-SB04	(0-0.5)	(0.5-2)
PFOA	1	0.66
PFOS	9	1

MF-APA-SB05	(0-0.5)
PFOA	9.1
PFOS	0.48

MF-004-SB03	(0-0.5)	(0.5-2)
PFOA	3.3	11
PFOS	ND	ND

CANGVHS	(0.0-4.0)
PFOA	8.71
PFOS	13.2

MF-004-SB01	(0-0.5)
PFOA	3.7
PFOS	0.25

MF-002-SB02	(0-0.5)
PFOA	0.48
PFOS	0.35

USEPA Screening Levels	
Soil Criteria	RSL Residential
HFPO-DA	23
PFBS	1900
PFHxS	130
PFNA	19
PFOA	19
PFOS	13

0 50 100 200 Feet

Legend

- Soil Sample Location
- Site Boundary
- AOPC

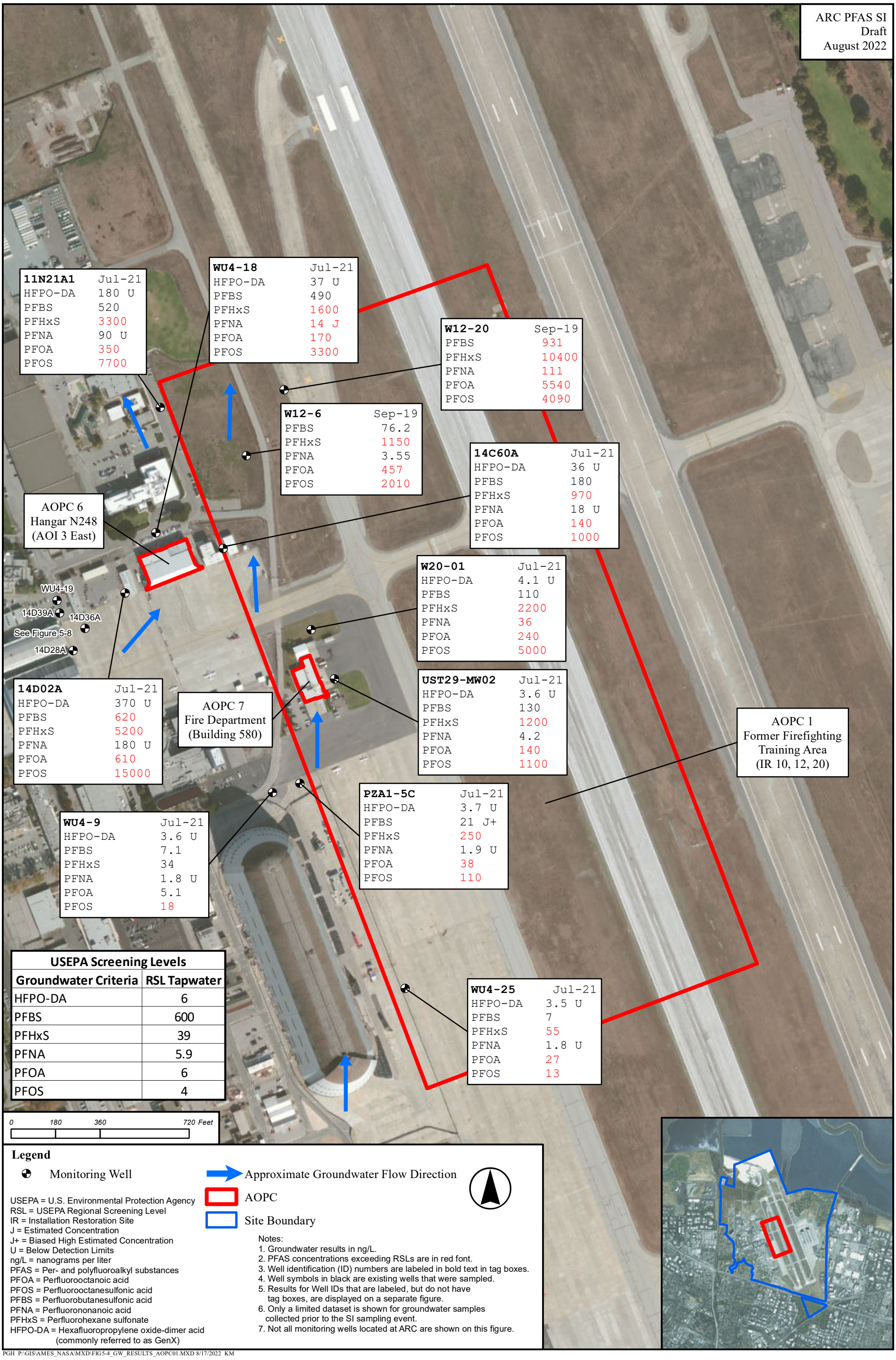
Notes:
1. Depth interval shown in feet (0-0.5) and (0.5-2).
2. Soil results in µg/kg.
3. PFAS concentrations exceeding RSLs are in red font.
4. Samples shown were collected prior to the SI. No additional samples were collected as part of the SI.
5. Data tag boxes only include a limited PFAS dataset from pre-SI sampling events.

USEPA = U.S. Environmental Protection Agency
RSL = USEPA Regional Screening Level
ND = Non-Detect
µg/kg = micrograms per kilogram
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFBS = Perfluorobutanesulfonic acid
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexane sulfonate
HFPO-DA = Hexafluoropropylene oxide-dimer acid (commonly referred to as GenX)

PGH P:\GIS\AMES_NASA\MXD\FIG5-3_SOIL_RESULTS_AOPC23.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-4 GROUNDWATER PFAS RESULTS AT AOPC 1 FORMER FIREFIGHTING TRAINING AREA (IR 10, 12, 20), AOPC 6 (HANGAR N211), AND AOPC 7 (FIRE DEPARTMENT, BUILDING 580)
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER



PGH P:\GIS\AMES_NASA\MXD\FIG5-4_GW_RESULTS_AOPC01.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-5 GROUNDWATER PFAS RESULTS AT AOPC 2 CRASH SITE (SUNNYVALE GOLF COURSE) AND AOPC 26 EASTERN BOUNDARY (IR 5)

PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER



PGH P:\GIS\AMES_NASA\MXD\FIG5-5_GW_RESULTS_AOPC02.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-6 GROUNDWATER PFAS RESULTS AT AOPC 3 HANGARS 2 & 3 (IR 7)
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER

ARC PFAS SI
Draft
August 2022

W4-14
WU5-10
See Figure 5-12
W6-5
W6-6

W7-9	Jul-21
HFPO-DA	4.2 U
PFBS	14
PFHxS	180
PFNA	11
PFOA	62
PFOS	160

W7-10	Jul-21
HFPO-DA	3.4 U
PFBS	0.87 J
PFHxS	10
PFNA	1.7 U
PFOA	4.6
PFOS	57

W7-3	Jul-21	Jul-21 (Dup)
HFPO-DA	3.7 U	3.5 U
PFBS	7.9	7.5
PFHxS	40	42
PFNA	1.9 U	1.8 U
PFOA	20	19
PFOS	33	30

W7-19 (could not locate)

W19-2	Jul-21
HFPO-DA	3.4 U
PFBS	1.7 U
PFHxS	8.1
PFNA	1.7 U
PFOA	4.1
PFOS	2.3 J

AOPC 3
Hangars 2 & 3 (IR 7)

W7-11	Jul-21
HFPO-DA	4 U
PFBS	13
PFHxS	65
PFNA	2 U
PFOA	19
PFOS	59

3/114-MW1 (could not locate)

UST3-MW-02	Jul-21
HFPO-DA	6.1 J
PFBS	13
PFHxS	57
PFNA	1.9 U
PFOA	15
PFOS	50

W7-13	Jul-21
HFPO-DA	3.5 U
PFBS	7.6
PFHxS	36
PFNA	1.6 J
PFOA	17
PFOS	23

Well B (could not be installed)

USEPA Screening Levels	
Groundwater Criteria	**RSL Tapwater**
HFPO-DA	6
PFBS	600
PFHxS	39
PFNA	5.9
PFOA	6
PFOS	4

0 85 170 340 Feet

Legend

- Monitoring Well
- Approximate Groundwater Flow Direction
- AOPC
- Site Boundary

USEPA = U.S. Environmental Protection Agency
RSL = USEPA Regional Screening Level
IR = Installation Restoration Site
J = Estimated Concentration
U = Below Detection Limits
ng/L = nanograms per liter
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFBS = Perfluorobutanesulfonic acid
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexane sulfonate
HFPO-DA = Hexafluoropropylene oxide-dimer acid (commonly referred to as GenX)

Notes:
1. Groundwater results in ng/L.
2. PFAS concentrations exceeding RSLs are in red font.
3. Well identification (ID) numbers are labeled in bold text in tag boxes.
4. Well symbols in black are existing wells that were sampled. Well symbols in gray could not be found or were not installed.
5. Results for Well IDs that are labeled, but do not have tag boxes, are displayed on a separate figure.
6. Wells UST3-MW-02 and W7-3 were sampled in place of the originally scoped wells 3/114-MW1 and W7-19, respectively, as those wells could not be found in the field.
7. A new well scoped on the south side of AOPC 3 (Well "B") could not be installed due to utilities in this area.
8. Not all monitoring wells located at ARC are shown on this figure.

PGH P:\GIS\AMES_NASA\MXD\FIG5-6_GW_RESULTS_AOPC03.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-7 GROUNDWATER PFAS RESULTS AT AOPC 4 FORMER ENGINE TEST STAND AREA (IR 11) AND SURFACE WATER RESULTS AT AOPC 11 BUILDING 191 PUMP STATION

PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER



USEPA Screening Levels	
Groundwater Criteria	**RSL Tapwater**
HFPO-DA	6
PFBS	600
PFHxS	39
PFNA	5.9
PFOA	6
PFOS	4
There are currently no USEPA screening levels for surface water.	

PGH P:\GIS\AMES_NASA\MXD\FIG5-7_GW_RESULTS_AOPC04.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-8 GROUNDWATER PFAS RESULTS AT AOPC 5 HANGAR N211 (WITHIN AOI 3 FORMERLY AOI 12)
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER

ARC PFAS SI
Draft
August 2022

WU4-19	Jul-21
HFPO-DA	3.5 U
PFBS	1500
PFHxS	4400
PFNA	7.6
PFOA	330
PFOS	3300

14D39A	Jul-21
HFPO-DA	3.9 U
PFBS	310
PFHxS	3900
PFNA	8.7 J+
PFOA	250
PFOS	40000

14D36A	Jul-21
HFPO-DA	3.7 U
PFBS	320
PFHxS	3000
PFNA	3.8 J-
PFOA	380
PFOS	23000

14D28A	Jul-21
HFPO-DA	3.6 U
PFBS	69
PFHxS	780
PFNA	2.4 J
PFOA	77
PFOS	5400

WNB-14	Jul-21
HFPO-DA	3.8 U
PFBS	29
PFHxS	220
PFNA	27
PFOA	120
PFOS	410

AOPC 5
Hangar N211
(within AOI 3,
formerly AOI 12)

14D12A	Jul-21	Dup
HFPO-DA	3.7 U	3.8 U
PFBS	11	12
PFHxS	24	25
PFNA	6.6	7.5
PFOA	8.3	8.3
PFOS	14	16

REG-6A PIE
(could not locate)

USEPA Screening Levels	
Groundwater Criteria	RSL Tapwater
HFPO-DA	6
PFBS	600
PFHxS	39
PFNA	5.9
PFOA	6
PFOS	4

0 32.5 65 130 Feet

Legend

Monitoring Well

Approximate Groundwater Flow Direction

AOPC

Site Boundary

USEPA = U.S. Environmental Protection Agency
RSL = USEPA Regional Screening Level
IR = Installation Restoration Site
J = Estimated Concentration
J+ = Biased High Estimated Concentration
J- = Biased Low Estimated Concentration
U = Below Detection Limits
ng/L = nanograms per liter
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFBS = Perfluorobutanesulfonic acid
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexane sulfonate
HFPO-DA = Hexafluoropropylene oxide-dimer acid (commonly referred to as GenX)

Notes:
1. Groundwater results in ng/L.
2. PFAS concentrations exceeding RSLs are in red font.
3. Well identification (ID) numbers are labeled in bold text in tag boxes.
4. Well symbols in black are existing wells that were sampled.
   Well symbols in gray could not be found or were not installed.
5. Well REG-6A PIE was originally scoped for sampling but could not be found in the field. No replacement well was identified for sampling as nearby well, 14D12A, was able to be sampled.
6. Not all monitoring wells located at ARC are shown on this figure.

PGH P:\GIS\AMES_NASA\MXD\FIG5-8_GW_RESULTS_AOPC05.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-9 GROUNDWATER PFAS RESULTS AT AOPC 8 SITE 1 RUNWAY LANDFILL (IR 1)
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER

ARC PFAS SI
Draft
August 2022

W1-5	Jul-21
HFPO-DA	3.6 U
PFBS	1.8 U
PFHxS	1.4 J
PFNA	1.8 U
PFOA	1.8 U
PFOS	1.8 U

AOPC 8
Site 1 Runway
Landfill (IR 1)

W1-14	Jul-21
HFPO-DA	3.5 U
PFBS	6.9
PFHxS	6.3
PFNA	1.8 U
PFOA	6.5
PFOS	2.8 J

W1-20	Jul-21
HFPO-DA	3.5 U
PFBS	1.7 U
PFHxS	1.4 J
PFNA	1.7 U
PFOA	110 J
PFOS	1.7 U

W1-19	Jul-21	Dup
HFPO-DA	3.5 U	3.6 U
PFBS	1.8 U	1.8 U
PFHxS	1.8 U	1.8 U
PFNA	1.8 U	1.8 U
PFOA	1.8 U	1.8 U
PFOS	1.8 U	1.8 U

W1-1R	Jul-21
HFPO-DA	3.4 U
PFBS	1.7 U
PFHxS	1.7 U
PFNA	1.7 U
PFOA	1.7 U
PFOS	1.7 U

USEPA Screening Levels	
Groundwater Criteria	RSL Tapwater
HFPO-DA	6
PFBS	600
PFHxS	39
PFNA	5.9
PFOA	6
PFOS	4

0 67.5 135 270 Feet

Legend

Monitoring Well | AOPC | Site Boundary

USEPA = U.S. Environmental Protection Agency
RSL = USEPA Regional Screening Level
IR = Installation Restoration Site
J = Estimated Concentration
U = Below Detection Limits
ng/L = nanograms per liter
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFBS = Perfluorobutanesulfonic acid
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexane sulfonate
HFPO-DA = Hexafluoropropylene oxide-dimer acid (commonly referred to as GenX)

Notes:
1. Groundwater results in ng/L.
2. PFAS concentrations exceeding RSLs are in red font.
3. Well identification (ID) numbers are labeled in bold text in tag boxes.
4. Well symbols in black are existing wells that were sampled.
5. Not all monitoring wells located at ARC are shown on this figure.

PGH P:\GIS\AMES_NASA\MXD\FIG5-9_GW_RESULTS_AOPC08.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-10 GROUNDWATER PFAS RESULTS AT AOPC 9 FORMER GOLF COURSE LANDFILL (IR 2), AND AOPC 16 NORTH PATROL ROAD DITCH (IR 21) / NORTHERN CHANNEL (IR 27)
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER

ARC PFAS SI
Draft
August 2022

W2-13	Jul-21
HFPO-DA	3.7 U
PFBS	21
PFHxS	110
PFNA	1.9 U
PFOA	32
PFOS	9.1

W2-16	Jul-21
HFPO-DA	3.6 U
PFBS	67
PFHxS	500
PFNA	5.9
PFOA	230
PFOS	500

WU5-9	Jul-21
HFPO-DA	6.5 U
PFBS	6.6
PFHxS	40
PFNA	3.3 U
PFOA	44
PFOS	47

WGC2-5	Jul-21
HFPO-DA	3.5 U
PFBS	1.9 J
PFHxS	4.5
PFNA	1.8 U
PFOA	11
PFOS	2.4 J

WGC2-4	Jul-21
HFPO-DA	3.7 U
PFBS	31
PFHxS	25
PFNA	2.1 J
PFOA	17
PFOS	34

WGC2-12	Jul-21	Jul-21 (Dup)
HFPO-DA	3.6 U	3.6 U
PFBS	1.1 J	1.2 J
PFHxS	5.4	5
PFNA	1.8 U	1.8 U
PFOA	3.7	3.2 J
PFOS	1.8 U	1.8 U

W2-12	Jul-21
HFPO-DA	3.6 U
PFBS	19
PFHxS	110
PFNA	1.8 U
PFOA	48
PFOS	89

See Figure 5-7
W11-2
PFAS-H
W2-2A (could not locate)
AOPC 9 Former Golf Course Landfill (IR 2)
WGC2-8
WGC2-10
WGC2-11
WGC2-1
WGC2-6
WGC2-13
W3-8
See Figure 5-11
W3-20
W3-1
See Figure 5-12
W4-6
EXW-4
WSW-5
WU5-12
WU5-10
W4-14
W6-5
W6-6
W7-9
W7-10
W19-2
See Figure 5-6
W7-11
W7-13
AOPC 16 North Patrol Road Ditch (IR 21)/Northern Channel (IR 27)
W5-3
See Figure 5-5

USEPA Screening Levels	
Groundwater Criteria	**RSL Tapwater**
HFPO-DA	6
PFBS	600
PFHxS	39
PFNA	5.9
PFOA	6
PFOS	4

0 500 1,000 2,000 Feet

Legend

- Monitoring Well
- Approximate Groundwater Flow Direction
- AOPC
- Site Boundary

USEPA = U.S. Environmental Protection Agency
RSL = USEPA Regional Screening Level
IR = Installation Restoration Site
J = Estimated Concentration
U = Below Detection Limits
ng/L = nanograms per liter
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFBS = Perfluorobutanesulfonic acid
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexane sulfonate
HFPO-DA = Hexafluoropropylene oxide-dimer acid (commonly referred to as GenX)

Notes:
1. Groundwater results in ng/L.
2. PFAS concentrations exceeding RSLs are in red font.
3. Well identification (ID) numbers are labeled in bold text in tag boxes.
4. Well symbols in black are existing wells that were sampled. Well symbols in gray could not be found or were not installed.
5. Results for Well IDs that are labeled, but do not have tag boxes, are displayed on a separate figure.
6. Well W2-12 was sampled in place of the originally scoped well, W2-2A, as this well could not be found in field.
7. Not all monitoring wells located at ARC are shown on this figure.

PGH P:\GIS\AMES_NASA\MXD\FIG5-10_GW_RESULTS_AOPC09.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-11 GROUNDWATER RESULTS AT AOPC 10 SITE 22 LANDFILL (IR 22)
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER

ARC PFAS SI
Draft
August 2022

WGC2-8	Jul-21
HFPO-DA	3.4 U
PFBS	5.4
PFHxS	37
PFNA	1.7 U
PFOA	41
PFOS	53

WGC2-5	Jul-21
HFPO-DA	3.5 U
PFBS	1.9 J
PFHxS	4.5
PFNA	1.8 U
PFOA	11
PFOS	2.4 J

WGC2-4	Jul-21
HFPO-DA	3.7 U
PFBS	31
PFHxS	25
PFNA	2.1 J
PFOA	17
PFOS	34

WGC2-12	Jul-21	Jul-21 (Dup)
HFPO-DA	3.6 U	3.6 U
PFBS	1.1 J	1.2 J
PFHxS	5.4	5
PFNA	1.8 U	1.8 U
PFOA	3.7	3.2 J
PFOS	1.8 U	1.8 U

WGC2-10	Jul-21
HFPO-DA	3.9 U
PFBS	29
PFHxS	26
PFNA	2.7 J
PFOA	24
PFOS	9.1

AOPC 10
Site 22
Landfill
(IR 22)

WGC2-6	Jul-21
HFPO-DA	3.9 U
PFBS	1.6 J
PFHxS	2.2 J
PFNA	1.9 U
PFOA	1 J
PFOS	1.9 U

WGC2-13	Jul-21
HFPO-DA	3.7 U
PFBS	16
PFHxS	17
PFNA	1.9 U
PFOA	1.9 U
PFOS	1.4 J

WGC2-11	Jul-21
HFPO-DA	3.7 U
PFBS	37
PFHxS	120
PFNA	1.9 U
PFOA	8.3
PFOS	32

WGC2-1	Jul-21
HFPO-DA	4 U
PFBS	18
PFHxS	26
PFNA	2 U
PFOA	4.7
PFOS	4.5

LGMW-1
(could not locate)

USEPA Screening Levels	
Groundwater Criteria	RSL Tapwater
HFPO-DA	6
PFBS	600
PFHxS	39
PFNA	5.9
PFOA	6
PFOS	4

0 87.5 175 350 Feet

Legend

- Monitoring Well
- Approximate Groundwater Flow Direction
- AOPC
- Site Boundary

USEPA = U.S. Environmental Protection Agency
RSL = USEPA Regional Screening Level
IR = Installation Restoration Site
J = Estimated Concentration
U = Below Detection Limits
ng/L = nanograms per liter
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFBS = Perfluorobutanesulfonic acid
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexane sulfonate
HFPO-DA = Hexafluoropropylene oxide-dimer acid (commonly referred to as GenX)

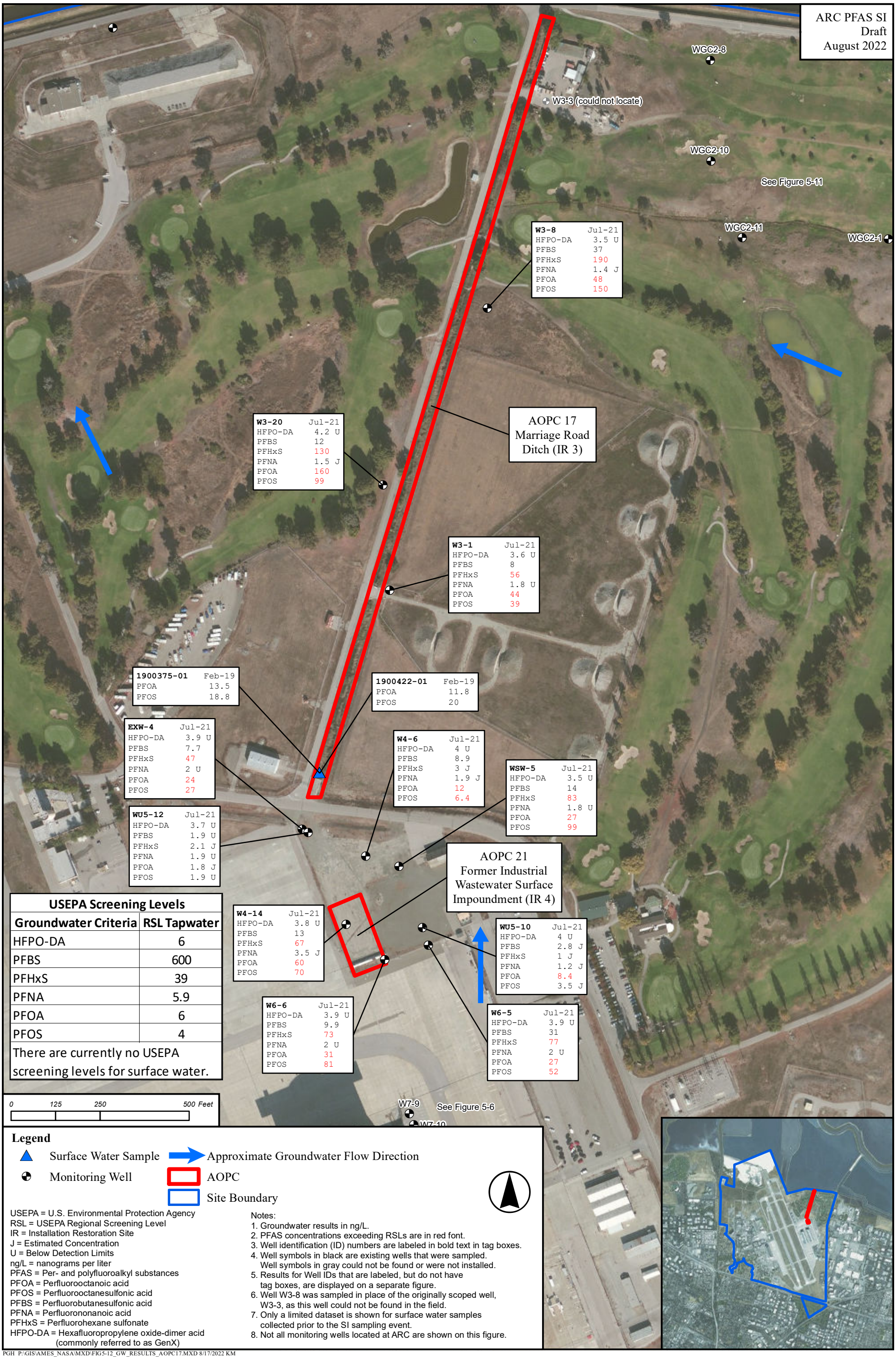
Notes:
1. Groundwater results in ng/L.
2. PFAS concentrations exceeding RSLs are in red font.
3. Well identification (ID) numbers are labeled in bold text in tag boxes.
4. Well symbols in black are existing wells that were sampled. Well symbols in gray could not be found or were not installed.
5. Well WGC2-1 was sampled in place of the originally scoped well, LGMW-1, as this well could not be found in the field
6. Not all monitoring wells located at ARC are shown on this figure.

PGH P:\GIS\AMES_NASA\MXD\FIG5-11_GW_RESULTS_AOPC10.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-12 GROUNDWATER AND SURFACE WATER PFAS RESULTS AT AOPC 17 MARRIAGE ROAD DITCH (IR 3) AND AOPC 21 FORMER INDUSTRIAL WASTEWATER SURFACE IMPOUNDMENT (IR 4)

PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER



USEPA Screening Levels	
Groundwater Criteria	**RSL Tapwater**
HFPO-DA	6
PFBS	600
PFHxS	39
PFNA	5.9
PFOA	6
PFOS	4
There are currently no USEPA screening levels for surface water.	

Legend

- Surface Water Sample
- Monitoring Well
- Approximate Groundwater Flow Direction
- AOPC
- Site Boundary

USEPA = U.S. Environmental Protection Agency
RSL = USEPA Regional Screening Level
IR = Installation Restoration Site
J = Estimated Concentration
U = Below Detection Limits
ng/L = nanograms per liter
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFBS = Perfluorobutanesulfonic acid
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexane sulfonate
HFPO-DA = Hexafluoropropylene oxide-dimer acid (commonly referred to as GenX)

Notes:
1. Groundwater results in ng/L.
2. PFAS concentrations exceeding RSLs are in red font.
3. Well identification (ID) numbers are labeled in bold text in tag boxes.
4. Well symbols in black are existing wells that were sampled. Well symbols in gray could not be found or were not installed.
5. Results for Well IDs that are labeled, but do not have tag boxes, are displayed on a separate figure.
6. Well W3-8 was sampled in place of the originally scoped well, W3-3, as this well could not be found in the field.
7. Only a limited dataset is shown for surface water samples collected prior to the SI sampling event.
8. Not all monitoring wells located at ARC are shown on this figure.

PGH P:\GIS\AMES_NASA\MXD\FIG5-12_GW_RESULTS_AOPC17.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-13 GROUNDWATER PFAS RESULTS AT AOPC 18 LINDBERGH AVENUE STORM DRAIN DITCH (AOI 6) AND AOPC 22 BUILDING N249, OUTDOOR AERODYNAMIC RESEARCH FACILITY
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER

ARC PFAS SI
Draft
August 2022

11E02A	Jul-21
HFPO-DA	3.5 U
PFBS	18
PFHxS	120
PFNA	2.9 J
PFOA	34
PFOS	470

AOPC 22
Building N249
Outdoor Aerodynamic
Research Facility

10J02A	Jul-21	Jul-21 (Dup)
HFPO-DA	3.4 U	3.4 U
PFBS	7.9	7.6
PFHxS	38	39
PFNA	1.7 U	1.7 U
PFOA	1.9 J	2.2 J
PFOS	15 J	22 J

WNB-7	Jul-21
HFPO-DA	3.9 U
PFBS	12
PFHxS	32
PFNA	2 U
PFOA	1.6 J
PFOS	55

10J021A	Jul-21
HFPO-DA	3.8 U
PFBS	11
PFHxS	56
PFNA	1.9 U
PFOA	1.5 J
PFOS	15

AOPC 18
Lindbergh Avenue
Storm Drain
Ditch (AOI 6)

PFAS-A	Jul-21
HFPO-DA	3.6 U
PFBS	22
PFHxS	220
PFNA	0.91 J
PFOA	25
PFOS	150

USEPA Screening Levels	
Groundwater Criteria	RSL Tapwater
HFPO-DA	6
PFBS	600
PFHxS	39
PFNA	5.9
PFOA	6
PFOS	4

0 100 200 400 Feet

Legend

- Monitoring Well
- Approximate Groundwater Flow Direction
- AOPC
- Site Boundary

USEPA = U.S. Environmental Protection Agency
RSL = USEPA Regional Screening Level
IR = Installation Restoration Site
J = Estimated Concentration
U = Below Detection Limits
ng/L = nanograms per liter
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFBS = Perfluorobutanesulfonic acid
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexane sulfonate
HFPO-DA = Hexafluoropropylene oxide-dimer acid (commonly referred to as GenX)

Notes:
1. Groundwater results in ng/L.
2. PFAS concentrations exceeding RSLs are in red font.
3. Well identification (ID) numbers are labeled in bold text in tag boxes.
4. Well symbols in black are existing wells that were sampled.
5. Not all monitoring wells located at ARC are shown on this figure.

PGH P:\GIS\AMES_NASA\MXD\FIG5-13_GW_RESULTS_AOPC18.MXD 8/23/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-14 GROUNDWATER PFAS RESULTS AT AOPC 24 MEW PLUME
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER

ARC PFAS SI
Draft
August 2022

11E02A
W2-16
W2-13
See Figure 5-10
W2-12
See Figure 5-13
10J02A
10J01A
WNB-7
PFAS-A
11N21A1
W12-20
W12-6
WU4-18
14C60A
See Figure 5-4
WU4-19
14D02A
14D39A
14D36A
14D28A
W20-01
WNB-14
UST29-MW02
See Figure 5-8
15H12A
See Figure 5-15
15B10A
14D12A
PZA1-5C
WU4-9
AOPC 24
MEW Plume
WU4-25

171A	Jul-21
HFPO-DA	3.8 U
PFBS	6.2
PFHxS	7
PFNA	1.9 U
PFOA	2.7 J
PFOS	4.2

W89-1	Jul-21
HFPO-DA	3.7 U
PFBS	40
PFHxS	130
PFNA	1.8 U
PFOA	11
PFOS	57

WU4-1	Jul-21
HFPO-DA	4.4 U
PFBS	8.4
PFHxS	25
PFNA	2.2 U
PFOA	3.3 J
PFOS	8

64A	Jul-21
HFPO-DA	3.9 U
PFBS	5.7
PFHxS	11
PFNA	1.9 U
PFOA	1.9 U
PFOS	3.8

USEPA Screening Levels	
Groundwater Criteria	RSL Tapwater
HFPO-DA	6
PFBS	600
PFHxS	39
PFNA	5.9
PFOA	6
PFOS	4

0 325 650 1,300 Feet

Legend

- Monitoring Well
- Approximate Groundwater Flow Direction
- AOPC
- Site Boundary

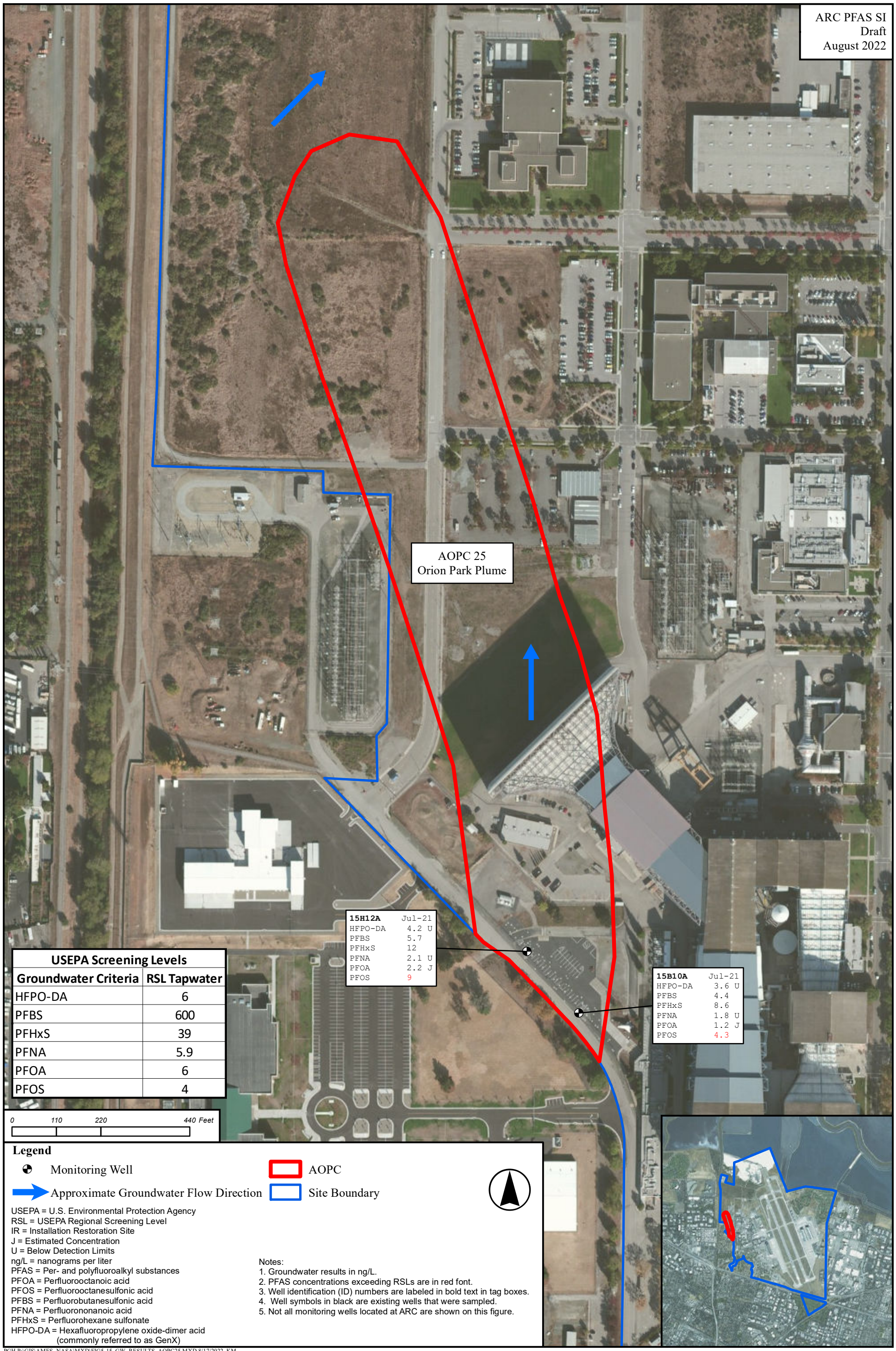
USEPA = U.S. Environmental Protection Agency
RSL = USEPA Regional Screening Level
IR = Installation Restoration Site
J = Estimated Concentration
U = Below Detection Limits
ng/L = nanograms per liter
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PFBS = Perfluorobutanesulfonic acid
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexane sulfonate
HFPO-DA = Hexafluoropropylene oxide-dimer acid (commonly referred to as GenX)

Notes:
1. Groundwater results in ng/L.
2. PFAS concentrations exceeding RSLs are in red font.
3. Well identification (ID) numbers are labeled in bold text in tag boxes.
4. Well symbols in black are existing wells that were sampled.
5. Results for Well IDs that are labeled, but do not have tag boxes, are displayed on a separate figure.
6. Not all monitoring wells located at ARC are shown on this figure.

PGH P:\GIS\AMES_NASA\MXD\FIG5-14_GW_RESULTS_AOPC24.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-15 GROUNDWATER PFAS RESULTS AT AOPC 25 ORION PARK PLUME
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER

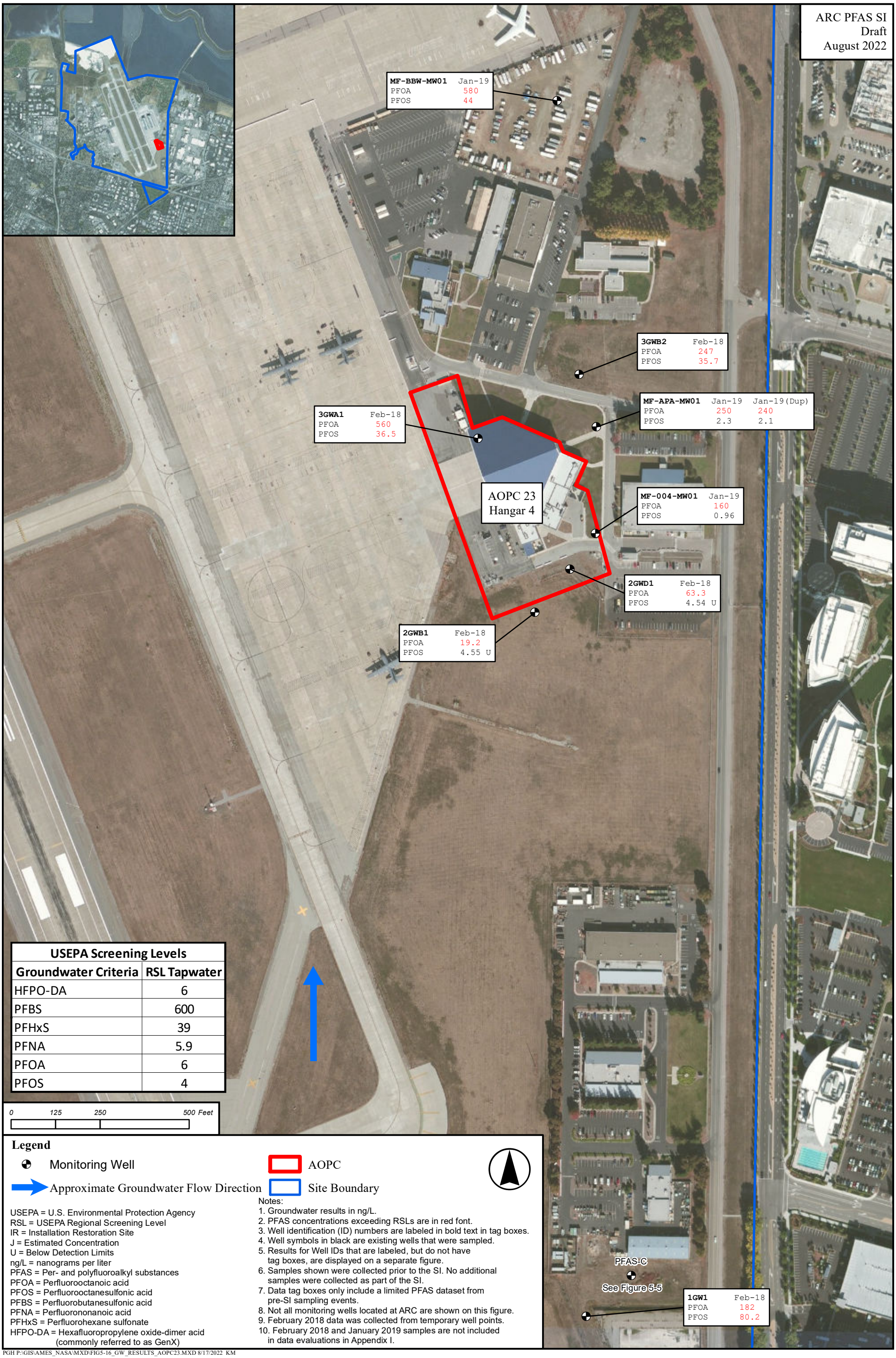


PGH P:\GIS\AMES_NASA\MXD\FIG5-15_GW_RESULTS_AOPC25.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-16 GROUNDWATER PFAS RESULTS AT AOPC 23 HANGAR 4

PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER



PGH P:\GIS\AMES_NASA\MXD\FIG5-16_GW_RESULTS_AOPC23.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-17 SURFACE WATER PFAS RESULTS AT AOPC 13 NASA GROUNDWATER EXTRACTION TREATMENT SYSTEM, AOPC 14 MEW GROUNDWATER EXTRACTION TREATMENT SYSTEM AND AOPC 20 BUILDING N271 INDUSTRIAL WASTEWATER TREATMENT PLANT
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER



PGH P:\GIS\AMES_NASA\MXD\FIG5-17_SW_RESULTS_AOPC13_14.MXD 8/17/2022 KM

Aerial: ESRI World Imagery (Clarity)

FIGURE 5-18 SURFACE WATER PFAS RESULTS AT AOPC 12 STORMWATER SETTLING BASIN/EASTERN DIKED MARSH (WITHIN IR 25), AOPC 15 WEST-SIDE AQUIFERS TREATMENT SYSTEM, AND AOPC 19 STORMWATER RETENTION PONDS (WITHIN IR 25)
PFAS SITE INSPECTION FOR THE AMES RESEARCH CENTER



PGH:P:\GIS\AMES_NASA\MXD\FIG5-18_SW_RESULTS_AOPC12_15_19.MXD 8/17/2022

Aerial: ESRI World Imagery (Clarity)

SECTION 6
CONCLUSIONS AND RECOMMENDATIONS

During the SI, each identified potential source area was inspected for presence of PFAS as specified in the SIWP. PFAS concentrations in sampled media were compared to screening levels, as applicable, to determine whether further investigation would be warranted. PFAS concentrations exceeding screening levels were detected in samples at all AOPCs sampled for soil or groundwater or both. Conclusions and recommendations for each medium and AOPC are below and summarized in Table 6-1.

Conclusions that follow compare detected concentrations of PFAS to State of California ESLs and USEPA RSLs. Figure 5-1 through Figure 5-18 compare detected concentrations of PFAS to USEPA RSLs only, as applicable, for soil and groundwater (USEPA screening levels have not been established for surface water).

Recommendations that follow are based on the conclusions, and the following potential steps for each AOPC:

1. **PRP Analysis**. Multiple parties may be associated with the PFAS levels found at each AOPC. A PRP analysis would help determine responsibility and allocation of future costs of investigation based on past history and information presented in this SI report. PRP analysis should be done in accordance with *NASA Procedures Requirements 8590.A*, *Environmental Compliance and Restoration Program,* Section 4.3.1.f. though Section 4.3.1.i. The process that must be followed for this PRP analysis is described in "*The Guidance for Implementation of Environmental Compliance and Restoration Program Requirements Defined in NASA Procedural Requirements 8590.1A*." Appendix D of this guidance includes a PRP Analysis Checklist that should be used in these efforts.

2. **Further Investigation:** Based on the technical conclusions in this SI, general technical recommendations for further investigation are offered in the following sections for each AOPC.

6.1 AOPC 1 – FORMER FIREFIGHTING TRAINING AREA (IR 10, 12, 20)

Conclusions

Soil samples were collected at four locations, with a surface (0 to 0.5 feet bgs) and subsurface (0.5 to 2 feet bgs) soil sample collected at each location, for a total of eight soil samples. Seventeen of the 28 PFAS were detected in soil samples from AOPC 1. PFOS was detected at concentrations exceeding the soil RSL of 13 µg/kg in five samples and above the human health and ecologic ESLs of 12 and 13 µg/kg, respectively, in five samples. PFOA was detected at concentrations exceeding the human health ESL of 3.8 µg/kg in five samples. PFOA concentration exceeded the ecologic ESL of 84 µg/kg in one sample. PFOA concentrations exceeded the soil RSL of 19 µg/kg in three samples. PFNA, PFHxS, HFPO-DA, and PFBS concentrations did not exceed RSLs.

Groundwater samples were collected at seven existing monitoring well locations during the SI. Seventeen of the 28 PFAS were detected in groundwater samples from AOPC 1. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in six samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in seven samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in six samples. PFNA was detected at concentration exceeding the groundwater RSL of 5.9 ng/L in one sample. There were no PFBS screening level exceedances, and the highest concentration detected was 520 ng/L. HFPO-DA was non-detect in all samples.

Prior to the SI, some groundwater samples were collected at AOPC 1. During the September 2019 sampling event, groundwater samples were collected at two locations at AOPC 1. Sixteen of the 24 PFAS analytes were detected in the samples collected during this event. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in both samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in both samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in both samples. PFNA was detected at concentration exceeding the groundwater RSL of 5.9 ng/L in one sample. PFBS was detected at concentration exceeding the groundwater RSL of 600 ng/L in one sample.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA, the Navy, and CANG are all possible contributors to PFAS releases at AOPC 1.

- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater and soil is recommended.

6.2 AOPC 2 – CRASH SITE (SUNNYVALE GOLF COURSE)

Conclusions

Soil samples were collected at seven locations, with a surface (0 to 0.5 feet bgs) and subsurface (0.5 to 2 feet bgs) soil sample collected at each location, for a total of 14 soil samples. Thirteen of the 28 PFAS were detected in soil samples from AOPC 2. PFOS was detected at concentrations exceeding the RSL, human health, and ecologic ESLs in four samples. PFOA was detected at concentrations exceeding the human health ESL of 3.8 µg/kg in four samples. PFBS, PFHxS, and PFNA were not detected above screening criteria. HFPO-DA was non-detect in all samples.

Groundwater samples were collected at five locations. Eleven of the 28 PFAS were detected in groundwater samples from AOPC 2. PFOS was detected at concentrations exceeding the groundwater ESL of 6.5 ng/L and the groundwater RSL of 4 ng/L in three samples. Concentrations of PFOA, PFBS, PFNA, and PFHxS did not exceed screening values. HFPO-DA was non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 2.

- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater and soil is recommended.

6.3 AOPC 3 – HANGARS 2 AND 3 (IR 7)

Conclusions

Groundwater samples were collected at seven locations within AOPC 3. Nineteen of the 28 PFAS were detected in groundwater samples from AOPC 3. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in six samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL in seven samples. PFNA was detected at concentration exceeding the groundwater RSL of 5.9 ng/L in one sample. HFPO-DA was detected at concentration exceeding the groundwater RSL of 6 ng/L in one sample. PFHxS was detected at concentration exceeding the groundwater RSL of 39 ng/L in five samples. PFBS was not detected above the screening level in any sample.

Recommendations

- PRP Analysis: Preliminary information indicates that the Navy and CANG are possible contributors to PFAS releases at AOPC 3.
- Further Investigation: Further investigation of horizontal and vertical extents of PFAS in groundwater is recommended.

6.4 AOPC 4 – FORMER ENGINE TEST STAND AREA (IR 11)

Conclusions

Groundwater samples were collected at AOPC 4 at two locations. Nine of the 28 PFAS were detected in groundwater samples from AOPC 4. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and groundwater ESL of 5.1 ng/L in both samples. There were no screening level exceedances for PFBS, PFHxS, or PFOS. PFNA and HFPO-DA were non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 4.

- Further Investigation: Further investigation of horizontal and vertical extents of PFAS in groundwater is recommended.

6.5 AOPC 5 – HANGAR N211 (WITHIN AOI 3, FORMERLY AOI 12)

Conclusions

Groundwater samples were collected at six locations within AOPC 5. Nineteen of the 28 PFAS were detected in groundwater samples from AOPC 5. PFBS was detected in one sample at concentration exceeding the groundwater RSL of 600 ng/L. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in seven samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in seven samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in five samples. PFNA was detected at concentrations exceeding the groundwater RSL of 5.9 ng/L in five samples. HFPO-DA was non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA is the possible contributor to PFAS releases at AOPC 5.

- Further Investigation: Further investigation of horizontal and vertical extents of PFAS in groundwater is recommended.

6.6 AOPC 6 – HANGAR N248 (AOI 3 EAST)

Conclusions

Soil samples were collected at one location, which included a surface (0 to 0.5 feet bgs) and subsurface (0.5 to 2 feet bgs) soil samples, for a total of two samples. Twenty-one of the 28 PFAS were detected in soil samples from AOPC 6. PFOS was detected at concentrations exceeding the RSL of 13 µg/kg and the human health and ecologic ESLs of 12 and 13 µg/kg, respectively, in both samples. PFOA was detected at concentration exceeding the human health

ESL of 3.8 µg/kg in one sample. PFBS, PFNA, and PFHxS concentrations did not exceed screening levels. HFPO-DA was non-detect in all samples.

Groundwater samples were collected at three locations within AOPC 6. Thirteen of the 28 PFAS were detected in groundwater samples from AOPC 6. PFBS was detected at concentration exceeding the groundwater RSL of 600 ng/L in one sample. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in all three samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in all three samples. PFHxS concentrations exceeded the groundwater RSL of 39 ng/L in three samples, and PFNA concentration exceeded the groundwater RSL of 5.9 ng/L in one sample. HFPO-DA was non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA is the possible contributor to PFAS releases at AOPC 6.
- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater and soil is recommended.

6.7 AOPC 7 – FIRE DEPARTMENT (BUILDING 580)

Conclusions

Soil samples were collected at AOPC 7 at two locations, each of which included a surface (0 to 0.5 feet bgs) and subsurface (0.5 to 2 feet bgs) soil sample, for a total of four soil samples. Eighteen of the 28 PFAS were detected in soil samples from AOPC 7. PFOS was detected at concentrations exceeding the soil RSL of 13 µg/kg and the human health and ecologic ESLs of 12 and 13 µg/kg, respectively, in all four samples. PFOA was detected at a concentration exceeding the human health ESL of 3.8 µg/kg in one sample. PFHxS, PFNA, and PFBS concentrations did not exceed screening levels. HFPO-DA was non-detect in all samples.

Groundwater samples were collected at five locations within AOPC 7. Seventeen of the 28 PFAS were detected in groundwater samples from AOPC 7. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples.

PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples. PFHxS exceeded the groundwater RSL of 39 ng/L in four samples, and PFNA exceeded the groundwater RSL of 5.9 ng/L in one sample. PFBS concentrations did not exceed any screening levels. HFPO-DA was non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA, the Navy, and CANG are all possible contributors to PFAS releases at AOPC 7.

- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater and soil is recommended. For the purposes of further investigation, AOPC 7 will be subsumed into AOPC 1 as the PFAS and potential source of PFAS are the same or similar, and AOPC 7 is within AOPC 1.

6.8 AOPC 8 – SITE 1 RUNWAY LANDFILL (IR 1)

Conclusions

Groundwater samples were collected at five locations within AOPC 8. Ten of the 28 PFAS were detected in groundwater samples from AOPC 8. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in two samples. PFOS, PFBS, and PFHxS concentrations did not exceed any screening levels. PFNA and HFPO-DA were non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 8.

- Further Investigation: Further investigation of horizontal and vertical extents of PFAS in groundwater is recommended.

6.9 AOPC 9 – SITE 2 FORMER GOLF COURSE LANDFILL (IR 2)

Conclusions

Groundwater samples were collected at three locations within AOPC 9. Thirteen of the 28 PFAS were detected in groundwater samples from AOPC 9. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in three samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in three samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in three samples. PFBS and PFNA concentrations did not exceed any screening levels. HFPO-DA was non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 9.
- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

6.10 AOPC 10 – SITE 22 LANDFILL (IR 22)

Conclusions

Groundwater samples were collected at nine locations within AOPC 10. Thirteen of the 28 PFAS were detected in groundwater samples from AOPC 10. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in five samples. PFOS was detected at a concentration exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples. PFHxS was detected at concentration exceeding the groundwater RSL of 39 ng/L in one sample. PFBS and PFNA concentrations did not exceed any screening levels. HFPO-DA was non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 10.

- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

6.11 AOPC 11 – BUILDING 191 PUMP STATION

Conclusions

One surface water sample was collected at AOPC 11. PFNA was detected at concentration of 13 ng/L, PFHxS was detected at 930 ng/L, PFBS was detected at 130 ng/L, PFOA was detected at 340 ng/L, and PFOS was detected at 1,400 ng/L. HFPO-DA was not detected in the sample. No screening levels for surface water have been established.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA, the Navy, and CANG are all possible contributors to PFAS releases at AOPC 11.

- Further Investigation: Further investigation of the presence of PFAS in surface water is recommended, including the possibility of a pathway between AOPC 11 (Building 191 Pump Station), AOPC 16 (North Patrol Road Ditch and Northern Channel), and AOPC 17 (Marriage Road Ditch).

6.12 AOPC 12 - STORMWATER SETTLING BASIN/EASTERN DIKED MARSH (WITHIN IR 25)

Conclusions

One surface water sample was collected at AOPC 12. PFBS was detected at concentration of 4 ng/L, PFOA was detected at estimated concentration of 1.1 ng/L, PFHxS was detected at 6 ng/L, and PFOS was detected at 5.5 ng/L. HFPO-DA and PFNA were not detected in the sample. No screening levels for surface water have been established.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA and the Navy are possible contributors to PFAS releases at AOPC 12.

- Further Investigation: Further investigation of the sources and extent of PFAS in surface water in AOPC 12 is recommended.

6.13 AOPC 13 – NASA GROUNDWATER EXTRACTION TREATMENT SYSTEM

Conclusions

One influent and one effluent sample were collected at AOPC 13. Eleven of the 28 PFAS were detected in the samples from AOPC 13. These results were compared to USEPA and State groundwater screening levels for evaluation purposes only. Concentrations in the influent sample exceeded the groundwater RSLs for PFOS, PFHxS, and PFOA, as well as the groundwater ESLs for PFOS and PFOA. Concentrations of PFOS in the effluent sample exceeded the groundwater RSL of 4 ng/L; however, the concentration in the duplicate sample was under the RSL. At ARC, treated water from NASA GWETS (AOPC 13) and MEW GWETS (AOPC 14) either discharges to Stevens Creek or is treated via RO at the Building N271 IWPP (AOPC 20), and then is used for the ARC Jet Complex before discharge into the Palo Alto Sanitary Sewer.

One surface water sample was collected at AOPC 13. This is the same sample collected to evaluate AOPC 14 (see next section). PFBS was detected at estimated concentration of 1.3 ng/L, PFOA was detected at estimated concentration of 1.1 ng/L, PFHxS was detected at 5.4 ng/L, and PFOS was detected at 7.4 ng/L. HFPO-DA and PFNA were not detected in the sample. No screening levels for surface water have been established.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA, the Navy, and MEW PRPs are all possible contributors to PFAS releases at AOPC 13.

- Further Investigation: Further investigation of the extents of PFAS in surface water at AOPC 13 is recommended, along with routine quarterly monitoring of the influent and effluent and taking additional steps as needed based on results.

6.14 AOPC 14 – MIDDLEFIELD-ELLIS-WHISMAN GROUNDWATER EXTRACTION TREATMENT SYSTEM

Conclusions

One influent and one effluent sample were collected at AOPC 14. Influent and effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. PFOS, PFOA, and PFHxS concentrations in both samples exceeded the groundwater RSLs. Concentrations of PFOS and PFOA in both samples also exceeded the groundwater ESLs. Eleven of the 28 PFAS were detected in the samples from AOPC 14. In all cases except for PFBA and PFPeA, the influent concentration was higher than the effluent concentration, and those respective sets of concentrations of the two analytes differed negligibly (less than two ng/L). At ARC, treated water from MEW GWETS (AOPC 14) either discharges to Stevens Creek or is treated via RO at the Building N271 IWPP (AOPC 20), and then is used for the ARC Jet Complex before discharge into the Palo Alto Sanitary Sewer.

One surface water sample was collected at AOPC 14 (same sample as AOPC 13). PFBS was detected at estimated concentration of 1.3 ng/L, PFOA was detected at estimated concentration of 1.1 ng/L, PFHxS was detected at 5.4 ng/L, and PFOS was detected at 7.4 ng/L. HFPO-DA and PFNA were not detected in the sample. No screening levels for surface water have been established.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA, the Navy, and MEW PRPs are the possible contributors to PFAS releases at AOPC 14.

- Further Investigation: Further investigation of discharges from the MEW GWETS into Stevens Creek is recommended (no PFAS has been detected in effluent from NASA's GWETS). Routine quarterly monitoring of the influent and effluent is also recommended, and additional steps should be taken based on results. The MEW GWETS should be updated to reduce concentrations of PFAS to below appropriate discharge concentrations in Stevens Creek.

6.15 AOPC 15 – WEST-SIDE AQUIFERS TREATMENT SYSTEM (IR 28)

Conclusions

One influent and one effluent sample were collected at AOPC 15. Influent and effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. PFOS, PFOA, and PFHxS concentrations in the influent sample exceeded the groundwater RSLs. Concentrations of PFOS and PFOA in the influent sample also exceeded the groundwater ESLs. Twelve of the 28 PFAS were detected in the influent sample from AOPC 15. The only PFAS detected in the effluent sample was PFBA at an estimated concentration of 3.9 ng/L.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA, the Navy, and MEW PRPs are all possible contributors to PFAS releases at AOPC 15.
- Further Investigation: Routine quarterly monitoring of the influent and effluent is recommended, and additional steps should be taken as needed based on results.

6.16 AOPC 16 – NORTH PATROL ROAD DITCH (IR 21) AND NORTHERN CHANNEL (IR 27)

Conclusions

Five groundwater samples were collected at AOPC 16. All of the 28 PFAS were detected in groundwater samples from AOPC 16. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in three samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in two samples. PFBS and PFNA were not detected at any concentrations exceeding any screening levels. HFPO-DA was non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA, the Navy, and CANG are all possible contributors to PFAS releases at AOPC 16.

- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended. The pathway of PFAS in surface water between AOPC 11 (Building 191 Pump Station), AOPC 16 (North Patrol Road Ditch and Northern Channel), and AOPC 17 (Marriage Road Ditch) should also be investigated.

6.17 AOPC 17 – MARRIAGE ROAD DITCH (IR 3)

Conclusions

Groundwater samples were collected at five locations within AOPC 17. Thirteen of the 28 PFAS were detected in groundwater samples from AOPC 17. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in four samples. PFHxS was detected at concentrations exceeding the groundwater RSL in four samples. PFNA and PFBS were not detected at concentrations exceeding any screening levels. HFPO-DA was non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA, the Navy, and CANG are all possible contributors to PFAS releases at AOPC 17.

- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended. The pathway of PFAS in surface water between AOPC 11 (Building 191 Pump Station), AOPC 16 (North Patrol Road Ditch and Northern Channel), and AOPC 17 (Marriage Road Ditch) should also be investigated.

6.18 AOPC 18 – LINDBERGH AVENUE STORM DRAIN DITCH (AOI 6)

Conclusions

Groundwater samples were collected at three locations within AOPC 18. Twelve of the 28 PFAS were detected in groundwater samples from AOPC 18. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in two samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the

groundwater ESL of 6.5 ng/L in all three samples. PFHxS was detected at concentrations exceeding the groundwater RSL in two samples. PFBS and PFNA did not exceed any screening levels. HFPO-DA was non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that the Navy and NASA are both possible contributors to PFAS releases at AOPC 18.
- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

6.19 AOPC 19 – STORMWATER RETENTION PONDS (WITHIN IR 25)

Conclusions

One surface water sample was collected at AOPC 19; however, the data were flagged with the X and UX qualifiers (see Appendix H). The "X" qualifier in the DoD program indicates that the data point should be excluded, so results from this sample were excluded from data evaluation.

Recommendations

- PRP Analysis: Preliminary information indicates that the Navy and NASA would be possible contributors to PFAS releases at AOPC 19.
- Further Investigation: Re-sampling of surface water is recommended for AOPC 19, along with sediment sampling.

6.20 AOPC 20 – BUILDING N271 INDUSTRIAL WASTEWATER PRETREATMENT PLANT

Conclusions

One effluent sample was collected at AOPC 20. Effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. PFOS, PFOA, and PFHxS concentrations in the sample exceeded the groundwater RSLs. Concentrations of PFOS and PFOA exceeded groundwater ESLs. There were no PFBS screening level exceedances, and

PFNA and HFPO-DA were both non-detect. Eleven of the 28 PFAS were detected in the sample from AOPC 20. At ARC, water from NASA GWETS (AOPC 13) and MEW GWETS (AOPC 14) is treated via RO at the Building N271 IWPP (AOPC 20), and then is used for the ARC Jet Complex before discharge into the Palo Alto Sanitary Sewer.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA and the MEW PRPs would be both possible contributors to PFAS releases at AOPC 20.

- Further Investigation: Routine quarterly monitoring of the treated water effluent is recommended, and additional steps should be taken as needed based on results.

6.21 AOPC 21 – FORMER INDUSTRIAL WASTEWATER SURFACE IMPOUNDMENT (IR 4)

Conclusions

Groundwater samples were collected at eight locations within AOPC 21. Fourteen of the 28 PFAS were detected in groundwater samples from AOPC 21. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in seven samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples. In one additional sample, only the PFOS groundwater RSL of 4 ng/L was exceeded. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in five samples. PFNA, PFBS, and HFPO-DA were not detected at concentrations exceeding any screening levels.

Recommendations

- PRP Analysis: Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 21.

- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

6.22 AOPC 22 – BUILDING N249 OUTDOOR AERODYNAMIC RESEARCH FACILITY

Conclusions

Groundwater samples were collected at two locations within AOPC 22. Seven of the 28 PFAS were detected in groundwater samples from AOPC 22. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in three samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in one sample. PFOA, PFNA, PFBS, and HFPO-DA were not detected at concentrations exceeding any screening levels.

Recommendations

- PRP Analysis: Preliminary information indicates that NASA is the possible contributor to PFAS releases at AOPC 22.
- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

6.23 AOPC 23 – HANGAR 4 (CANG) BUILDING 662

Conclusions

Previous sampling efforts already identified the presence of PFAS at AOPC 23 prior to this SI. However, during the SI, one groundwater sample was collected from a new well, PFAS-C, which is near a well previously sampled for AOPC 23. Results from PFAS-C are discussed in Section 5.23 and results from previous sampling in 2018-2019 at AOPC 23 are discussed in Section 3.6.23. Previous soil and groundwater sampling results are shown Figures 5-3 and Figure 5-16, respectively.

Recommendations

- PRP Analysis: Preliminary information indicates that CANG is the possible contributor to PFAS releases at AOPC 23.
- Further Investigation: A remedial investigation is recommended for AOPC 23.

6.24 AOPC 24 – MIDDLEFIELD-ELLIS-WHISMAN (MEW) PLUME

Conclusions

Groundwater samples were collected at four locations within AOPC 24. Eleven of the 28 PFAS were detected in groundwater samples from AOPC 24. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in one sample. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L in three samples. PFOS concentrations exceeded the groundwater ESL of 6.5 ng/L in two samples. PFHxS was detected at concentration exceeding the groundwater RSL of 39 ng/L in one sample. PFBS was not detected at concentrations exceeding any screening levels. PFNA and HFPO-DA were non-detect in all samples.

Recommendations

- PRP Analysis: Preliminary information indicates that the MEW PRPs are possible contributors to PFAS releases at AOPC 24.
- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

6.25 AOPC 25 – ORION PARK PLUME

Conclusions

Groundwater samples were collected at two locations within AOPC 25. Ten of the 28 PFAS were detected in groundwater samples from AOPC 25. PFOS was detected at concentrations exceeding the groundwater ESL of 6.5 ng/L in one sample and exceeding the groundwater RSL of 4 ng/L in two samples. PFOA, PFNA, PFHxS, HFPO-DA, and PFBS were not detected at concentrations exceeding any screening levels.

Recommendations

- PRP Analysis: To date, the source for the Orion Park Plume has not been identified.

- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

6.26 AOPC 26 – EASTERN BOUNDARY (IR 5)

Conclusions

A groundwater sample was collected along the ARC eastern property boundary at one location beside Lockheed Martin at well W5-3 and within former Site 5. Fifteen of the 28 PFAS were detected in the groundwater sample at this location. PFOA was detected at concentration exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L. PFOS was detected at concentration exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L. PFNA and PFHxS concentrations exceeded the groundwater RSLs of 5.9 and 39 ng/L, respectively. The detected concentration of PFBS did not exceed any screening levels, and HFPO-DA was not detected in the sample.

Recommendations

- PRP Analysis: Preliminary information indicates that the Navy and Lockheed Martin are both possible contributors to PFAS releases at AOPC 26.

- Further Investigation: Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended.

6.27 PATH FORWARD

All 26 AOPCs included in this SI are recommended for further PFAS evaluation based on data exceeding screening levels or the need to collect additional data to evaluate potential PFAS impacts (e.g., AOPC 19 - Stormwater Retention Pond [within IR 25]). The highest detections for PFAS compounds with USEPA RSLs that have been identified in groundwater and soil, respectively, at ARC to date include: PFOS (40,000 ng/L, 1,900 µg/kg), PFOA (5,540 ng/L, 120 µg/kg), PFBS (1,500 ng/L, 1.8 µg/kg), HPFO-DA (estimated 6.10 ng/L, not detected in soil), PFHxS (10,400 ng/L, 92.0 µg/kg), and PFNA (111 ng/L, 2.60 µg/kg). Recommendations for each medium and AOPC are summarized in Table 6-1.

Currently the SI data indicate that PFAS are present in the surface water migrating off site. Further investigation is necessary to determine if there are unacceptable impacts from the presence of PFAS in off-site surface water based on determination of potential receptors and development of risk-based criteria using site specific parameters.

Table 6-1. Conclusions and Recommendations

AOPC	Screening Level Exceedances				Recommendations	PRP Analysis
	Soil	Groundwater	Surface Water	Influent/Effluent		
AOPC 1 - FORMER FIREFIGHTING TRAINING AREA (IR 10, 12, 20)	PFOS was detected at concentrations exceeding the soil RSL of 13 µg/kg in five samples and above the human health and ecologic ESLs of 12 µg/kg and 13 µg/kg, respectively, in five samples. PFOA was detected at concentrations exceeding the human health ESL of 3.8 µg/kg in five samples. PFOA concentrations exceeded the ecologic ESL of 84 µg/kg in one sample. PFOA exceeded the soil RSL of 19 µg/kg in three samples. There were no exceedances of the RSL for PFNA, PFHxS, HFPO-DA, or PFBS.	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and exceeding the groundwater ESL of 5.1 ng/L in eight samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and exceeding the groundwater ESL of 6.5 ng/L in nine samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in eight samples. PFNA was detected at a concentration exceeding the groundwater RSL of 5.9 ng/L in two samples. PFBS was detected at concentration exceeding the groundwater RSL of 600 ng/L in one sample. HFPO-DA was non-detect in all samples.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater and soil.	Preliminary information indicates that NASA, the Navy, and CANG are all possible contributors to PFAS releases at AOPC 1
AOPC 2 - CRASH SITE (SUNNYVALE GOLF COURSE)	PFOS was detected at concentrations exceeding the RSL, human health and ecologic ESLs in four samples. PFOA was detected at concentrations exceeding the human health ESL of 3.8 µg/kg in four samples. PFBS, PFHxS, and PFNA were not detected above screening criteria. HFPO-DA was non-detect in all samples.	PFOS was detected at concentrations exceeding the groundwater ESL of 6.5 ng/L and the groundwater RSL of 4 ng/L in three samples. PFOA, PFBS, PFNA, and PFHxS did not exceed any screening values. HFPO-DA was non-detect in all samples.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater and soil.	Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 2.
AOPC 3 - HANGARS 2 AND 3 (IR 7)	--	PFOA was detected at a concentration exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in six samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL in seven samples. PFNA was detected at a concentration exceeding the groundwater RSL of 5.9 ng/L in one sample. HFPO-DA was detected at a concentration exceeding the groundwater RSL of 6 ng/L in one sample. PFHxS was detected at concentration exceeding the groundwater RSL of 39 ng/L in five samples. PFBS was not detected above any screening levels.	--	--	Further investigate horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that the Navy and CANG are possible contributors to PFAS releases at AOPC 3.
AOPC 4 - FORMER ENGINE TEST STAND AREA (IR 11)	--	PFOA was detected at a concentration exceeding the groundwater RSL of 6 ng/L and groundwater ESL of 5.1 ng/L in both samples. There were no screening level exceedances for PFBS, PFHxS or PFOS, and neither PFNA nor HFPO-DA were detected in any samples.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 4.
AOPC 5 – HANGAR N211 (WITHIN AOI 3 AND FORMERLY AOI 12)	--	PFBS was detected in one sample at concentrations exceeding the groundwater RSL of 600 ng/L. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in seven samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in seven samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in five samples. PFNA was detected at concentrations exceeding the groundwater RSL of 5.9 ng/L in five samples. HFPO-DA was not detected in any samples.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that NASA is the possible contributor to PFAS releases at AOPC 5.
AOPC 6 – HANGAR N248 (AOI 3 EAST)	PFOS was detected at concentrations exceeding the RSL of 13 µg/kg and the human health and ecologic ESLs of 12 µg/kg and 13 µg/kg in both samples. PFOA was detected at concentrations exceeding the human health ESL of 3.8 µg/kg in one sample. There were no detections exceeding PFBS, PFNA, or PFHxS screening level exceedances. HFPO-DA was non-detect in all samples.	PFBS was detected at concentrations exceeding the groundwater RSL of 600 ng/L in one sample. PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in all three samples. PFOS was also detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in all three samples. PFHxS exceeded the groundwater RSL of 39 ng/L in three samples and PFNA exceeded the groundwater RSL of 5.9 ng/L in one sample. HFPO-DA was non-detect in all samples.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater and soil.	Preliminary information indicates that NASA is the possible contributor to PFAS releases at AOPC 6.
AOPC 7 – FIRE DEPARTMENT (BUILDING 580)	PFOS was detected at concentrations exceeding the soil RSL of 13 µg/kg and the human health and ecologic ESLs of 12 µg/kg and 13 µg/kg, respectively, in all four samples. PFOA was detected at a concentration exceeding the human health ESL of 3.8 µg/kg in one sample. There were no PFHxS, PFNA, or PFBS screening level exceedances. HFPO-DA was not detected in any samples.	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples. PFHxS exceeded the groundwater RSL of 39 ng/L in four samples and PFNA exceeded the groundwater RSL of 5.9 ng/L in one sample. PFBS did not exceed any screening levels. HFPO-DA was not detected in any samples.	--	--	Further investigate the horizontal and vertical extent of PFAS in groundwater and soil. For the purposes of further investigation, AOPC 7 will be subsumed into AOPC 1 as the PFAS compounds are the same or similar, and AOPC 7 is within AOPC 1.	Preliminary information indicates that NASA, the Navy, and CANG are all possible contributors to PFAS releases at AOPC 7.
AOPC 8 – SITE 1 RUNWAY LANDFILL (IR 1)	--	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in two samples. PFOS, PFBS, and PFHxS did not exceed any screening levels. PFNA and HFPO-DA were non-detect in all samples.		--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 8.

Table 6-1. Conclusions and Recommendations (continued)

AOPC	Screening Level Exceedances				Recommendations	PRP Analysis
	Soil	Groundwater	Surface Water	Influent/Effluent		
AOPC 9 – SITE 2 FORMER GOLF COURSE LANDFILL (IR 2)	--	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L in three samples. These three samples also exceeded the groundwater ESL of 5.1 ng/L. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L in three samples. These three samples also exceeded the groundwater ESL of 6.5 ng/L. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in three samples. PFBS and PFNA did not exceed any screening levels. HFPO-DA was non-detect in all samples.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 9.
AOPC 10 – SITE 22 LANDFILL (IR 22)	--	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in five samples. PFOS was detected at a concentration exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in one sample. PFBS and PFNA did not exceed any screening levels. HFPO-DA was non-detect in all samples.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 10.
AOPC 11 - BUILDING 191 PUMP STATION	--	--	PFNA was detected at a concentration of 13 ng/L, PFHxS was detected at a concentration of 930 ng/L, PFBS was detected at a concentration of 130 ng/L, PFOA was detected at a concentration of 340 ng/L, and PFOS was detected at a concentration of 1,400 ng/L. HFPO-DA was not detected in the sample. There are currently no screening levels for surface water.	--	Further investigation of the presence of PFAS in surface water is recommended, including the possibility of a pathway between AOPC 11 (Building 191 Pump Station), AOPC 16 (North Patrol Road Ditch and Northern Channel), and AOPC 17 (Marriage Road Ditch).	Preliminary information indicates that NASA, the Navy, and CANG are all possible contributors to PFAS releases at AOPC 11.
AOPC 12 - STORMWATER SETTLING BASIN/EASTERN DIKED MARSH (WITHIN IR 25)	--	--	PFBS was detected at a concentration of 4 ng/L, PFOA was detected at an estimated concentration of 1.1 ng/L, PFHxS was detected at 6 ng/L, and PFOS was detected at a concentration of 5.5 ng/L. HFPO-DA and PFNA were not detected in the sample. There are currently no screening levels for surface water.	--	Further investigate the sources and extent of PFAS in surface water.	Preliminary information indicates that NASA and the Navy are possible contributors to PFAS releases at AOPC 12.
AOPC 13 - NASA GROUNDWATER EXTRACTION TREATMENT SYSTEM	--	--	PFBS was detected at an estimated concentration of 1.3 ng/L, PFOA was detected at an estimated concentration of 1.1 ng/L, PFHxS was detected at 5.4 ng/L, and PFOS was detected at a concentration of 7.4 ng/L. HFPO-DA and PFNA were not detected in the sample. There are currently no screening levels for surface water.	Influent/effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. Concentrations in the influent sample exceeded the groundwater RSLs for PFOS, PFHxS, and PFOA, as well as the groundwater ESLs for PFOS and PFOA. Concentrations of PFOS in the effluent sample exceeded the groundwater RSL of 4 ng/L; however, the concentration in the duplicate sample was under the RSL.	Further investigation of the extent of PFAS in surface water at AOPC 13 is recommended, along with routine quarterly monitoring of the influent and effluent and taking additional steps as needed based on results.	Preliminary information indicates that NASA, the Navy, and MEW PRPs are all possible contributors to PFAS releases at AOPC 13.
AOPC 14 - MIDDLEFIELD-ELLIS-WHISMAN GROUNDWATER EXTRACTION TREATMENT SYSTEM	--	--	PFBS was detected at an estimated concentration of 1.3 ng/L, PFOA was detected at an estimated concentration of 1.1 ng/L, PFHxS was detected at 5.4 ng/L, and PFOS was detected at a concentration of 7.4 ng/L. HFPO-DA and PFNA were not detected in the sample. There are currently no screening levels for surface water.	Influent/effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. Concentrations in both samples exceeded the groundwater RSLs for PFOS, PFOA, and PFHxS, as well as the groundwater ESLs for PFOS and PFOA. In all cases except for PFBA and PFPeA, the influent concentration was higher than the effluent concentration, and for these two compounds the difference was negligible.	Further investigate discharges from the MEW GWETS into Stevens Creek is recommended. Routine quarterly monitoring of the influent and effluent is also recommended, and additional steps should be taken based on results. In addition, it is recommended that a treatment train modification is considered to eliminate discharge of PFAS from the treatment system. The MEW GWETS should be updated to reduce concentrations of PFAS to below appropriate discharge concentrations in Stevens Creek.	Preliminary information indicates that the NASA, the Navy, and MEW PRPs are the possible contributors to PFAS releases at AOPC 14.
AOPC 15 - WEST-SIDE AQUIFERS TREATMENT SYSTEM	--	--	--	Influent and effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. Concentrations in the influent sample exceeded the groundwater RSLs for PFOS, PFOA, and PFHxS, as well as the groundwater ESLs for PFOS and PFOA. Twelve of the 28 PFAS compounds were detected in the influent sample from AOPC 15. The only PFAS compound detected in the effluent sample was PFBA, at an estimated concentration of 3.9 ng/L.	Routine quarterly monitoring of the influent and effluent is recommended, and take additional steps should be taken as needed based on the results.	Preliminary information indicates that NASA, the Navy, and MEW PRPs are all possible contributors to PFAS releases at AOPC 15.
AOPC 16 - NORTH PATROL ROAD DITCH (IR 21) AND NORTHERN CHANNEL (IR 27)	--	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples. PFOS was also detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in three samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in two samples. PFBS and PFNA were not detected at any concentrations exceeding any screening levels. HFPO-DA was non-detect in all samples.	--	--	Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended. The pathway of PFAS in surface water between AOPC 11 (Building 191 Pump Station), AOPC 16 (North Patrol Road Ditch and Northern Channel), and AOPC 17 (Marriage Road Ditch) should also be investigated.	Preliminary information indicates that NASA, the Navy, and CANG are all possible contributors to PFAS releases at AOPC 16.

Table 6-1. Conclusions and Recommendations (continued)

AOPC	Screening Level Exceedances				Recommendations	PRP Analysis
	Soil	Groundwater	Surface Water	Influent/Effluent		
AOPC 17 - MARRIAGE ROAD DITCH (IR 3)	--	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in four samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in four samples. PFHxS was detected at concentrations exceeding the groundwater RSL in four samples. PFNA and PFBS were not detected at concentrations exceeding any screening levels. HFPO-DA was not detected.	--	--	Further investigation of the horizontal and vertical extents of PFAS in groundwater is recommended. The pathway of PFAS in surface water between AOPC 11 (Building 191 Pump Station), AOPC 16 (North Patrol Road Ditch and Northern Channel), and AOPC 17 (Marriage Road Ditch) should also be investigated.	Preliminary information indicates that NASA, the Navy, and CANG are all possible contributors to PFAS releases at AOPC 17.
AOPC 18 - LINDBERGH AVENUE STORM DRAIN DITCH (AOI 6)	--	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in two samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in all three samples. PFHxS was detected at concentrations exceeding the groundwater RSL in two samples. PFBS and PFNA did not exceed any screening levels. HFPO-DA was non-detect in all samples.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that the Navy and NASA are both possible contributors to PFAS releases at AOPC 18.
AOPC 19 - STORMWATER RETENTION PONDS (WITHIN IR 25)	--	--	One surface water sample was collected at AOPC 19. However, this sample was flagged with qualifiers during data validation that indicated the sample should be excluded from the dataset. This sample was therefore not included in the data evaluation.	--	Re-sampling of surface water is recommended for AOPC 19, along with sediment sampling.	Preliminary information indicates that the Navy and NASA would be possible contributors to PFAS releases at AOPC 19.
AOPC 20 - BUILDING N271 INDUSTRIAL WASTEWATER PRETREATMENT PLANT	--	--	--	Effluent results were compared to USEPA and State groundwater screening levels for evaluation purposes only. Concentrations in the sample exceeded the groundwater RSLs for PFOS, PFOA, and PFHxS, and the groundwater ESLs for PFOS and PFOA. There were no PFBS or PFNA screening level exceedances, and HFPO-DA was non-detect for all samples.	Routine quarterly monitoring of the effluent is recommended, and additional steps should be taken as needed based on results.	Preliminary information indicates that NASA and the MEW PRPs would be both possible contributors to PFAS releases at AOPC 20.
AOPC 21 - FORMER INDUSTRIAL WASTEWATER SURFACE IMPOUNDMENT (IR 4)	--	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in seven samples. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in five samples. In one additional sample, only the PFOS groundwater RSL of 4 ng/L was exceeded. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in five samples. PFNA, PFBS, and HFPO-DA were not detected at concentrations exceeding any screening levels.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that the Navy is the possible contributor to PFAS releases at AOPC 21.
AOPC 22 - BUILDING N249 OUTDOOR AERODYNAMIC RESEARCH FACILITY	--	PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L in three samples. PFHxS was detected at concentrations exceeding the groundwater RSL of 39 ng/L in one sample. PFOA, PFNA, PFBS, and HFPO-DA were not detected at concentrations exceeding any screening levels.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that NASA is the possible contributor to PFAS releases at AOPC 22.
AOPC 23 - HANGAR 4 (CANG) BUILDING 662	No samples were collected from this AOPC as a part of this SI, as the presence of PFAS already had been established during previous investigations. Results from these previous investigations are discussed in Section 3.6.23.	Previous sampling efforts already identified the presence of PFAS at AOPC 23 prior to this SI. However, during the SI, one groundwater sample was collected from a new well, PFAS-C, which is near a well previously sampled for AOPC 23. Results from PFAS-C are discussed in Section 5.23 and results from previous sampling in 2018-2019 at AOPC 23 are discussed in Section 3.6.23.	--	--	A remedial investigation is recommended for AOPC 23.	Preliminary information indicates that CANG is the possible contributor to PFAS releases at AOPC 23.
AOPC 24 - MIDDLEFIELD-ELLIS-WHISMAN (MEW) PLUME	--	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L in one sample. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L in three samples. PFOS also exceeded the groundwater ESL of 6.5 ng/L in two samples. PFHxS was detected at a concentration exceeding the groundwater RSL of 39 ng/L in one sample. PFBS was not detected at concentrations exceeding any screening levels. PFNA and HFPO-DA were non-detect in all samples.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that the MEW PRPs are possible contributors to PFAS releases at AOPC 24.
AOPC 25 - ORION PARK PLUME	--	PFOS was detected at concentrations exceeding the groundwater ESL of 6.5 ng/L in one sample and exceeding the groundwater RSL of 4 ng/L in two samples. PFOA, PFHxS, and PFBS were not detected at concentrations exceeding any screening levels. HFPO-DA and PFNA were non-detect in all samples.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	To date, the source for the Orion Park Plume has not been identified.

Table 6-1. Conclusions and Recommendations (continued)

AOPC	Screening Level Exceedances				Recommendations	PRP Analysis
	Soil	Groundwater	Surface Water	Influent/Effluent		
AOPC 26 - EASTERN BOUNDARY (IR 5)	--	PFOA was detected at concentrations exceeding the groundwater RSL of 6 ng/L and the groundwater ESL of 5.1 ng/L. PFOS was detected at concentrations exceeding the groundwater RSL of 4 ng/L and the groundwater ESL of 6.5 ng/L. PFNA and PFHxS exceeded the groundwater RSLs of 5.9 ng/L and 39 ng/L, respectively. The detected concentration for PFBS did not exceed any screening levels, and HFPO-DA was not detected in the sample.	--	--	Further investigate the horizontal and vertical extents of PFAS in groundwater.	Preliminary information indicates that the Navy and Lockheed Martin are both possible contributors to PFAS releases at AOPC 26.

Notes:
AOPC - Area of Potential Concern
RSL - Regional Screening Level (Federal/USEPA)
ESL - Environmental Screening Level (California Water Board)
-- Not applicable

SECTION 7

REFERENCES

AECOM. 2019. Final Site Inspection Report Air National Guard Phase II Regional Site Inspections for Per- and Polyfluoroalkyl Substances, Moffett Field Air National Guard Base, Mountain View, California. June.

ATSDR (Agency for Toxic Substances and Disease Registry). 2021. Toxicological Profile for Perfluoroalkyls. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. May.

Barzen-Hansen K.A., S.E. Davis, M. Kieber, and J.A. Field. 2017. "Sorption of Fluorotelomer Sulfonates, Fluorotelomer Sulfonamido Betaines, and a Fluorotelomer Sulfonamido Amine in National Aqueous Film Forming Foam to Soil," *Environmental Science and Technology 51*(21):12394-12400.

BB&E, Inc. 2016. Draft Final Perfluorinated Compound Preliminary Assessment, Moffett Field Air National Guard Station, Mountain View, California. April.

California Air National Guard (CANG). 2004. Final Environmental Baseline Survey for the Proposed Lease Disposal at Moffett Federal Airfield. 129th Rescue Wing. August.

CANG. 2020a. Email Message Regarding CANG Hangar. From Scott Frost, 129 Civil Engineer Production Control. To Ingrid Chen, Environmental Engineer, Tetra Tech. March 12.

CANG. 2020b. Email Message Regarding: Non-DoD Source CANG Hangar. From Michael Yeihey, Senior Master Sergeant. To Ingrid Chen, Environmental Engineer, Tetra Tech. March 16.

California Environmental Protection Agency, Office of Environmental Health Hazard Assessment. 2019. Notification Level Recommendations – Perfluorooctanoic Acid and Perfluorooctane Sulfonate in Drinking Water. August.

California State Water Resources Control Board (CSWRCB). 2019a. Water code Sections 13267 and 13383 Order for the Determination of the presence of Per- and Polyfluoroalkyl substances at Chrome Plating Facilities. Order WQ 2019-0045-DWQ. October.

California State Water Resources Control (CSWRCB). 2019b. Geo Tracker Case Summary, Lockheed Sunnyvale – Process Water Treatment and Reclamation Facility. December.

CSWRCB, Division of Drinking Water (DDW). 2020a. Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS). Accessed May 7. https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/PFOA_PFOS.html

CSWRCB. 2020b. Geo Tracker Case Summary, California Microwave, Sunnyvale, California. March 21.

CSWRCB. 2020c. Geo Tracker Case Summary, E/M Lubricants, Mountain View, California. March 21.

CSWRCB. 2020d. Geo Tracker Case Summary, Moffett Federal Airfield Site 1. January.

CSWRCB. 2020e. Geo Tracker Case Summary, Moffett Federal Airfield Site 25. January.

CSWRCB. 2021. Order WQ 2021-0006-DWQ, Water Code, Sections 13267 and13383, Order for the Determination of the Presence of Per- and Polyfluoroalkyl Substances at Bulk Fuel Storage Terminals and Refineries. March 21.

Cameron-Cole, L.L.C. 2019. Annual Groundwater Monitoring Report. Calendar Year 2018. Lockheed Martin Space Plant One Site, Sunnyvale, California. March.

Department of Defense (DOD) 2022. Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Programs. Office of the Assistant Secretary of Defense (OASD), Memorandum for Assistant Secretary of the Army (Installations Energy and Environment) Assistant Secretary of The Navy (Energy, Installations and Environment) Assistant Secretary of the Air Force (Installations, Environment and Energy) Director, National Guard Bureau (Joint Staff, J8) Director, Defense Logistics Agency (Installation Support). 6 July.

Earth Resources Technology, Inc. 2017. Final NASA Ames Land Use Controls Implementation and Monitoring Plan. NASA Ames Research Center. Moffett Field, California. September.

ERT. 2018. Annual Progress Report, NASA Ames Regional Groundwater Remediation Program. NASA Area of Responsibility and Site 28 WATS Area, NASA Ames Research Center, Moffett Field, California. June.

ERT. 2019a. Draft Site Management Plan, NASA Moffett Federal Facility Agreement Fiscal Year 2020, NASA Ames Research Center, Moffett Field, California. April.

ERT. 2019b. Draft Annual Groundwater Monitoring Report and Historical Data Summary for the Orion Park Plume, NASA Ames Research Center, Moffett Field, California. November.

Environmental Data Resources, Inc. (EDR). 2019. EDR Area/Corridor Report, NEPA Search Map Report, Offsite Receptor Report, Historical Topo Map Report, Data Map Well Search Report. Shelton, Connecticut. November.

Higgins C.P. and R.G. Luthy. 2006. “Sorption of Perfluorinated Surfactants on Sediments.” *Environmental Science and Technology 40* (23): 7251-7256.

Integrated Science Solutions, Inc./Science Applications International Corporation (ISSi/SAIC) Team. 2005. Post Closure Report Alodine Room N211. NASA Ames Research Center. Moffett Field, California. October.

IT Corporation. 1993a. Draft West Side Aquifer Field Investigation Technical Memorandum. Volumes 1 through 4.

IT Corporation. 1993b. Remedial Investigation Report Operable Unit 2, Sites 3-11,13,14,16-19 Soils NAS Moffett Field, California. May.

Interstate Technology Regulatory Council (ITRC). 2017. History and Use of Per- and Polyfluoroalkyl Substances (PFAS). November.

ITRC. 2018. Remediation Technologies and Methods for Per- and Polyfluoroalkyl Substances (PFAS) and Use of Per- and Polyfluoroalkyl Substances (PFAS). March.

Leidos. 2020. Email Message Regarding: Site 1 & 22. From Luke Metz. To Ingrid Chen, Tetra Tech. February 13.

National Aeronautics and Space Administration (NASA). 2002. Spill Occurrence Report. Environmental Management Office. October.

NASA. 2003. Spill Occurrence Report Environmental Management Office. September.

NASA. 2005a. Letter Regarding Navy Fire Training Area. From Donald Chuck. To Judy Huang, California Regional Water Quality Control Board. January 19.

NASA. 2005b. NASA Ames Procedural Requirements. Ames Center Directive Management System. April.

NASA. 2008. Environmental Baseline Survey for the Northern Channel. NASA Ames Research Center, Moffett Field, California. July.

NASA. 2012. Self-Guided Tour of Primary Facilities Historic Preservation Office. Fall.

NASA. 2013. Environmentally-driven Materials Obsolescence: Material Replacements and Lessons Learned from NASA's Space Shuttle Program. ITB, Inc./NASA Technology Evaluation for Environmental Risk Mitigation Principal Center (TEERM). October 24.

NASA. 2014. NASA Signs Lease with Planetary Ventures LLC for Use of Moffett Airfield and Restoration of Hangar One. New Release 14-305. November.

NASA. 2015. Storm Water Pollution Prevention Plan (SWPPP). NASA Ames Research Center, Moffett Field, California. June.

NASA. 2016. Sustainability Report, NASA Ames Research Center.

NASA. 2017. Storm Water Pollution Prevention Plan (SWPPP). NASA Ames Research Center, Moffett Field, California. June.

NASA. 2019a. PFAS Preliminary Assessment Work Plan for Various NASA Centers and Facilities. December.

NASA. 2019b. NASA-Related Uses of AFFF. Log.

NASA. 2019c. 2018 Annual Progress Report, NASA Ames Regional Groundwater Remediation Program. Moffett Field, CA. April.

NASA. 2020a. Email Message Regarding: Additional PFAS Question. From Keith Siuda. To Jaclyn Satira, NASA. March 6.,

NASA. 2020b. Email Message Regarding Foaming of the Runway. From Jaclyn Satira, NASA. To Ingrid Chen, Tetra Tech. March 6.

Naval Facilities Engineering Command (NAVFAC) Southwest BRAC PMO West. 2019. Draft Five-Year Review Report, Installation Restoration Program Site 26 and 28. Former Naval Air Station Moffett Field Mountain View, California. September.

New York Times. 1973. "Crew Error Seen in Air Collision." April 14. https://www.nytimes.com/1973/04/14/archives/crew-error-seen-in-air-collision-inquiry-opens-on-crash-of-nasa-jet.html

PRC Environmental Management, Inc. (PRC). 1996. Draft Site 5 Phase I Corrective Actions Technical Memorandum, Moffett Federal Airfield. August.

PRC Environmental Management, Inc. (PRC). 1997. Final East-side Aquifer Treatment System Long-Term Groundwater Monitoring Plan, Moffett Federal Airfield. July.

San Francisco Bay Regional Water Quality Control Board (Regional Water Board). 2000. Update Site Cleanup Requirement and Rescission of the Order 88-013 for Lockheed Martin Space Systems Company, Missiles & Space Operations Mathilda / Java, LLC Sunnyvale Mathilda Land, LLC. Order No. 00-124. November.

Regional Water Board. 2002. Closure Letter for IR Site 12, Aboveground Storage Tank, Moffett Federal Airfield, Moffett Field, California. August.

Regional Water Board. 2007. Staff Summary Report, Innerconn Technologies and Union Bank for the property located at 327 Moffett Boulevard, Mountain View, Santa Clara County – Rescission of Site Cleanup Requirements. April 11.

Regional Water Board. 2011. No Further Action for Site 5 North Fuel Farm Dry Wells, Former Naval Air Station Moffett Field, Mountain View, Santa Clara County. December.

Regional Water Board. 2012. No Further Action for Zook Road Fuel Spill Site, Former Naval Air Station Moffett Field, Santa Clara County. December.

Regional Water Board. 2020. Transmittal Memorandum, Transmittal of Interim Final Environmental Screening Levels (ESLs) for Two Per- and Polyfluoroalkyl Substances (PFAS): Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoate (PFOA). May 27.

RPS Group, Inc. 2019. Dewatering Discharge Plan, CANG Relocation Project, Moffett Federal Airfield, California. March.

San Francisco State University. 2020. Sunnyvale Plane Crash, KPIX Eyewitness News 1973. Bay Area Television Archive. San Francisco, California.

Santa Clara County Department of Environmental Health. 2008. Underground Storage Tank Unauthorized Release (Leak)/Contamination Site Report. July.

Schlumberger. 2019. Fourth Quarter and Annual 2018 Self-Monitoring Report MEW RGRP Treatment System, North of 101. February.

Shuttle Environmental Assurance (SEA). 2010. SEA Initiative Issue Working Paper, Perfluorooctanoic Acid: Risk Assessment & Mitigation Strategies. February.

Tetra Tech, Inc. (Tetra Tech). 1994. Baseline Environmental Report, Naval Air Station, Moffett Field, California. June.

Tetra Tech. 1997. East-Side Aquifer Treatment System Final Long-Term Groundwater Monitoring Plan, Moffett Federal Airfield, California. July.

Tetra Tech. 2017. Final Removal Action Work Plan, Area of Investigation 14, National Aeronautics and Space Administration, Ames Research Center, Moffett Field, California. December.

Tetra Tech. 2020. Interview Regarding Historical Soil and Groundwater Investigation and Remediation Activities at NASA Ames. Between Don Chuck, Division Chief, Environmental Management, NASA, and Ingrid Chen, Environmental Engineer. February 12.

Tetra Tech. 2021a. Per- and Polyfluoroalkyl Substances Preliminary Assessment Report for NASA Ames Research Center. January.

Tetra Tech. 2021b. Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan), Per- and Polyfluoroalkyl Substances Site Inspection for NASA Ames Research Center. June.

United States Department of Defense (DoD). 2022. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. July 6.

United States Department of the Navy (Navy). 1996. Memorandum of Agreement Between U.S. Department of the Navy - Engineering Field Activity West Naval Facilities Engineering Command and National Aeronautics and Space Administration Ames Research Center Regarding Institutional Controls at Operable Units One and Five. Moffett Field, California. June

Navy. 2017. NAVFAC, 2017 Annual Groundwater Report for IR Site 26, Former NAS Moffett Field, Moffett Field, CA. Figure 2-18. September 21.

Navy. 2021. NAVFAC, Final Interim Remedial Action Completion Report (IRACR) Installation Restoration (IR) Site 26, Former Naval Air Station Moffett Field, Moffett Field, CA. June.

United States Environmental Protection Agency (USEPA). 1989. Fairchild, Intel and Raytheon Sites Middlefield/Ellis/Whisman (MEW) Study Area, Mountain View, California, Record of Decision (ROD). May.

USEPA. 1990. Explanation of Significant Differences #1 to 1989 MEW ROD. September.

USEPA. 1994. Record of Decision, Final Operable Unit 2-EAST, Moffett Federal Airfield. San Francisco, California. October.

USEPA. 1996. Explanation of Significant Differences #2 to 1989 MEW ROD. April.

USEPA. 2003a. Discontinuing Groundwater Monitoring at Site 2, Former Moffett Federal Airfield, Moffett, California. January.

USEPA. 2003b. Human Health Toxicity Values in Superfund Risk Assessments. OSWER 9285.7-53. Office of Superfund Remediation and Technology Innovation, Washington, D.C. December 5.

USEPA. 2004. Final First Five-Year Review Report for Middle-Ellis-Whisman (MEW) Superfund Study Area, Mountain View and Moffett Field, California. September.

USEPA. 2012. EPA Approval of Former Moffett Field Site 27 Remedial Action Completion Report. San Francisco, California. April.

USEPA. 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA). Office of Water. EPA Document Number: 822-R-16-005. May.

USEPA. 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS). Office of Water. EPA Document Number: 822-R-16-004. May.

USEPA. 2019. Fourth Five-Year Review Report for Middlefield-Ellis-Whisman (MEW) Superfund Study Area, Mountain View and Moffett Field, Santa Clara, County, California. September.

USEPA. 2021a. Human Health Toxicity Values for Perfluorobutane Sulfonic Acid (CASRN 375-73-5) and Related Compound Potassium Perfluorobuane Sulfonate (CASRN 29420-49-3). EPA/600/R-20/345F. Office of Research and Development, Washington, D.C. April.

USEPA. 2021b. Human Health Toxicity Values for Hexafluoropropylene Oxide (HFPO) Dimer Acid and Its Ammonium Salt (CASRN 13252-13-6 and CASRN 62037- 80-3) Also

Known as "GenX Chemicals". EPA/822R-21-010. Office of Water, Washington, D.C. October.

USEPA, 2022a. Lifetime Drinking Water Health Advisories for Four Perfluoroalkyl Substances. Issued June 15, 2022. Federal Register Notice: 87:118 36848-36489.

USEPA. 2022b. Regional Screening Level Table. https://www.epa.gov/risk/regional-screening-levels-rsls-generic-table. May.

USEPA, 2022c. Regional Screening Levels for Chemical Contaminants at Superfund Sites, Regional Screening Levels (RSLs) – User's Guide. https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide

University of California, Berkeley. 2020. Silicor Materials Inc. (Formerly Known as Calisolar Inc.). Office of Intellectual Property & Industry Research Alliance. April 7. https://ipira.berkeley.edu/silicor-materials-inc-formerly-known-calisolar-inc.

Vista Analytical Laboratory (Vista). 2019a. Work Order No. 1900375. March.

Vista. 2019b. Work Order No. 1900422. March.

Zhu, Wenyu, H. Roakes, S.G. Zemba, and A.R. Badireddy. 2019. PFAS Background in Vermont Shallow Soils. February. https://anrweb.vt.gov/PubDocs/DEC/PFOA/Soil-Background/PFAS-Background-Vermont-Shallow-Soils-03-24-19.pdf

APPENDIX A
SITE INSPECTION WORK PLAN

Site Inspection Work Plan Modifications

See Section 4.7 of text for an explanation of the following five changes in the planned sample locations: Well PFAS-B was not installed; and Wells 3/114-MW1 (AOPC 3), W7-19 (AOPC 3), W3-3 (AOPC 17), W2-2A (AOPC 9), and LGMW-1 (AOPC 10) in the SIWP and SAP/QAPP were not found, and therefore were replaced with nearby wells UST3-MW-02, W7-3, W3-8, W2-12, and WGC2-1, respectively.

Appendix A - ARC Site Investigation Work Plan

Table A-1 - Proposed Sample Overview

Facility/ Center	Area of Potential Concern	Matrix	Well Id	Number of Samples	Sample Depth (ft bgs)[5]	Well Depth (ft bgs)[6]	Analyses[1]	Rationale	Screening Level[2]	Figure
Ames Research Center	AOPC 1 - Former Firefighting Training Area (IR 10, 12, 20)	Soil	NA	*8*	0 to 0.5 and 0.5 to 2	NA	EPA Method 537.1 and DoD QSM	Sample beside the paved areas here PFAs may have run off the pavement surface: at IR 20, one discrete sample location near the pavement, an beside the runways 3 discrete sample locations in unpaved areas between runways and connecting roadways.	Federal screening level[2]	Appendix F, Figures F-2 (soils) and F-3 (groundwater)
	1, 6, 7[4]	Groundwater	14C60A	1	1.49	No Record		Determine presence or absence of PFAS in groundwater at AOPC. Seven Existing wells at AOPC to check PFAS in groundwater. Two Existing Wells combined with AOPCs 6,7, and 23 sampling due to proximity		
	1, 7		11N21A1	1	-0.80	21.00				
	1, 7		PZA1-5C	1	5.49	27.50				
	1, 7		UST29-MW02	1	-0.37	16.50				
	1, 7		W20-01	1	2.47	No Record				
	1, 7		WU4-25	1	10.93	17.50				
	1, 7		WU4-9	1	5.86	47.20				
	AOPC 2- Crash Site (Sunnyvale Golf Course)	Soil	NA	*14*	0 to 0.5 and 0.5 to 2	NA	EPA Method 537.1 and DoD QSM	Sample seven locations on the 12th fairway around the crash site location.	Federal screening level[2]	Appendix F, Figures F-2 (soils) and F-4 (groundwater)
	2,26	Groundwater	New Well #C	1	5 bgs - 19.5bgs[8]	20[8]		Determine presence or absence of PFAS in groundwater at AOPC. Five New wells upgradient and downgradient of crash site to check PFAS in groundwater. Two New wells combined with AOPC 25 sampling due to proximity		
	2,26		New Well #D	1	5 bgs - 19.5bgs[8]	20[8]				
	2		New Well #E	1	5 bgs - 19.5bgs[8]	20[8]				
	2		New Well #F	1	5 bgs - 19.5bgs[8]	20[8]				
	2		New Well #G	1	5 bgs - 19.5bgs[8]	20[8]				
	AOPC 3 - Hangars 2 & 3 (IR 7)	Groundwater	NA				EPA Method 537.1 and DoD QSM	Determine presence or absence of PFAS in groundwater at AOPC. Seven Existing wells and one New well at and downgradient of AOPC to check PFAS in groundwater.	Federal screening level[2]	Appendix F, Figure F-5
	3		3/114-MW1	1	No Result[7,9]	No Record				
	3		W7-10	1	8bgs - 18 bgs	18.00				
	3		W7-11	1	9bgs - 15 bgs	15.00				
	3		W7-13	1	15 bgs - 25 bgs	25.00				
	3		W7-19	1	15 bgs - 25 bgs	20.00				
	3		W7-9	1	38.5 bgs - 43.5 bgs	43.50				
	3		W19-2	1	50.9 bgs - 55.9 bgs	55.90				
	3		New Well #B	1	5 bgs - 19.5bgs[8]	20[8]				
	AOPC 4 - Former Engine Test Stand Area (IR 11)	Groundwater	NA				EPA Method 537.1 and DoD QSM	Determine presence or absence of PFAS in groundwater at AOPC. One Existing well and one New well to determine potential impact to groundwater.	Federal screening level[2]	Appendix F, Figure F-6
	4		W11-2	1	17.5bgs-22.5 bgs	22.5				
	4,11		New Well #H	1	5 bgs - 19.5bgs[8]	20[8]				
	AOPC 5 - Hangar N211 (within AOI 3, formerly AOI 12)	Groundwater	NA	*0*	0 to 0.5 and 0.5 to 2	NA	EPA Method 537.1 and DoD QSM	Determine presence or absence of PFAS in groundwater at AOPC. Five Existing wells to check PFAS in groundwater combined with AOPC 23 sampling due to proximity.	Federal screening level[2]	Appendix F, Figure F-7
	5		14D12A	1	5.62	25.00				
	5		14D28A	1	4.70	No Record				
	5		14D36A	1	4.72	No Record				
	5		14D39A	1	3.66	No Record				
	5		REG-6A PIE	1	No Result[7,9]	No Record				
	5		WNB-14	1	6.22	29.00				
	5		WU4-19	1	3.29	41.50				
	AOPC 6 - Hangar N248 (AOI 3 East)	Soil	NA	*2*	0 to 0.5 and 0.5 to 2	NA	EPA Method 537.1 and DoD QSM	Sample in the unpaved areas at one location where PFAs may have run off the paved areas	Federal screening level[2]	Appendix F, Figures F-2 and F-8
	6	Groundwater	WU4-18	1	1.50	24.50		Determine presence or absence of PFAS in groundwater at AOPC. One Existing wells + One Existing wells combined with AOPC 23		
	6		14D02A	1	3.37	25.00				
	AOPC 7 - Fire Department (Building 580)	Soil	NA	*4*	0 to 0.5 and 0.5 to 2	NA	EPA Method 537.1 and DoD QSM	Sample 2 discrete sample locations beside the paved areas where PFAs may have run off the pavement surface .	Federal screening level[2]	Appendix F, Figures F-2 and F-3
		Groundwater						Determine presence or absence of PFAS in groundwater at AOPC. Seven Existing Wells combined with AOPCs 1, 6 and 23 sampling due to proximity		

Appendix A - ARC Site Investigation Work Plan

Table A-1 - Proposed Sample Overview

Facility/ Center	Area of Potential Concern	Matrix	Well Id	Number of Samples	Sample Depth (ft bgs)[5]	Well Depth (ft bgs)[6]	Analyses[1]	Rationale	Screening Level[2]	Figure
Ames Research Center	AOPC 8 - Site 1 Runway Landfill (IR 1)	Groundwater					EPA Method 537.1 and DoD QSM	Determine presence or absence of PFAS in groundwater at AOPC. Five Existing Wells	Federal screening level[2]	Appendix F, Figure F-9
	8		W1-14	1	4.1 bgs-14.1 bgs	14.50				
	8		W1-19	1	No Result[7,9]	No Record				
	8		W1-1R	1	14.3 bgs-24.3 bgs	24.70				
	8		W1-20	1	No Result[7,9]	No Record				
	8		W1-5	1	14.5 bgs-19.5 bgs	19.50				
	AOPC 9 - Former Golf Course Landfill (IR 2)	Groundwater					EPA Method 537.1 and DoD QSM	Determine presence or absence of PFAS in groundwater at AOPC. Two Existing Well + One Existing Well combined with AOPC 16 sampling due to proximity	Federal screening level[2]	Appendix F, Figure F-10
	9,16		W2-16	1	7.5 bgs-17.5 bgs	17.50				
	9		W2-2A	1	No Result[7,9,11]	No Record				
	9		W2-13	1	5.1 bgs-15.1 bgs	15.50				
	AOPC 10 - Site 22 Landfill (IR 22)	Groundwater					EPA Method 537.1 and DoD QSM	Determine presence or absence of PFAS in groundwater at AOPC. Six Existing wells + Three Existing Wells combined with AOPC 16 sampling due to proximity	Federal screening level[2]	Appendix F, Figure F-11
	10,16		WGC2-12	1	9.5 bgs-19.5 bgs	19.80				
	10		WGC2-13	1	10 bgs-20 bgs	20.50				
	10		WGC2-6	1	14 bgs-24 bgs	24.00				
	10		WGC2-10	1	9.2 bgs-19.2 bgs	19.50				
	10		WGC2-11	1	9.5 bgs-19.5 bgs	19.50				
	10		LGMW-1	1	No Result[7,9,11]	No Record				
	10,16		WGC2-4	1	10 bgs-20 bgs	20.00				
	10,16		WGC2-5	1	12 bgs-22 bgs	22.00				
	10		WGC2-8	1	12.8 bgs-22.8 bgs	23.00				
	AOPC 11 - Building 191 Pump Station	Surface Water, Effluent	NA	1	NA	NA	EPA Method 537.1 and DoD QSM	Determine presence or absence of PFAS in surface water discharge at AOPC.	Federal screening level[2]	Appendix F, Figure F-1
	AOPC 12 - Stormwater Settling Basin/Eastern Diked Marsh (within IR 25)	Surface Water	NA	1	NA	NA		Determine presence or absence of PFAS in surface water at stormwater settling basin effluent and overflow in Eastern Diked Marsh	Federal screening level[2]	Figure 4-9 & Appendix F, Figure F-1
	AOPC 13 - NASA Groundwater Extraction Treatment Plant	Influent and Effluent	NA	2	NA	NA		Determine presence or absence of PFAS in groundwater post granulated activated carbon treatment (GAC), at Building N271 before Reverse Osmosis (RO) for reuse and RO brine.	Federal screening level[2]	Appendix F, Figure F-1
	AOPC 14 - MEW Groundwater Extraction Treatment Plant	Influent and Effluent	NA	2	NA	NA		Determine presence of PFAS in treated groundwater for NPDES discharge	Federal screening level[2]	Appendix F, Figure F-1
	AOPC 15 - West-Side Aquifers Groundwater Extraction Treatment Plant	Influent and Effluent	NA	2	NA	NA		Determine presence of PFAS in treated groundwater for NPDES discharge	Federal screening level[2]	Appendix F, Figure F-1
	AOPC 16 - Northern Patrol Road Ditch (IR 21)/Northern Channel (IR 27)	Groundwater					EPA Method 537.1 and DoD QSM	Determine presence or absence of PFAS in groundwater at AOPC. One Existing well + Four Existing Wells combined with AOPC 9 and 10 sampling due to proximity	Federal screening level[2]	Appendix F, Figure F-12
	16		WU5-9	1	15 bgs-20 bgs	20.50				
	AOPC 17 - Marriage Road Ditch (IR 3)	Groundwater					EPA Method 537.1 and DoD QSM	Determine potential impact to groundwater. Three Existing wells + Two Existing Wells combined with AOPC 21 sampling due to proximity	Federal screening level[2]	Appendix F, Figure F-13
	17,21		EXW-4	1	No Result[7,9,11]	No Record				
	17,21		WU5-12	1	39.8 bgs-54.8 bgs	55.00				
	17		W3-1	1	10 bgs-20 bgs	19.70				
	17		W3-20	1	12 bgs-22 bgs	22.00				
	17		W3-3	1	8 bgs-18.1 bgs	18.10				
	AOPC 18 - Lindbergh Avenue Storm Drain Ditch (AOI 6)	Groundwater					EPA Method 537.1 and DoD QSM	Determine potential impact to groundwater. Two Existing wells + One Proposed New Well combined with AOPCs 22 and 23 sampling due to proximity	Federal screening level[2]	Appendix F, Figure F-14
	18,22		WNB-7	1	-2.01	20.00				
	18,22		11E02A	1	-2.60	17.50				
	18		New Well #A	1	5 bgs - 19.5bgs[8]	20[8]				
	AOPC 19 - Stormwater Retention Ponds (within IR 25)	Two Surface Water samples at culvert discharges	NA	2	NA	NA	EPA Method 537.1 and DoD QSM	Determine presence or absence of PFAS in surface water at AOPC. Samples will be taken once during the wet season.	Federal screening level[2]	Appendix F, Figure F-1
	AOPC 20 - Building N271 Industrial Wastewater Pretreatment Plant	Influent and Effluent for RO system	NA	2	NA	NA	EPA Method 537.1 and DoD QSM	Determine presence of PFAS pre-and post treatment before reuse	Federal screening level[2]	Appendix F, Figure F-1

Appendix A - ARC Site Investigation Work Plan

Table A-1 - Proposed Sample Overview

Facility/ Center	Area of Potential Concern	Matrix	Well Id	Number of Samples	Sample Depth (ft bgs)[5]	Well Depth (ft bgs)[6]	Analyses[1]	Rationale	Screening Level[2]	Figure
Ames Research Center	AOPC 21 - Former Industrial Wastewater Surface Impoundment (IR 4)	Groundwater					EPA Method 537.1 and DoD QSM	Determine potential impact to groundwater. Six Existing wells + Two Existing Wells combined with AOPCs 17 sampling due to proximity	Federal screening level[2]	Appendix F, Figure F-15
	21		W4-14	1	6 bgs-16 bgs	16.00				
	21		W4-6	1	35 bgs-50 bgs	50.00				
	21		X	1	28 bgs-40 bgs	40.00				
	21		X	1	10 bgs-20 bgs	20.00				
	21		WSW-5	1	15 bgs-20 bgs	20.40				
	21		WU5-10	1	33.8 bgs-38.8 bgs	39.00				
	AOPC 22 – Building N249 Outdoor Aerodynamic Research Facility	Groundwater					EPA Method 537.1 and DoD QSM	Determine presence or absence of PFAS in groundwater at AOPC. Two existing wells + Two Existing Wells combined with AOPC 18 sampling due to proximity	Federal screening level[2]	Appendix F, Figure F-16
	22		10J01A	1	2bgs-12bgs	17.50				
	22		10J02A	1	6bgs-16bgs	16				
	AOPC 23 - Hangar 4 (CANG) Building 662	Groundwater	NA	NA	NA	NA	NA	No further action in the SI, but it will move to Remedial Investigation.	Federal screening level[2]	Appendix F, Figures F-4-8
	AOPC 24 - Middlefield-Ellis-Whisman (MEW) Plume	Groundwater					EPA Method 537.1 and DoD QSM	Determine potential impact to onsite groundwater by offsite source. Four Existing wells +12 Existing Wells combined with AOPCs 1,5,6, and 7 sampling due to proximity	Federal screening level[2]	Appendix F, Figure F-17
	24		64A	1	No Result[7,9]	No Record				
	24		**171A**	1	***17 bgs - 27 bgs***	28.50				
	24		WU4-1	1	22.49	29.30				
	24		W89-1	1	22.86	29.80				
	AOPC 25 - Orion Park Plume[3]	Groundwater					EPA Method 537.1 and DoD QSM	Determine potential impact to onsite groundwater by offsite source. Two Existing wells + One Proposed New Well combined with AOPCs 18 and 22 sampling due to proximity	Federal screening level[2]	Appendix F, Figure F-18
	25		15B10A	1	8.57	No Record				
	25		15H12A	1	8.87	No Record				
	AOPC 26 - Lockheed Martin	Groundwater					EPA Method 537.1 and DoD QSM	Determine potential impact to onsite groundwater by offsite source. One Existing well and Two Proposed New Wells combined with AOPC 2 sampling due to proximity	Federal screening level[2]	Appendix F, Figure F-4, and F-19
	26		W5-3	1	20.2bgs-30.5 bgs	30.50				

Summary of Samples

Influent and Effluent =	8
Surface Water =	4
Groundwater Well Samples =	72
Soil Samples =	28
Replacement Wells	11
New Wells	8
Drums (for 19 wells) of IDW Drill Cuttings[10] =	41

Notes

1 Method should be compliant with Table B-15 of the Department of Defense Quality Systems Manual (QSM) version 5.3 or later. The PFAS analytes reported should be the combination of those listed in the EPA Method 537.1 and those listed for Department of Defense QSM. With the exception that N-methylperfluorooctanesulfonamide (CAS No. 31506-32-8) will not be analyzed.

2 Federal Screening Level: EPA RSL calculator can be used to calculate PFOA, PFOS, and PFBS human health screening values (i.e., PFAS with toxicity criteria) for surface water based on the recreational scenario.

3 Absence of AOPC-specific existing background monitoring wells

4 Monitoring Well is part of sampling event for AOPCs 6, 7 and 22

5 Sample depth is based on either water level measures from September 19, 2019 (NASA Ames 2020) , or the screen length recorded in the Monitoring Well Atlas (Naval Facilities Engineering Command 2012)

6 Well depth is based on measures recorded in the *Monitoring Well Atlas* (Naval Facilities Engineering Command 2012)

7 No Result: Well is identified as active in the A aquifer in the *Monitoring Well Atlas* . However, neither a recorded water level from prior sampling by NASA, nor a well screen interval is recorded

8 New proposed well would have a depth of 20 ft bgs with a screen interval anywhere from 4.5 to 19.5 ft bgs. Wells will be installed with either a direct-push or hollow-stem auger drill rig. Source of Water for drilling from San Francisco Hetch Hetchy Reservoir

9 A groundwater sample is required. If existing well is not usable, a new well will be installed to a depth of 20 ft bgs with a screen interval anywhere from 4.5 to 19.5 ft bgs

10 Drums for Drill cuttings = maximum 19 wells @ 6inch diameter, and 20 foot depth at@ 7.48 gallon/cf) = 41 drums

11 Well location confirmed during Tetra Tech's January 2020 site visit; however, well cap not removed

Appendix A - ARC Site Investigation Work Plan
Table A-1 - Proposed Sample Overview

Facility/ Center	Area of Potential Concern	Matrix	Well Id	Number of Samples	Sample Depth (ft bgs)[5]	Well Depth (ft bgs)[6]	Analyses[1]	Rationale	Screening Level[2]	Figure

Acronyms

AOI	Area of Investigation
AOPC	Area of Potential Concern
EPA	United States Environmental Protection Agency
ESLs	Environmental Screening Levels.
ft bgs	feet below ground surface
IR	Installation Restoration
MW	Monitoring Well
PFAS	Per- and polyfluoroalkyl substances
RO	Reverse Osmosis
NA	Not Applicable
NPDES	National Pollutant Discharge Elimination System
RWQCB	San Francisco Regional Water Quality Control Board.

References

NASA Ames 2020. *2019 Annual Progress Report, NASA Ames Regional Groundwater Remediation Program, NASA Area of Responsibility and Site 28 WATS Area*

Naval Facilities Engineering Command 2012. Monitoring Well Atlas, Former Naval Air Station Moffett Field, Base Realignment and Closure Program Management Office West. June

Appendix A - ARC Site Investigation Work Plan
Table A-2 - ARC Site Inspection Quality Assurance / Quality Control Detail

QA/QC Sample[1]	Matrix	Sample Name	Number of Samples	Analysis	Rationale
None	Soil	A-AOPCXX-SBXX-DUP MMDDYYYY	None	None	None, as duplicates for discrete soil samples area not reliably replicable
Field Duplicate (Dup) versus Samples (Ratio of 1:10)	Groundwater, Surface water, and influent/effluent	A-AOPCXX-WXX-DUP MMDDYYYY	9	PFAS[2]	Assess field and analytical precision.
Equipment Rinsate Blanks (ERB) (Ratio 1 sample per 20 samples)	Water	A-AOPCXX-ERBXX-MMDDYYYY	5	PFAS2	Assess decontamination procedures and potential for cross-contamination from reusable equipment.
Field Blank (FB) (Ratio of 1 per day of sampling for 19 days)	water	A-FBXX-MMDDYYYY	19 (estimated)		Assess potential ambient contaminations in the field or potential cross-contamination as a result of sample handling.
Matrix Spike and Matrix Spike Duplicate (MS/MSD) (Ratio 1 MS/MSD per sample group, typically a group is a sample shipment per laboratory per day. Assuming one laboratory, then 1 MS/MSD per day.)	Soil	A-MS/MSDXX-MMDDYYYY	3 (estimated)	PFAS[2]	Assess accuracy and bias caused by sample matrix.
	Groundwater	A- MS/MSDXX-MMDDYYYY	19 (estimated)	PFAS[2]	
Source Water Blanks (SWB) (Ratio - 1 sample per event)	Water	A- AOPCXX-SWBXX-MMDDYYYY	1	PFAS[2]	Assess potential for cross-contamination from water used for decontamination.

Notes:

1. PFAS-free water for equipment blanks, field blanks, and drilling and sampling equipment decontamination will be provided by the laboratory or an on-site source. If provided by an on-site source, the source will be sampled for PFAS by LC/MS/MS compliant with QSM Table B-15 of QSM 5.3 or later prior to use to confirm lack of detectable PFAS compounds. The PFAS analytes reported should be the combination of those listed in the EPA Method 537.1 and those listed for Department of Defense QSM. With the exception that N-methylperfluorooctanesulfonamide (CAS No. 31506-32-8) will not be analyzed.

2 - Method should be compliant with Table B-15 of the Department of Defense Quality Systems Manual (QSM) version 5.3 or later. The PFAS analytes reported should be the combination of those listed in the EPA Method 537.1 and those listed for Department of Defense QSM. With the exception that N-methylperfluorooctanesulfonamide (CAS No. 31506-32-8) will not be analyzed.

Abbreviations:

A- Sample from NASA Ames Research Center

A-AOPC - NASA Ames Research Center (A) Area of potential concern (AOPC).

DUP - Duplicate.

ERB -Equipment Rinsate Blanks

FB - Field Blank

LC/MS/MS - liquid chromatography tandem mass spectrometry.

MS/MSD - Matrix Spike and Matrix Spike Duplicate

MMDDYYYY - Data of sample representing month, day, year.

SB - Soil Boring

SWB - Source Water Blank

PFAS - per- and polyfluoroalkyl substances.

QA/QC - quality assurance/quality control.

TBD - to be determined in the field.

W - Groundwater, Surface water, or influent/effluent

XX - Sample number to be designated beginning with 01.

Appendix A- ARC Site Investigation Work Plan
Table A-3 - Proposed Groundwater Sampling

AOPC Number	AOPC Name	Well Status	Well ID	Aquifer	Latitude	Longitude
1, 7	Former Firefighting Training Area (IR 10, 12, 20)/ Fire Department (Building 580)	Existing Well	11N21A1	A1	37.41906357	-122.056015
1, 7	Former Firefighting Training Area (IR 10, 12, 20)/ Fire Department (Building 580)	Existing Well	W20-01	A1	37.41666794	-122.0538254
1, 7	Former Firefighting Training Area (IR 10, 12, 20)/ Fire Department (Building 580)	Existing Well	WU4-25	A1	37.41266251	-122.0524673
1, 7	Former Firefighting Training Area (IR 10, 12, 20)/ Fire Department (Building 580)	Existing Well	WU4-9	A2	37.41481018	-122.0543594
1, 7	Former Firefighting Training Area (IR 10, 12, 20)/ Fire Department (Building 580)	Existing Well	UST29-MW02	A1	37.41608047	-122.0535202
1, 7	Former Firefighting Training Area (IR 10, 12, 20)/ Fire Department (Building 580)	Existing Well	PZA1-5C	A1	37.41491318	-122.0539856
1, 6, 7	Former Firefighting Training Area (IR 10, 12, 20)/ Hangar N248 (AOI 3 East)/ Fire Department (Building 580)	Existing Well	14C60A	A1	37.41751099	-122.0550995
2, 26	Crash Site (Sunnyvale Golf Course)	Proposed New Well	C	A1	37.40539551	-122.0383835
2, 26	Crash Site (Sunnyvale Golf Course)	Proposed New Well	D	A1	37.40156555	-122.0372849
2	Crash Site (Sunnyvale Golf Course)	Proposed New Well	E	A1	37.40081406	-122.0409241
2	Crash Site (Sunnyvale Golf Course)	Proposed New Well	F	A1	37.39834595	-122.0417404
2	Crash Site (Sunnyvale Golf Course)	Proposed New Well	G	A1	37.40297318	-122.0434799
3	Hangars 2 & 3 (IR 7)	Existing Well	3/114-MW1	A1	37.41659164	-122.0432129
3	Hangars 2 & 3 (IR 7)	Existing Well	W19-2	A2	37.41807175	-122.0419922
3	Hangars 2 & 3 (IR 7)	Existing Well	W7-10	A1	37.41833496	-122.0421524
3	Hangars 2 & 3 (IR 7)	Existing Well	W7-11	A1	37.41694641	-122.0414276
3	Hangars 2 & 3 (IR 7)	Existing Well	W7-13	A1	37.41564941	-122.0407333
3	Hangars 2 & 3 (IR 7)	Existing Well	W7-9	A2	37.4184227	-122.0421982
3	Hangars 2 & 3 (IR 7)	Existing Well	W7-19	A1	37.41809464	-122.0437546
3	Hangars 2 & 3 (IR 7)	Proposed New Well	B	A1	37.41518021	-122.042511
4	AOPC 4 - Former Engine Test Stand Area (IR 11)	Existing Well	W11-2	A1	37.42749405	-122.0500107
4,11	AOPC 4 - Former Engine Test Stand Area (IR 11)	Proposed New Well	H	A1	37.42696942	-122.049884
5	Hangar N211 (within AOI 3, formerly AOI 12)	Existing Well	14D12A	A1	37.41508484	-122.057251
5	Hangar N211 (within AOI 3, formerly AOI 12)	Existing Well	14D28A	A1	37.4163475	-122.0571671
5	Hangar N211 (within AOI 3, formerly AOI 12)	Existing Well	14D36A	A1	37.41659927	-122.0570068
5	Hangar N211 (within AOI 3, formerly AOI 12)	Existing Well	14D39A	A1	37.41676331	-122.0573654
5	Hangar N211 (within AOI 3, formerly AOI 12)	Existing Well	WNB-14	A1	37.41599274	-122.0583038
5	Hangar N211 (within AOI 3, formerly AOI 12)	Existing Well	REG-6A PIE	Unknown	37.41509628	-122.0575638
5, 24	Hangar N211 (within AOI 3, formerly AOI 12)	Existing Well	WU4-19	A2	37.41690063	-122.0574036
6	Hangar N248 (AOI 3 East)	Existing Well	14D02A	A1	37.416996	-122.0564575
6	Hangar N248 (AOI 3 East)	Existing Well	WU4-18	A1	37.4176712	-122.0560455
8	Site 1 Runway Landfill (IR 1)	Existing Well	W1-14	A1	37.43012238	-122.0542145
8	Site 1 Runway Landfill (IR 1)	Existing Well	W1-19	A1	37.42979813	-122.0537109
8	Site 1 Runway Landfill (IR 1)	Existing Well	W1-1R	A1	37.42969131	-122.051384
8	Site 1 Runway Landfill (IR 1)	Existing Well	W1-20	A1	37.42996979	-122.0527802
8	Site 1 Runway Landfill (IR 1)	Existing Well	W1-5	A1	37.43279266	-122.0523987
9	Site 2 Former Golf Course Landfill (IR 2)	Existing Well	W2-13	A1	37.42567062	-122.0494003
9	Site 2 Former Golf Course Landfill (IR 2)	Existing Well	W2-2A	Unknown	37.42478561	-122.048233
9, 16	Site 2 Former Golf Course Landfill (IR 2)/ Patrol Road Ditch (IR 21)/ Northern Channel (IR 27)	Existing Well	W2-16	A1	37.42616272	-122.0482178
10	Site 22 Landfill (IR 22)	Existing Well	LGMW-1	A1	37.42522049	-122.0373688

Appendix A- ARC Site Investigation Work Plan
Table A-3 - Proposed Groundwater Sampling

AOPC Number	AOPC Name	Well Status	Well ID	Aquifer	Latitude	Longitude
10	Site 22 Landfill (IR 22)	Existing Well	WGC2-10	A1	37.42580032	-122.0394363
10	Site 22 Landfill (IR 22)	Existing Well	WGC2-11	A1	37.42521667	-122.0391235
10,16	Site 22 Landfill (IR 22)	Existing Well	WGC2-12	A1	37.42637253	-122.0351944
10	Site 22 Landfill (IR 22)	Existing Well	WGC2-13	A1	37.42528915	-122.0359497
10	Site 22 Landfill (IR 22)	Existing Well	WGC2-6	A1	37.42577744	-122.0351486
10	Site 22 Landfill (IR 22)	Existing Well	WGC2-8	A1	37.42657471	-122.0394592
10, 16	Site 22 Landfill (IR 22)/ Patrol Road Ditch (IR 21)/Northern Channel (IR 27)	Existing Well	WGC2-4	A1	37.4265976	-122.0366211
10, 16	Site 22 Landfill (IR 22)/ Patrol Road Ditch (IR 21)/Northern Channel (IR 27)	Existing Well	WGC2-5	A1	37.42671204	-122.0380325
16	Patrol Road Ditch (IR 21)/Northern Channel (IR 27)	Existing Well	WU5-9	A1	37.42675018	-122.0452347
17,21	Marriage Road Ditch (IR 3)	Existing Well	EXW-4	A1	37.42060089	-122.0432816
17	Marriage Road Ditch (IR 3)	Existing Well	W3-1	A1	37.42245483	-122.0424728
17	Marriage Road Ditch (IR 3)	Existing Well	W3-20	A1	37.42326355	-122.0425568
17	Marriage Road Ditch (IR 3)	Existing Well	W3-3	A1	37.42613983	-122.0411453
17,21	Marriage Road Ditch (IR 3)	Existing Well	WU5-12	A2	37.42057419	-122.0432205
18,22	Lindbergh Avenue Storm Drain Ditch (AOI 6)	Existing Well	11E02A	A1	37.42630005	-122.0577469
18,22	Lindbergh Avenue Storm Drain Ditch (AOI 6)	Existing Well	WNB-7	A1	37.4241066	-122.0580521
18	Lindbergh Avenue Storm Drain Ditch (AOI 6)	Proposed New Well	A	A1	37.42054367	-122.0598602
21	Former Industrial Wastewater Surface Impoundment (IR 4)	Existing Well	W4-14	A1	37.41986847	-122.0428391
21	Former Industrial Wastewater Surface Impoundment (IR 4)	Existing Well	W4-6	A2	37.42039871	-122.0426636
21	Former Industrial Wastewater Surface Impoundment (IR 4)	Existing Well	W6-5	A1	37.41972351	-122.042038
21	Former Industrial Wastewater Surface Impoundment (IR 4)	Existing Well	W6-6	A1	37.41960526	-122.0424576
21	Former Industrial Wastewater Surface Impoundment (IR 4)	Existing Well	WSW-5	A1	37.42032623	-122.0423355
21	Former Industrial Wastewater Surface Impoundment (IR 4)	Existing Well	WU5-10	A1	37.41985703	-122.042099
22	Building N249 Outdoor Aerodynamic Research Facility	Existing Well	10J01A	A1	37.42389679	-122.0610809
22	Building N249 Outdoor Aerodynamic Research Facility	Existing Well	10J02A	A1	37.42428589	-122.060791
24	Middlefield-Ellis-Whisman (MEW) Plume	Existing Well	64A	A1	37.40507889	-122.053093
24	Middlefield-Ellis-Whisman (MEW) Plume	Existing Well	171A	A1	37.41005707	-122.0592957
24	Middlefield-Ellis-Whisman (MEW) Plume	Existing Well	W89-1	A1	37.40633392	-122.0567627
24	Middlefield-Ellis-Whisman (MEW) Plume	Existing Well	WU4-1	A1	37.40550232	-122.0545883
25	Orion Park Plume	Existing Well	15B10A	A1	37.41516113	-122.0644379
25	Orion Park Plume	Existing Well	15H12A	A1	37.41557312	-122.0648804
26	Lockheed Martin	Existing Well	W5-3	A1	37.41872787	-122.0374908
	Total Wells =	**72**				

Notes:

AOI	Area of Investigation
AOPC	Area of Potential Concern
CANG	California Air National Guard
IR	Installation Restoration

Appendix A- ARC Site Investigation Work Plan
Table A-4 - Proposed Surface Water, Influent, and Effluent Sample

AOPC Number	AOPC Name S	Sample Type	Latitude[a]	Longitude[a]
11	Building 191 Pump Station	Surface water, Effluent	37.4260597229	-122.0492858887
12	Stormwater Settling Basin/ Eastern Diked Marsh (within IR 25)	Surface Water	37.4248924255	-122.0602722168
13	NASA Groundwater Extraction Treatment Plant	Influent/Effluent	37.4200782776	-122.0582199097
13	NASA Groundwater Extraction Treatment Plant	Influent/Effluent	37.4200782776	-122.0582199097
14	MEW Groundwater Extraction Treatment Plant	Influent/Effluent	37.41062389	-122.0557078
14	MEW Groundwater Extraction Treatment Plant	Influent/Effluent	37.41062389	-122.0557078
15	West-Side Aquifer Groundwater Extraction Treatment Plant	Influent/Effluent	37.4135665894	-122.0552291870
15	West-Side Aquifer Groundwater Extraction Treatment Plant	Influent/Effluent	37.4135665894	-122.0552291870
19	Stormwater Retention Ponds (within IR 25)	Surface Water	37.4276161194	-122.0577697754
19	Stormwater Retention Ponds (within IR 25)	Surface Water	37.4279403687	-122.0591049194
20	Building N271 Industrial Wastewater Pretreatment Plant	Influent/Effluent	37.4192466736	-122.0609893799
20	Building N271 Industrial Wastewater Pretreatment Plant	Influent/Effluent	37.4192466736	-122.0609893799

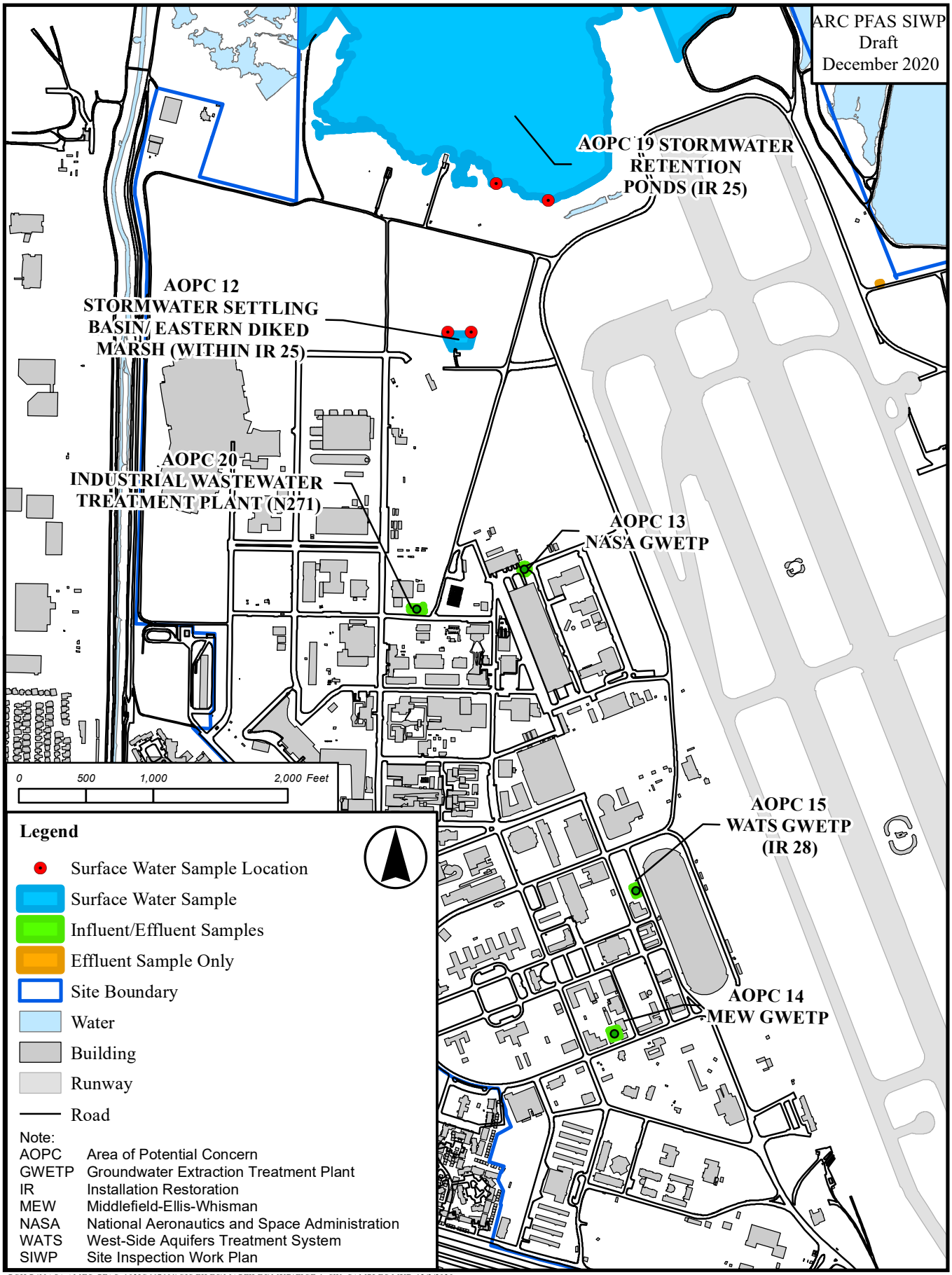
Notes:

[a] Approximate location subject to change based on field conditions

IR Installation Restoration

NASA National Aeronautics and Space Administration

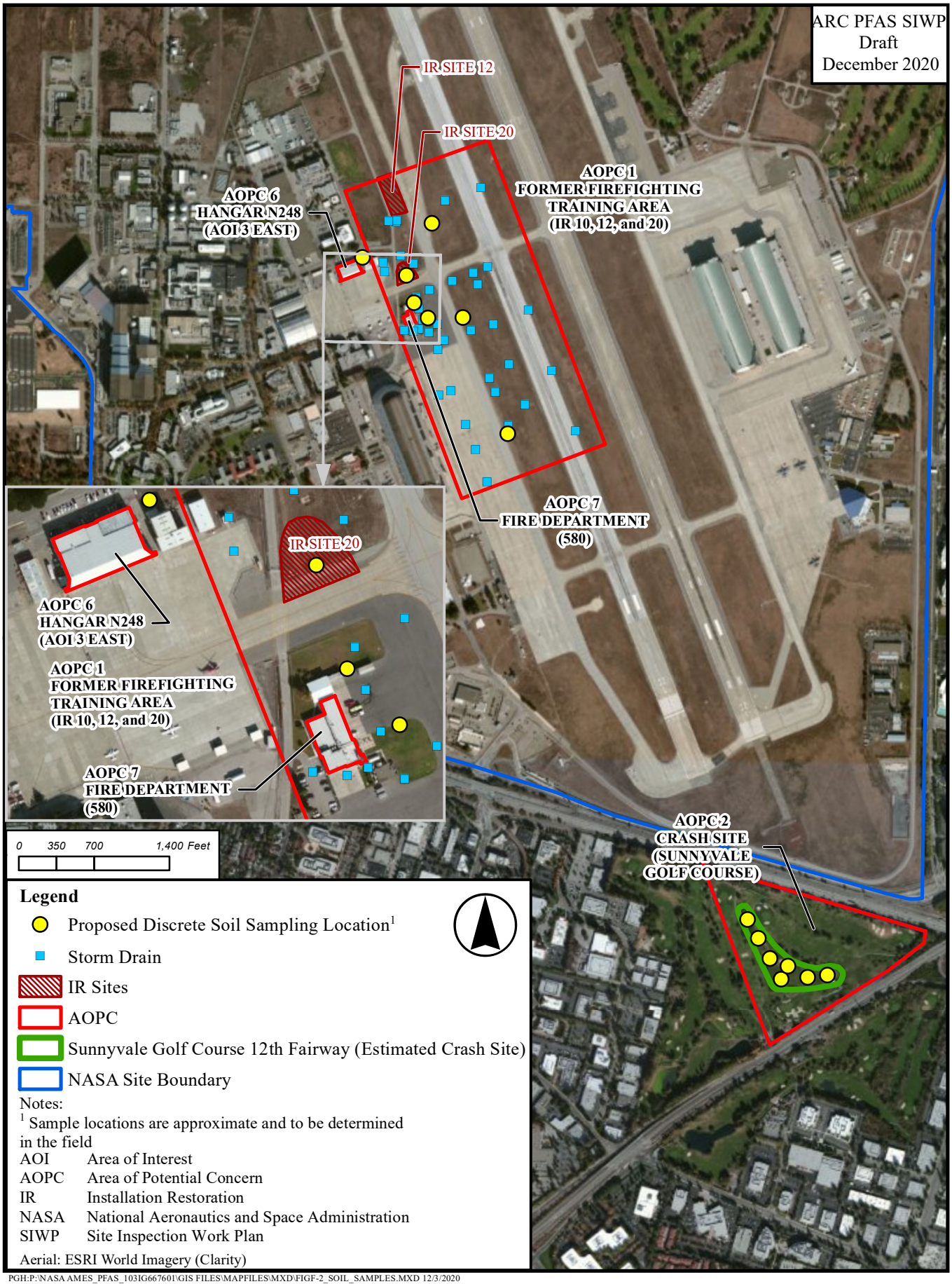
FIGURE A-1 SURFACE WATER AND INFLUENT/EFFLUENT SAMPLES
FAS PRELIMINARY ASSESSMENT FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-1_SW_SAMPLES.MXD 12/3/2020

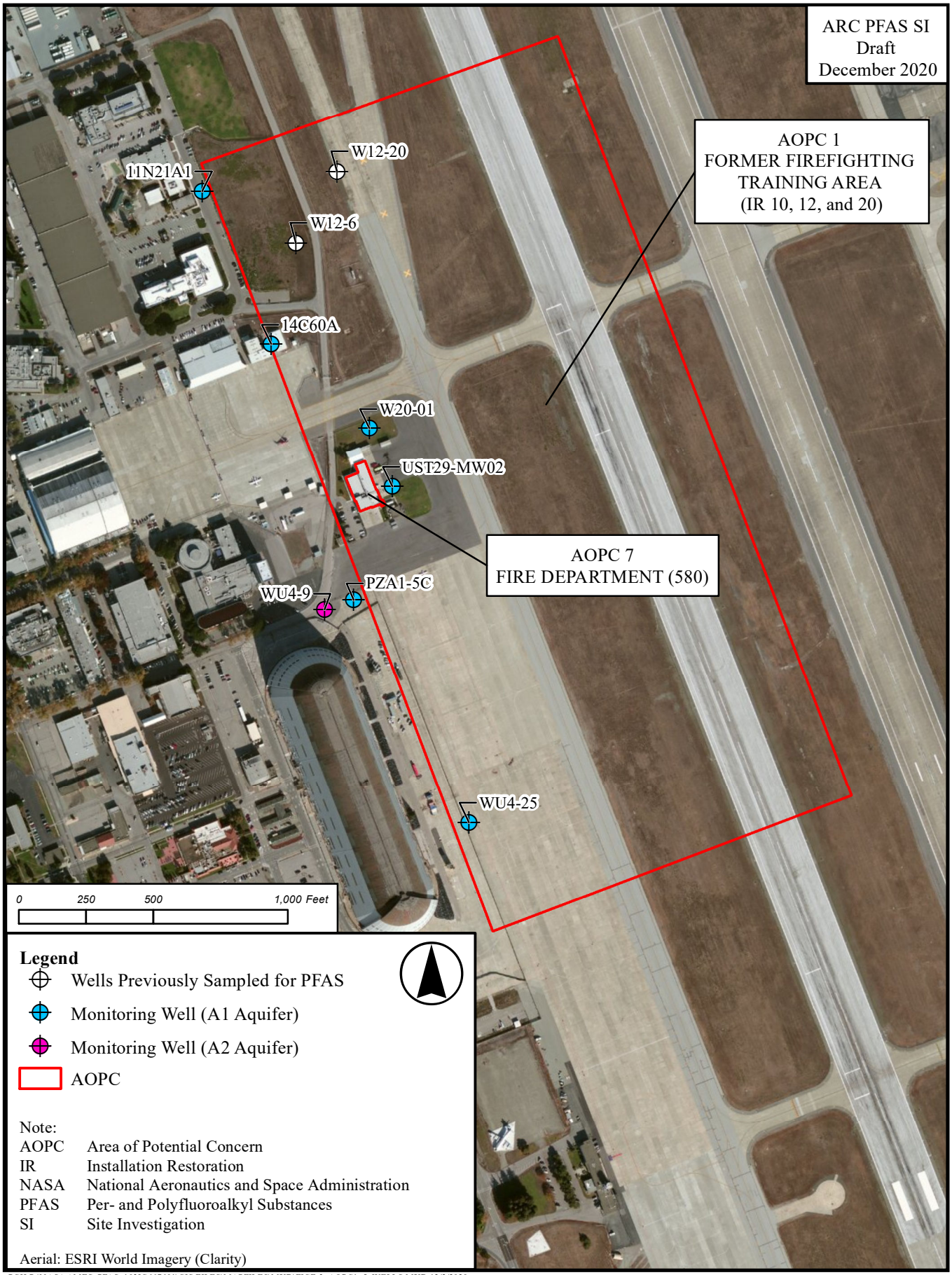
FIGURE A-2 PROPOSED SOIL SAMPLING LOCATIONS

PFAS PRELIMINARY ASSESSMENT FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-2_SOIL_SAMPLES.MXD 12/3/2020

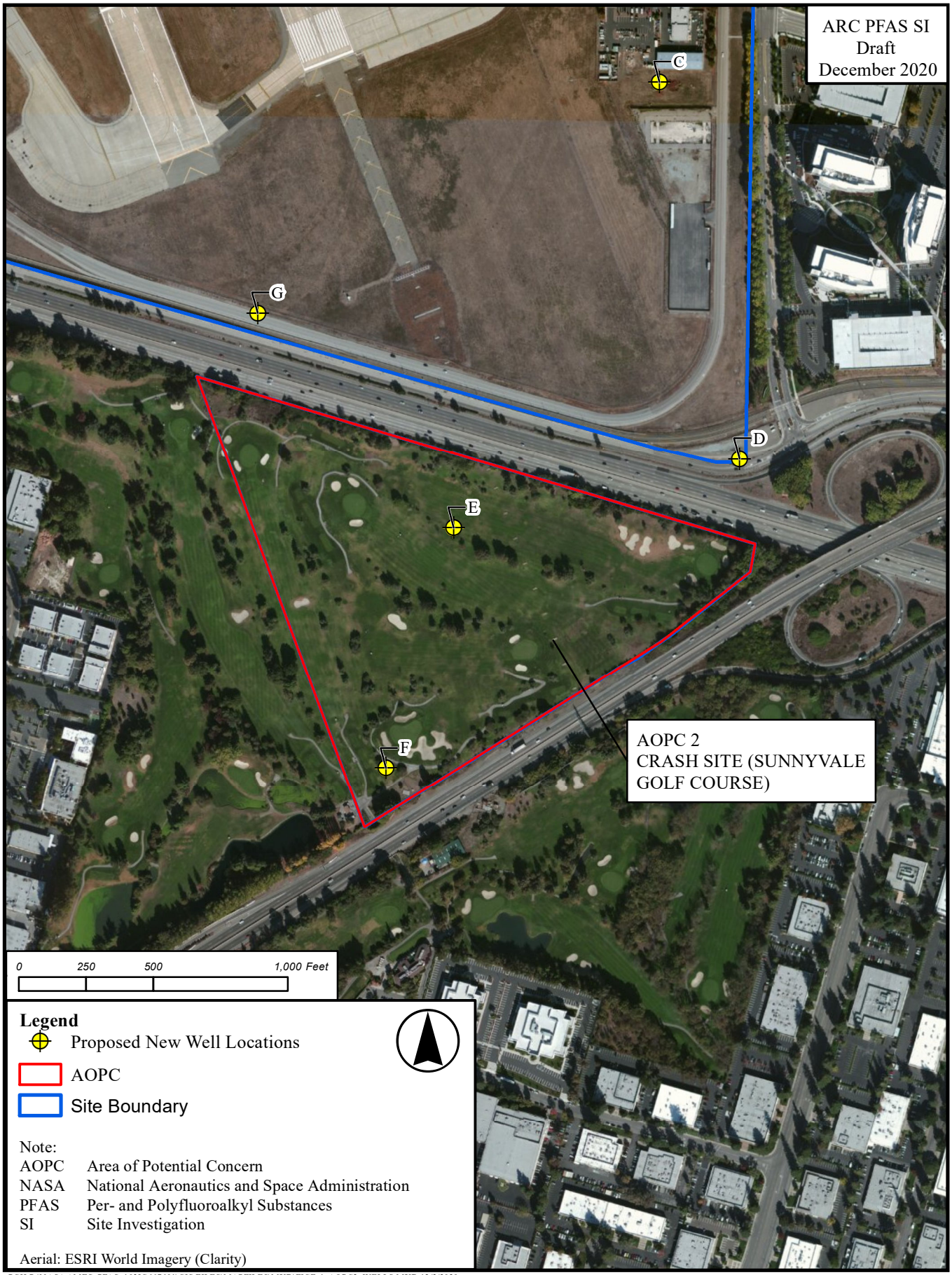
FIGURE A-3 AOPC 1 AND AOPC 7 SELECTED WELLS
PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-3_AOPC1_5_WELLS.MXD 12/3/2020

FIGURE A-4 AOPC 2 SELECTED WELLS

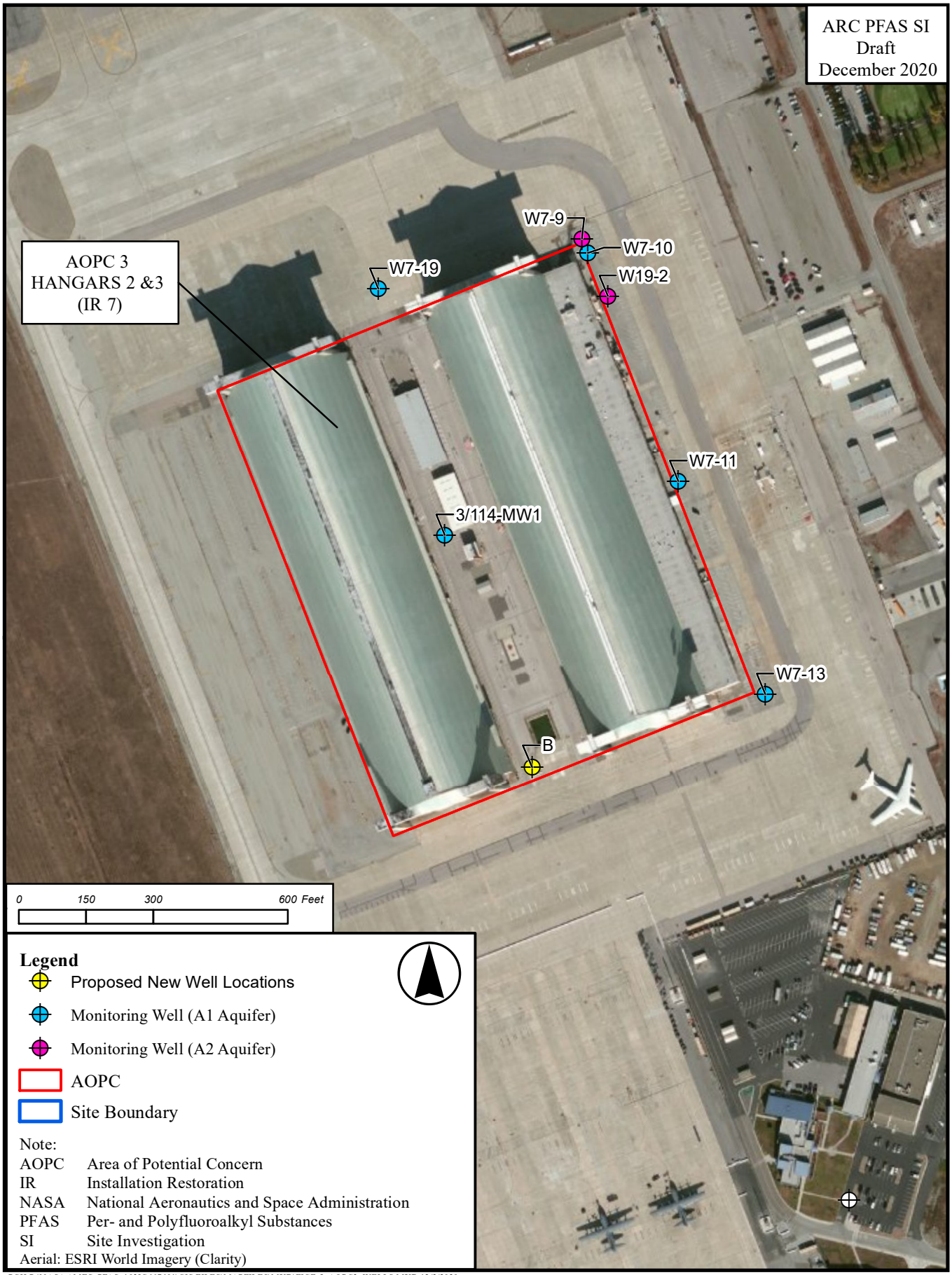
PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-4_AOPC2_WELLS.MXD 12/3/2020

FIGURE A-5 AOPC 3 SELECTED WELLS

PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-5_AOPC3_WELLS.MXD 12/3/2020

FIGURE A-6 AOPC 4 SELECTED WELLS

PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-6_AOPC4_WELLS.MXD 12/3/2020

FIGURE A-7 AOPC 5 SELECTED WELLS

PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-7_AOPC5_WELLS.MXD 12/3/2020

FIGURE A-8 AOPC 6 SELECTED WELLS

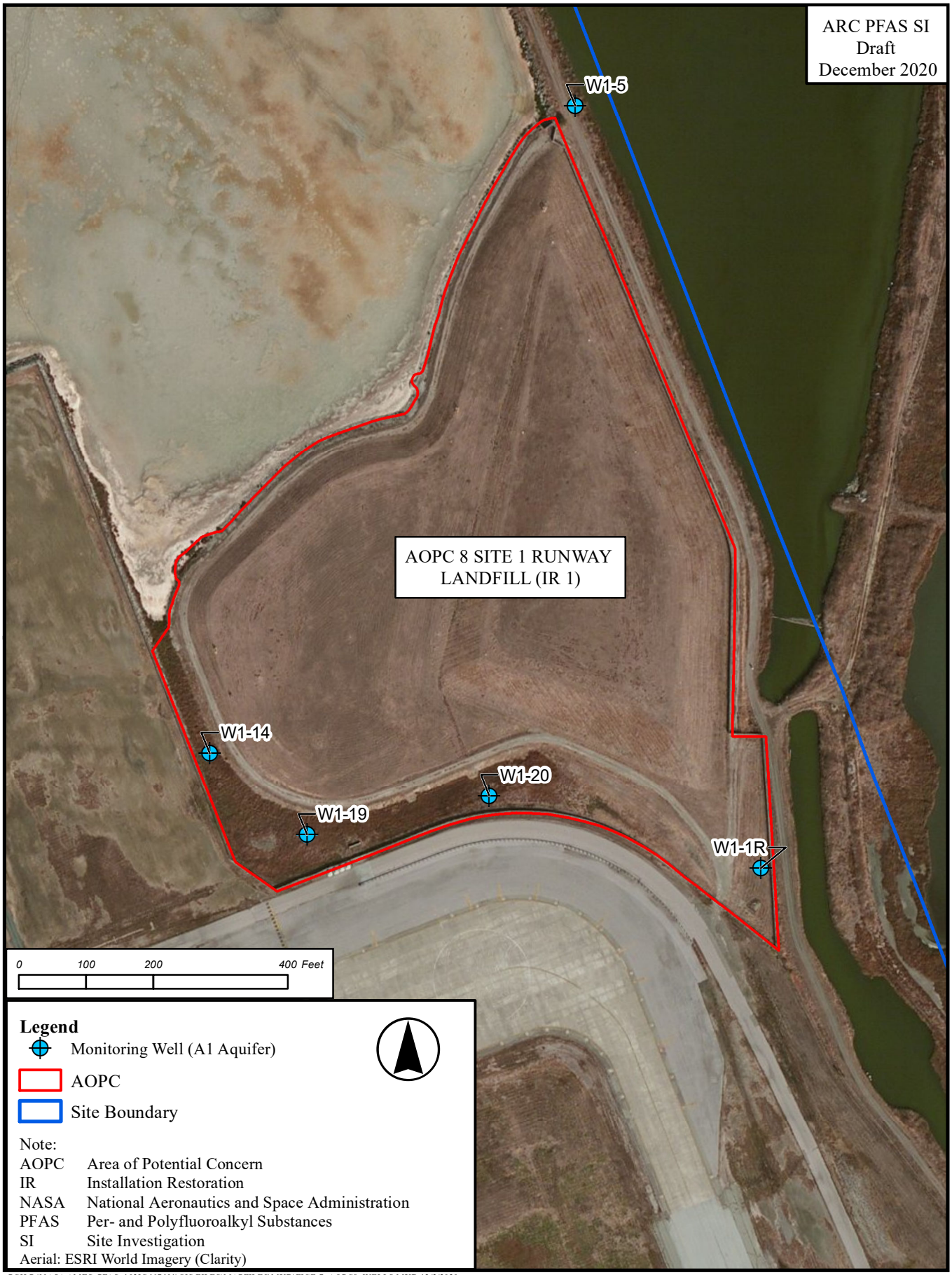
PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-8_AOPC6_WELLS.MXD 12/3/2020

FIGURE A-9 AOPC 8 SELECTED WELLS

PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-7_AOPC8_WELLS.MXD 12/3/2020

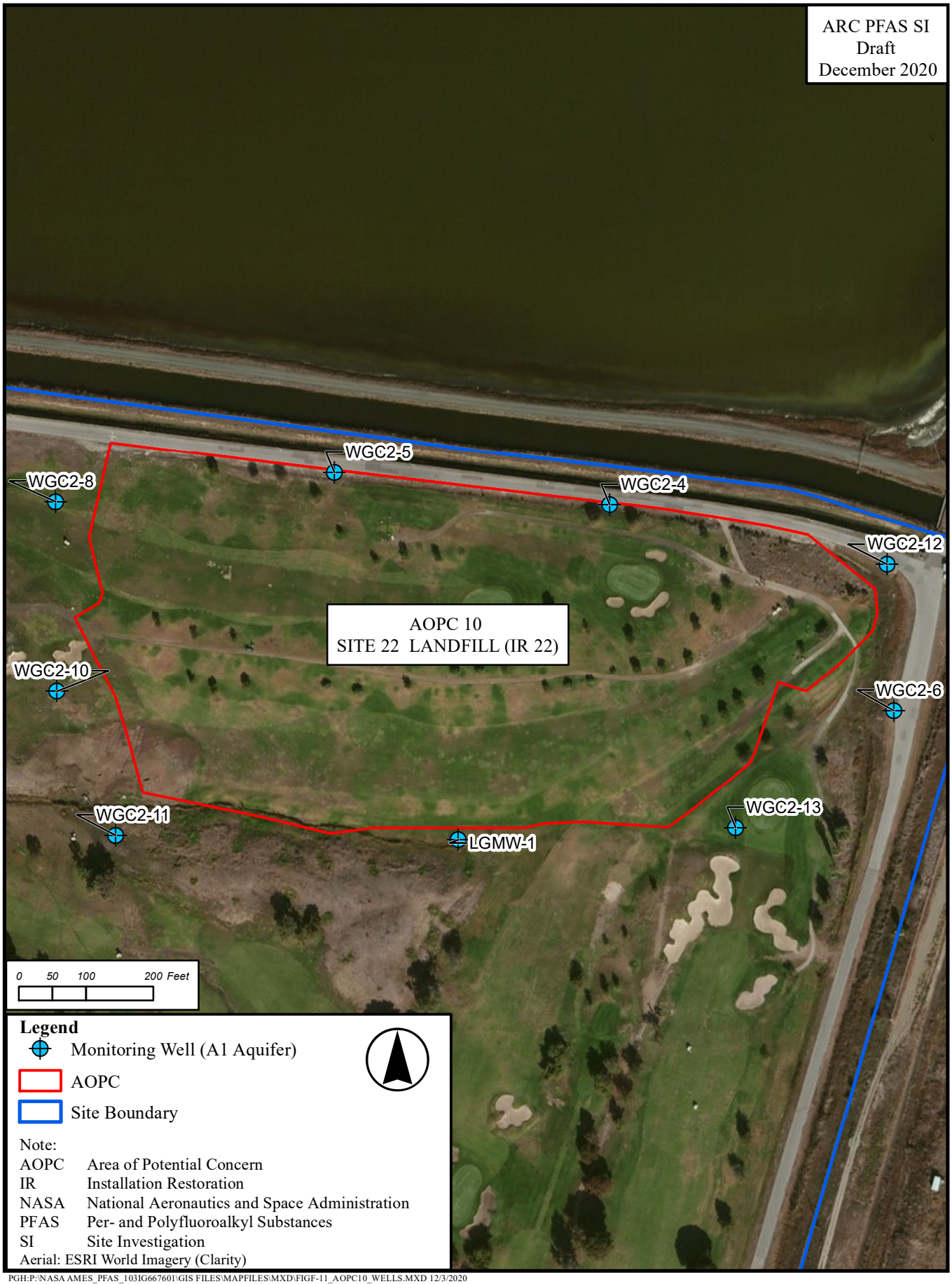
FIGURE A-10 AOPC 9 SELECTED WELLS
PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-10_AOPC9_WELLS.MXD 12/3/2020

FIGURE A-11 AOPC 10 SELECTED WELLS

PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-11_AOPC10_WELLS.MXD 12/3/2020

FIGURE A-12 AOPC 16 SELECTED WELLS

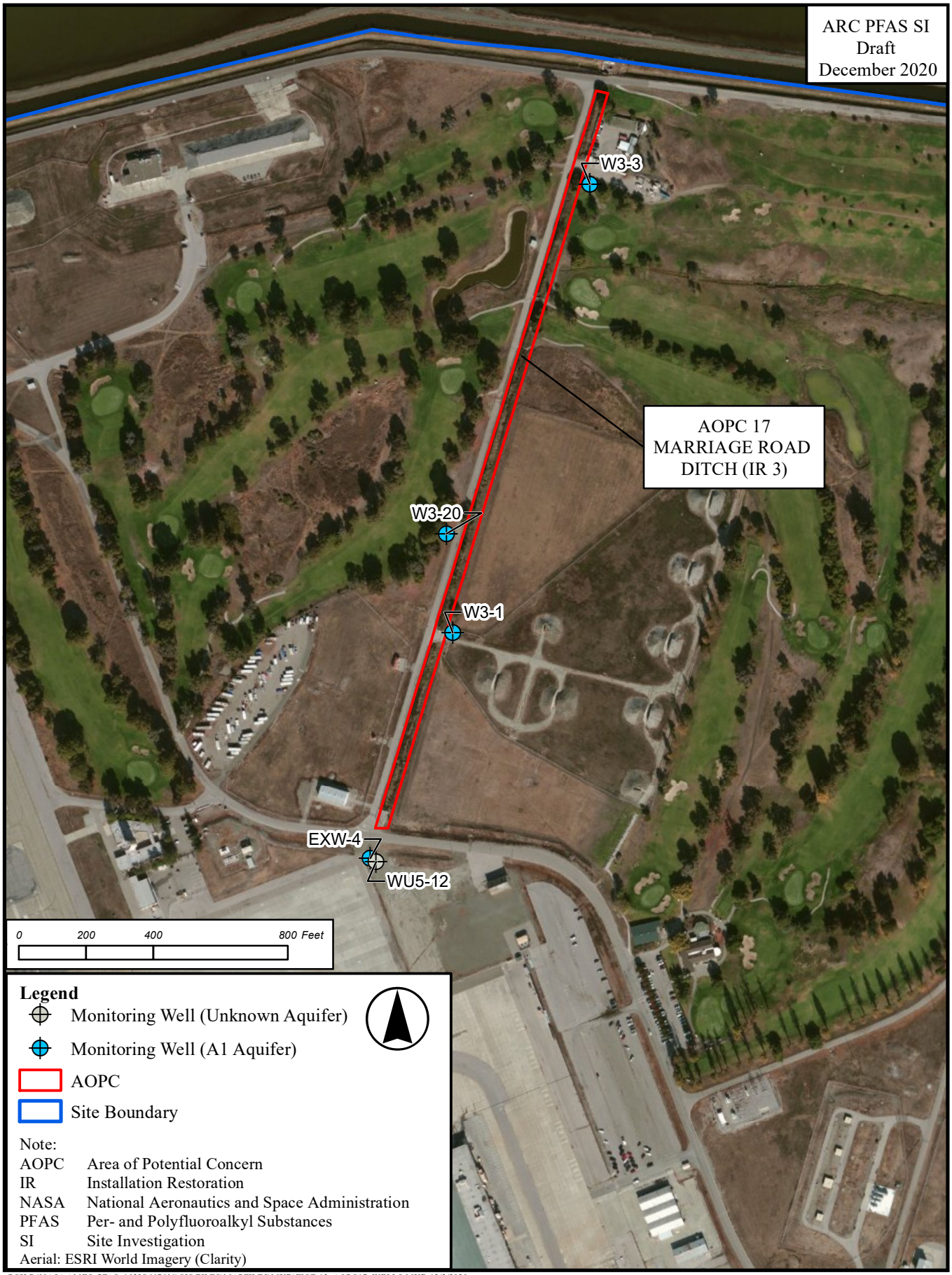
PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-12_AOPC16_WELLS.MXD 12/3/2020

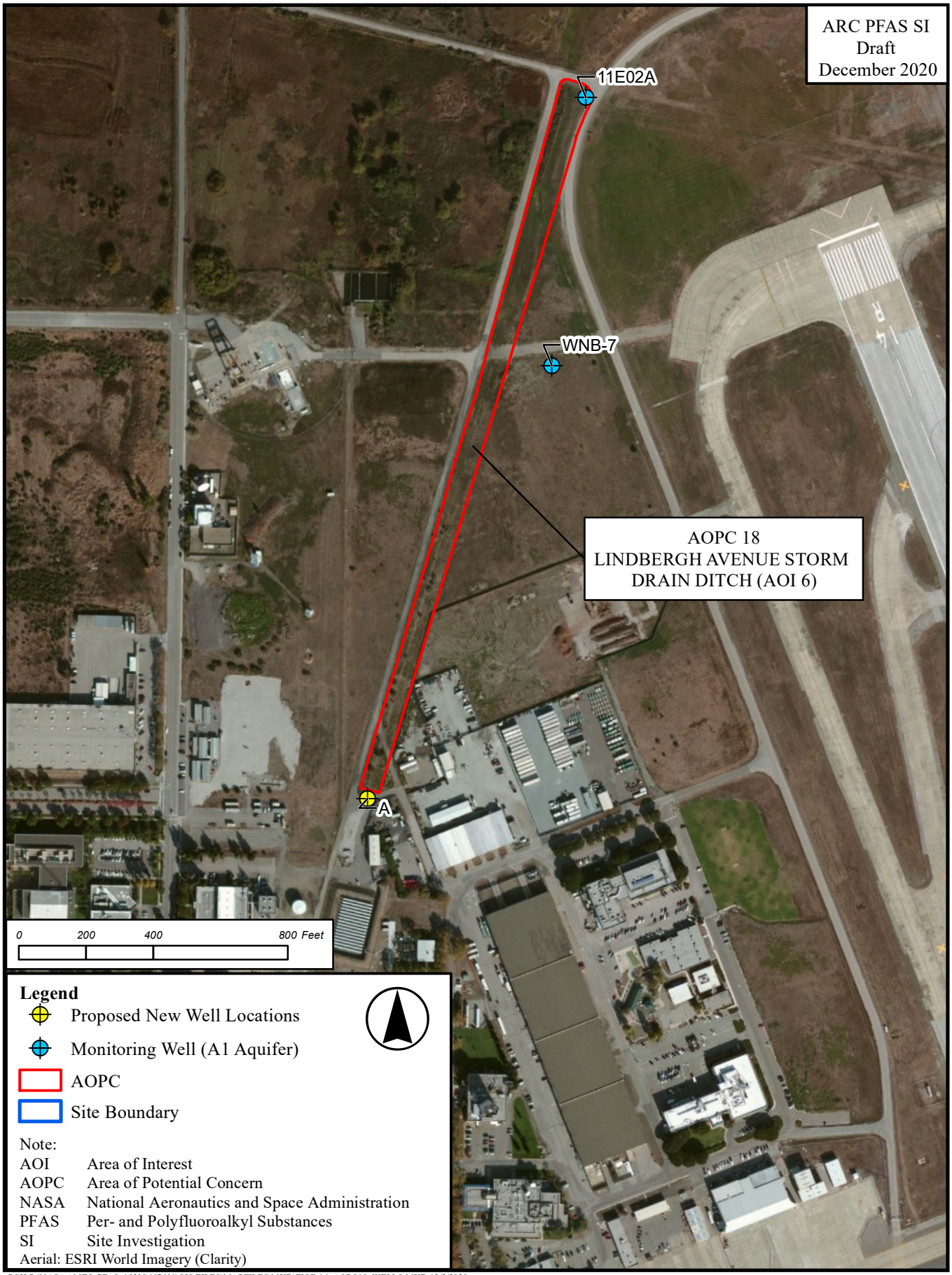
FIGURE A-13 AOPC 17 SELECTED WELLS

PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



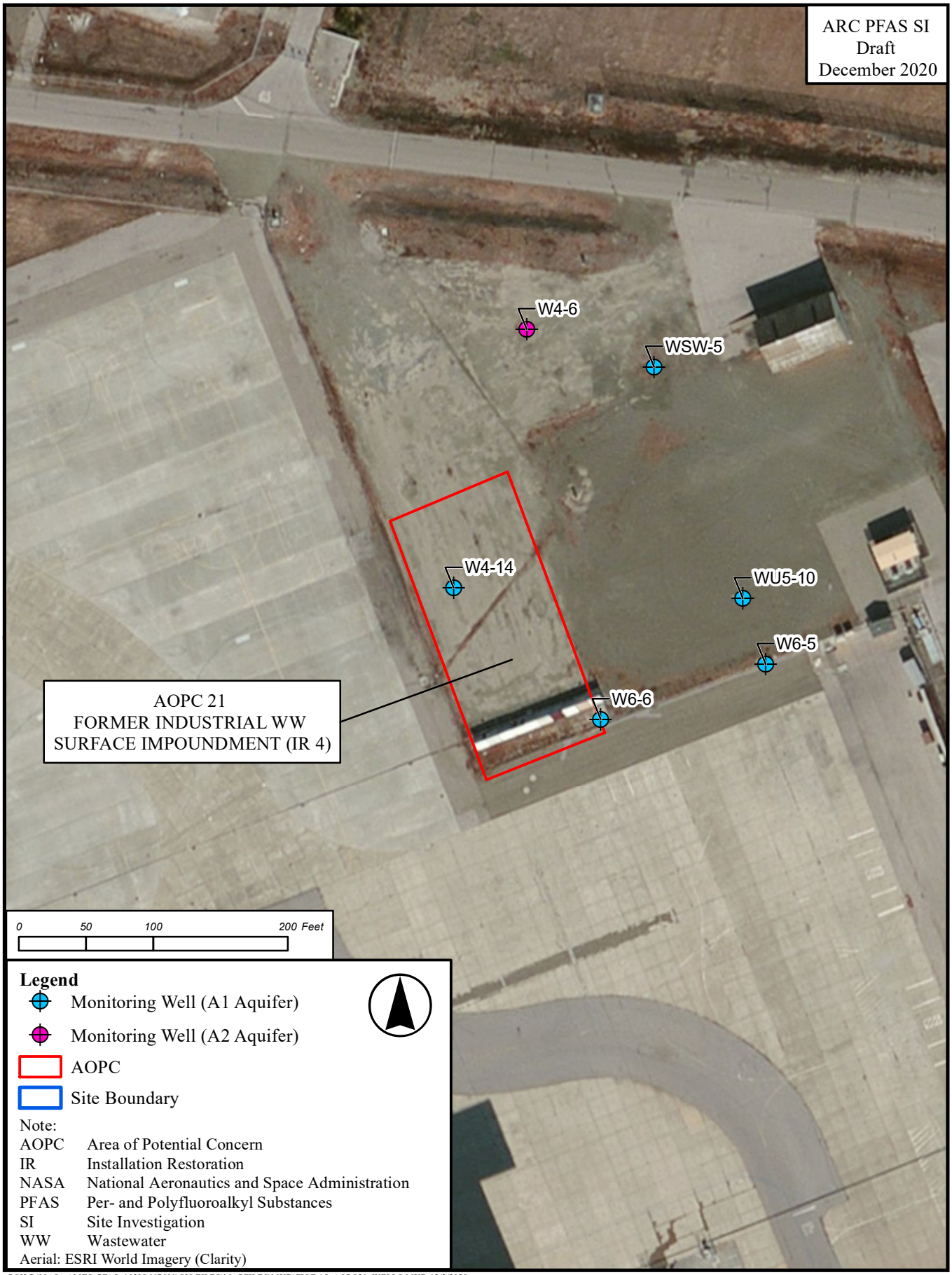
PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-13_AOPC17_WELLS.MXD 12/3/2020

FIGURE A-14 AOPC 18 SELECTED WELLS
PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-14_AOPC18_WELLS.MXD 12/3/2020

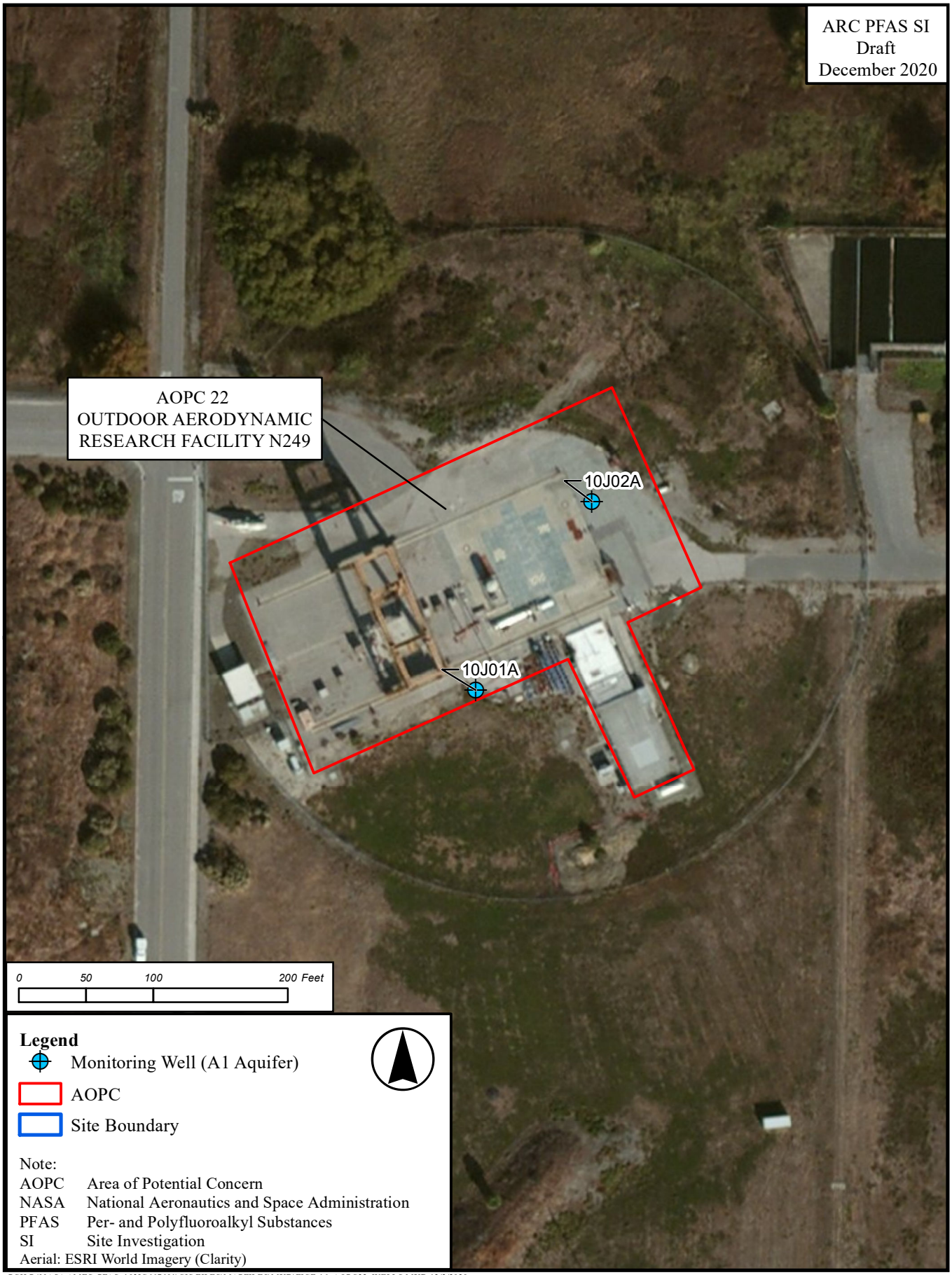
FIGURE A-15 AOPC 21 SELECTED WELLS
PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-15_AOPC21_WELLS.MXD 12/3/2020

FIGURE A-16 AOPC 22 SELECTED WELLS

PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



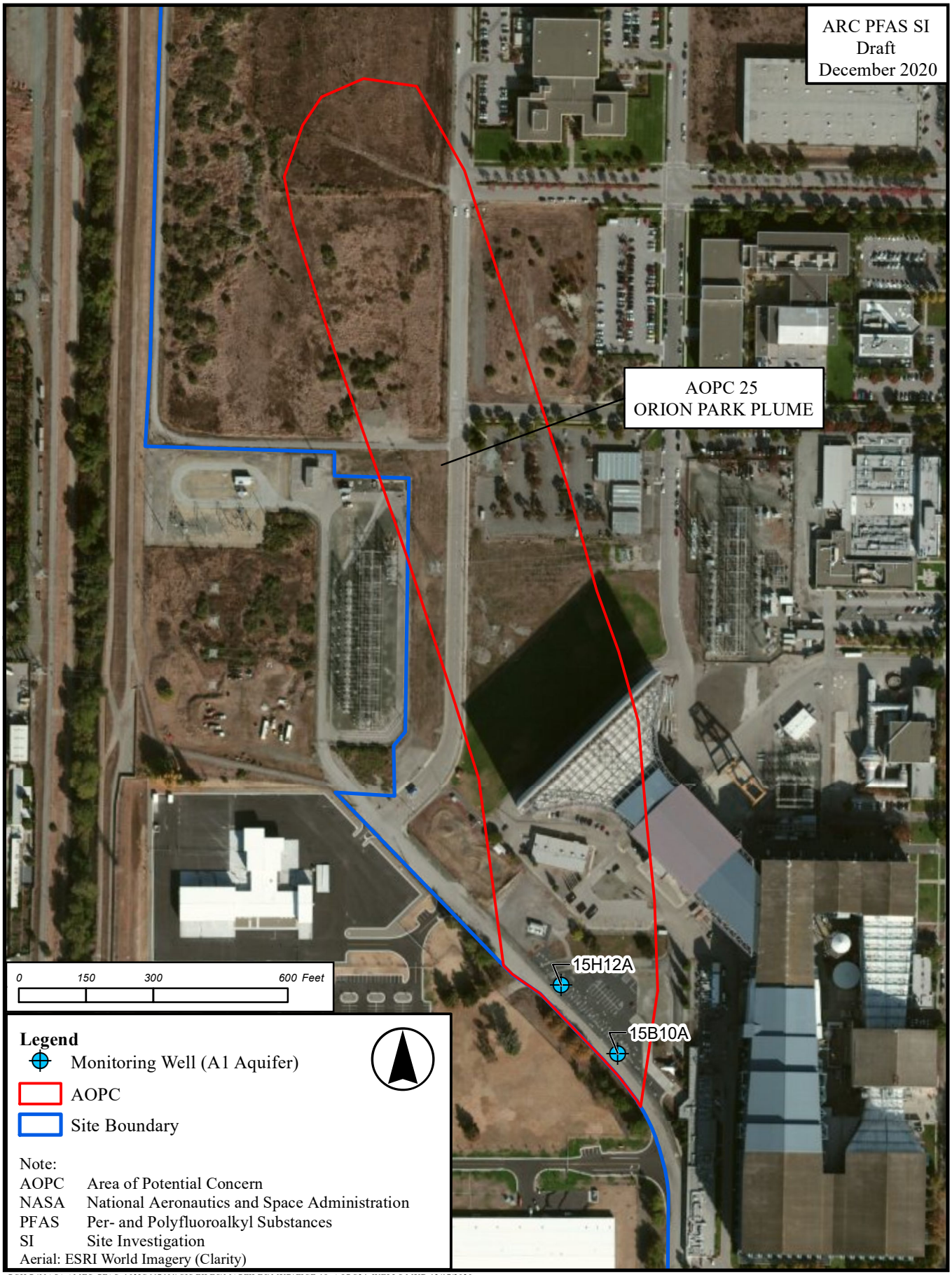
PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-16_AOPC22_WELLS.MXD 12/3/2020

FIGURE A-17 AOPC 24 SELECTED WELLS
PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-17_AOPC23_WELLS.MXD 12/17/2020

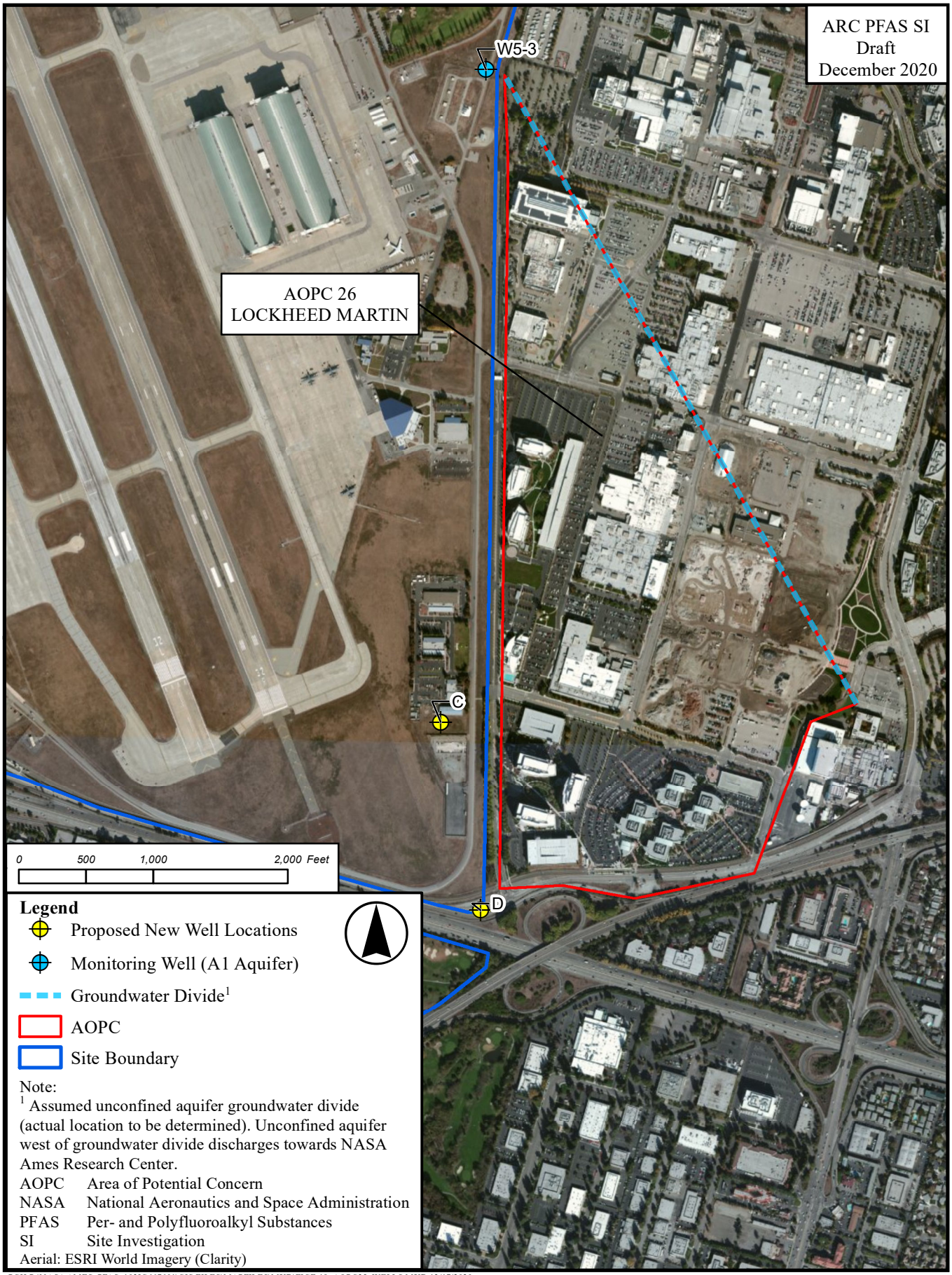
FIGURE A-18 AOPC 25 SELECTED WELLS
PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-18_AOPC24_WELLS.MXD 12/17/2020

FIGURE A-19 AOPC 26 SELECTED WELLS

PFAS SITE INVESTIGATION FOR VARIOUS NASA CENTERS AND FACILITIES



PGH:P:\NASA AMES_PFAS_103IG667601\GIS FILES\MAPFILES\MXD\FIGF-19_AOPC25_WELLS.MXD 12/17/2020

APPENDIX B
PREVIOUS PFAS SAMPLING RESULTS

March 18, 2019

Vista Work Order No. 1900422

Ms. Marcia Christlieb
Earth Resources Technology, Inc.
NASA Ames Research Center, Bldg T20-G, Room 132
Moffett Field, CA 94035-1000

Dear Ms. Christlieb,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 08, 2019 under your Project Name 'Marriage Road Ditch South / 3602-28A Stormwater'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 1900422
Case Narrative

Sample Condition on Receipt:

One water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

PFAS Isotope Dilution Method

The sample was extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method (Modified EPA Method 537). The results for PFHxS, PFOA, and PFOS include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

TABLE OF CONTENTS

Case Narrative..... 1

Table of Contents..... 3

Sample Inventory..... 4

Analytical Results..... 5

Qualifiers..... 9

Certifications..... 10

Sample Receipt..... 13

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1900422-01	MRDS-2019-02-26	26-Feb-19 16:30	08-Mar-19 09:20	HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Earth Resources Technology, Inc.
Matrix: Aqueous
Project: Marriage Road Ditch South / 3602-28A Stormwater

Laboratory Data

Lab Sample: B9C0055-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.00		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1
PFHpA	375-85-9	ND	2.00		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1
PFHxS	355-46-4	ND	2.00		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1
PFOA	335-67-1	ND	2.00		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1
PFNA	375-95-1	ND	2.00		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1
PFOS	1763-23-1	ND	2.00		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	106	60 - 150		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1
13C4-PFHpA	IS	91.1	60 - 150		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1
18O2-PFHxS	IS	94.4	60 - 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1
13C2-PFOA	IS	94.4	60 - 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1
13C5-PFNA	IS	86.3	50 - 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1
13C8-PFOS	IS	84.3	60 - 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 08:32	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR — **PFAS Isotope Dilution Method**

Client Data

Name: Earth Resources Technology, Inc.
Project: Marriage Road Ditch South / 3602-28A Stormwate

Matrix: Aqueous

Laboratory Data

Lab Sample: B9C0055-BS1 Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	40.8	40.0	102	70 - 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1
PFHpA	375-85-9	43.9	40.0	110	70 - 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1
PFHxS	355-46-4	38.7	40.0	96.8	70 - 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1
PFOA	335-67-1	32.4	40.0	81.0	70 - 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1
PFNA	375-95-1	45.6	40.0	114	70 - 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1
PFOS	1763-23-1	35.7	40.0	89.2	70 - 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	117	60- 150		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1
13C4-PFHpA	IS	116	60- 150		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1
18O2-PFHxS	IS	99.2	60- 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1
13C2-PFOA	IS	118	60- 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1
13C5-PFNA	IS	87.1	50- 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1
13C8-PFOS	IS	93.8	60- 130		B9C0055	11-Mar-19	0.250 L	14-Mar-19 19:56	1

Sample ID: MRDS-2019-02-26

PFAS Isotope Dilution Method

Client Data

Name: Earth Resources Technology, Inc.
Project: Marriage Road Ditch South / 3602-28A Stormwater
Matrix: Water
Date Collected: 26-Feb-19 16:30

Laboratory Data

Lab Sample: 1900422-01
Date Received: 08-Mar-19 09:20
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	8.58	1.92		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1
PFHpA	375-85-9	ND	1.92		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1
PFHxS	355-46-4	35.6	1.92		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1
PFOA	335-67-1	11.8	1.92		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1
PFNA	375-95-1	ND	1.92		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1
PFOS	1763-23-1	20.0	1.92		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	91.2	60 - 150		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1
13C4-PFHpA	IS	96.6	60 - 150		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1
18O2-PFHxS	IS	91.6	60 - 130		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1
13C2-PFOA	IS	91.3	60 - 130		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1
13C5-PFNA	IS	87.8	50 - 130		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1
13C8-PFOS	IS	90.8	60 - 130		B9C0055	11-Mar-19	0.260 L	14-Mar-19 08:42	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
D	Dilution
DL	Detection limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limits of Detection
LOQ	Limits of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-19-10
Virginia Department of General Services	9618
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

1900422 5.2°C

ERT CHAIN OF CUSTODY

LAB ID #:

REPORT TO:	Marcia Christlieb **ERT/NASA Ames** Bldg. T20G/Room 142. M/S T20G-4 Moffett Field, CA 94035-1000 (650) 604-5360 marcia.j.christlieb@nasa.gov	LAB:	Vista Analytical Laborat **1104 Windfield Way** El Dorado Hills, CA 95762 (916)673-1520
PROJECT NAME:	Marriage Road Ditch South	INVOICE TO:	**Earth Resources Technology Inc.**
PROJECT NUMBER:	3602-28A Stormwater		**Accounts Payable**
JOB DESCRIPTION	Marriage Road Ditch South 2/26/2019		14401 Sweitzer Lane, Suite 300 Laurel, MD 20707
Quote #:	1011R		

ANALYSIS REQUESTED

6 UCMR3 PFAS

Field Conditions:
pH Temp (Celcius)
MRDS 7.95 16.3

DATE	TIME	SAMPLE ID	MATRIX	CONTAINER(S) No./TYPE	PRESER-VATIVE	6 UCMR3 PFAS	TURN AROUND TIME	SPECIAL INSTRUCTIONS
2/26/2019	4:30 PM	MRDS-2019-02-26	Water	1 - Poly 250 mL	Cold	X	Standard	

SAMPLER: Marcia Christlieb	DATE/TIME: 3/7/19 12:00 PM	RECEIVED BY: FedEx
RELINQUISHED BY: Marcia Christlieb	DATE/TIME: 03/08/19 0920	RECEIVED BY: KML BURKE
RELINQUISHED BY:	DATE/TIME:	RECEIVED AT LAB BY:

Please send results to marcia.j.christlieb@nasa.gov

Vista Analytical Laboratory

Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1900422 TAT Std

Samples Arrival:	**Date/Time** 03/08/19 0920	**Initials:** KE	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 03/08/19 0955	**Initials:** WS	**Location:** WR-2 **Shelf/Rack:** 2-3

Delivered By:	FedEx	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	Ice		Blue Ice		Dry Ice		None

Temp °C: 5.3 (uncorrected)	**Probe used: Y / N**	**Thermometer ID:** IR-4
Temp °C: 5.2 (corrected)		

	YES	NO	NA
Adequate Sample Volume Received? received 1-250mh bottle,	*✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill — Trk # 7746 4704 0889	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	✓
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓

Preservation Documented:	$Na_2S_2O_3$	Trizma	None	Other	Yes	No	NA
Shipping Container	Vista	Client	Retain	Return		Dispose	

Comments: * no backup

October 21, 2019

Vista Work Order No. 1903386

Mr. Jeff Linder
Earth Resources Technology, Inc.
NASA Ames Research Center, Bldg T20-G, Room 132
Moffett Field, CA 94035-1000

Dear Mr. Linder,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on September 28, 2019 under your Project Name 'NASA RGRP'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 1903386
Case Narrative

Sample Condition on Receipt:

Two groundwater and two aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

PFAS Isotope Dilution Method

Samples "W12-20" and "W12-6" contained particulate and were centrifuged prior to extraction.

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above the Reporting Limit. The OPR recoveries were within the method acceptance criteria.

The internal standard recoveries outside the acceptance criteria are listed in the table below.

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
1903386-01	W12-20	PFAS Isotope Dilution Method	13C3-PFBA	H	53.5
1903386-01	W12-20	PFAS Isotope Dilution Method	13C3-PFBS	H	183
1903386-01	W12-20	PFAS Isotope Dilution Method	13C2-4:2 FTS	H	275
1903386-01	W12-20	PFAS Isotope Dilution Method	13C3-PFHxS	H	162
1903386-02	W12-6	PFAS Isotope Dilution Method	13C3-PFBA	H	45.1
1903386-02	W12-6	PFAS Isotope Dilution Method	13C2-4:2 FTS	H	155

H = Recovery was outside laboratory acceptance criteria.

TABLE OF CONTENTS

Case Narrative..... 1

Table of Contents..... 3

Sample Inventory..... 4

Analytical Results..... 5

Qualifiers..... 18

Certifications..... 19

Sample Receipt..... 22

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1903386-01	W12-20	24-Sep-19 11:30	28-Sep-19 10:18	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903386-02	W12-6	26-Sep-19 11:40	28-Sep-19 10:18	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1903386-03	W12-20 field blank	24-Sep-19 11:25	28-Sep-19 10:18	HDPE Bottle, 250 mL
1903386-04	W12-6 field blank	26-Sep-19 11:40	28-Sep-19 10:18	HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Matrix: Aqueous

Laboratory Data

Lab Sample: B9J0017-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFPeA	2706-90-3	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFBS	375-73-5	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
4:2 FTS	757124-72-4	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFHxA	307-24-4	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFPeS	2706-91-4	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFHpA	375-85-9	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFHxS	355-46-4	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
6:2 FTS	27619-97-2	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFOA	335-67-1	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFHpS	375-92-8	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFNA	375-95-1	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFOSA	754-91-6	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFOS	1763-23-1	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFDA	335-76-2	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
8:2 FTS	39108-34-4	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFNS	68259-12-1	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
MeFOSAA	2355-31-9	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
EtFOSAA	2991-50-6	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFUnA	2058-94-8	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFDS	335-77-3	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFDoA	307-55-1	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFTrDA	72629-94-8	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
PFTeDA	376-06-7	ND	2.00		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	89.2	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C3-PFPeA	IS	98.5	60 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C3-PFBS	IS	91.6	60 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C2-4:2 FTS	IS	91.3	20 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C2-PFHxA	IS	99.6	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C4-PFHpA	IS	100	60 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C3-PFHxS	IS	85.0	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C2-6:2 FTS	IS	88.6	40 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C5-PFNA	IS	95.2	50 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C8-PFOSA	IS	26.5	20 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C2-PFOA	IS	97.1	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C8-PFOS	IS	92.5	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C2-PFDA	IS	99.2	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Matrix: Aqueous

Laboratory Data

Lab Sample: B9J0017-BLK1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	92.9	40 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
d3-MeFOSAA	IS	81.7	50 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C2-PFUnA	IS	89.9	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
d5-EtFOSAA	IS	71.3	50 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C2-PFDoA	IS	78.1	30 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1
13C2-PFTeDA	IS	81.7	20 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 07:03	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Matrix: Aqueous

Laboratory Data

Lab Sample: B9J0017-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	41.8	40.0	104	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFPeA	2706-90-3	40.8	40.0	102	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFBS	375-73-5	39.1	40.0	97.8	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
4:2 FTS	757124-72-4	40.7	40.0	102	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFHxA	307-24-4	42.3	40.0	106	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFPeS	2706-91-4	42.2	40.0	105	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFHpA	375-85-9	42.1	40.0	105	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFHxS	355-46-4	43.6	40.0	109	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
6:2 FTS	27619-97-2	44.4	40.0	111	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFOA	335-67-1	40.6	40.0	101	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFHpS	375-92-8	45.7	40.0	114	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFNA	375-95-1	39.9	40.0	99.7	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFOSA	754-91-6	41.8	40.0	105	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFOS	1763-23-1	42.0	40.0	105	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFDA	335-76-2	44.1	40.0	110	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
8:2 FTS	39108-34-4	38.6	40.0	96.5	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFNS	68259-12-1	40.1	40.0	100	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
MeFOSAA	2355-31-9	46.2	40.0	115	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
EtFOSAA	2991-50-6	46.1	40.0	115	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFUnA	2058-94-8	39.6	40.0	99.0	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFDS	335-77-3	36.1	40.0	90.3	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFDoA	307-55-1	43.5	40.0	109	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFTrDA	72629-94-8	44.3	40.0	111	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
PFTeDA	376-06-7	46.0	40.0	115	70 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	82.9	60- 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C3-PFPeA	IS	94.3	60- 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C3-PFBS	IS	94.8	60- 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C2-4:2 FTS	IS	92.9	20- 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C2-PFHxA	IS	95.9	70- 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C4-PFHpA	IS	102	60- 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C3-PFHxS	IS	86.6	60- 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C2-6:2 FTS	IS	78.0	40- 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C5-PFNA	IS	95.3	50- 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C8-PFOSA	IS	53.8	20- 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Matrix: Aqueous

Laboratory Data

Lab Sample: B9J0017-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFOA	IS	97.4	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C8-PFOS	IS	89.3	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C2-PFDA	IS	87.1	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C2-8:2 FTS	IS	89.8	40 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
d3-MeFOSAA	IS	80.1	50 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C2-PFUnA	IS	95.3	60 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
d5-EtFOSAA	IS	76.4	50 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C2-PFDoA	IS	75.3	30 - 130		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1
13C2-PFTeDA	IS	72.0	20 - 150		B9J0017	08-Oct-19	0.250 L	10-Oct-19 06:52	1

Sample ID: W12-20

PFAS Isotope Dilution Method

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Matrix: Groundwater
Date Collected: 24-Sep-19 11:30

Laboratory Data

Lab Sample: 1903386-01
Date Received: 28-Sep-19 10:18
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	675	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFPeA	2706-90-3	2880	40.8	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
PFBS	375-73-5	931	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
4:2 FTS	757124-72-4	8.05	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFHxA	307-24-4	3590	40.8	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
PFPeS	2706-91-4	886	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFHpA	375-85-9	944	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFHxS	355-46-4	10400	40.8	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
6:2 FTS	27619-97-2	2830	40.8	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
PFOA	335-67-1	5540	40.8	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
PFHpS	375-92-8	127	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFNA	375-95-1	111	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFOSA	754-91-6	128	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFOS	1763-23-1	4090	40.8	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
PFDA	335-76-2	13.6	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
8:2 FTS	39108-34-4	1740	40.8	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
PFNS	68259-12-1	ND	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
MeFOSAA	2355-31-9	ND	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
EtFOSAA	2991-50-6	ND	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFUnA	2058-94-8	ND	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFDS	335-77-3	ND	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFDoA	307-55-1	ND	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFTrDA	72629-94-8	ND	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
PFTeDA	376-06-7	ND	2.04		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	53.5	60 - 130	H	B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
13C3-PFPeA	IS	92.1	60 - 150	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
13C3-PFBS	IS	183	60 - 150	H	B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
13C2-4:2 FTS	IS	275	20 - 150	H	B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
13C2-PFHxA	IS	116	70 - 130	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
13C4-PFHpA	IS	126	60 - 150		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
13C3-PFHxS	IS	162	60 - 130	D, H	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
13C2-6:2 FTS	IS	92.9	40 - 150	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
13C5-PFNA	IS	93.5	50 - 130		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
13C8-PFOSA	IS	49.4	20 - 150		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
13C2-PFOA	IS	109	60 - 130	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
13C8-PFOS	IS	62.5	60 - 130	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
13C2-PFDA	IS	99.4	60 - 130		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1

Sample ID: W12-20 **PFAS Isotope Dilution Method**

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Matrix: Groundwater
Date Collected: 24-Sep-19 11:30

Laboratory Data

Lab Sample: 1903386-01
Date Received: 28-Sep-19 10:18
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	116	40 - 150	D	B9J0017	08-Oct-19	0.245 L	18-Oct-19 10:09	20
d3-MeFOSAA	IS	89.8	50 - 150		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
13C2-PFUnA	IS	92.7	60 - 130		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
d5-EtFOSAA	IS	84.4	50 - 150		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
13C2-PFDoA	IS	88.2	30 - 130		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1
13C2-PFTeDA	IS	75.9	20 - 150		B9J0017	08-Oct-19	0.245 L	10-Oct-19 07:13	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: W12-6

PFAS Isotope Dilution Method

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Matrix: Groundwater
Date Collected: 26-Sep-19 11:40

Laboratory Data

Lab Sample: 1903386-02
Date Received: 28-Sep-19 10:18
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	33.9	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFPeA	2706-90-3	66.6	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFBS	375-73-5	76.2	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
4:2 FTS	757124-72-4	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFHxA	307-24-4	208	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFPeS	2706-91-4	65.8	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFHpA	375-85-9	41.7	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFHxS	355-46-4	1150	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
6:2 FTS	27619-97-2	36.8	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFOA	335-67-1	457	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFHpS	375-92-8	40.2	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFNA	375-95-1	3.55	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFOSA	754-91-6	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFOS	1763-23-1	2010	10.7	D	B9J0017	08-Oct-19	0.233 L	18-Oct-19 10:20	5
PFDA	335-76-2	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
8:2 FTS	39108-34-4	4.63	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFNS	68259-12-1	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
MeFOSAA	2355-31-9	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
EtFOSAA	2991-50-6	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFUnA	2058-94-8	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFDS	335-77-3	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFDoA	307-55-1	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFTrDA	72629-94-8	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
PFTeDA	376-06-7	ND	2.15		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	45.1	60 - 130	H	B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C3-PFPeA	IS	89.4	60 - 150		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C3-PFBS	IS	128	60 - 150		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C2-4:2 FTS	IS	155	20 - 150	H	B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C2-PFHxA	IS	87.9	70 - 130		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C4-PFHpA	IS	91.8	60 - 150		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C3-PFHxS	IS	103	60 - 130		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C2-6:2 FTS	IS	134	40 - 150		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C5-PFNA	IS	91.5	50 - 130		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C8-PFOSA	IS	66.2	20 - 150		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C2-PFOA	IS	88.2	60 - 130		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C8-PFOS	IS	101	60 - 130	D	B9J0017	08-Oct-19	0.233 L	18-Oct-19 10:20	5
13C2-PFDA	IS	87.2	60 - 130		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1

Sample ID: W12-6 **PFAS Isotope Dilution Method**

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Matrix: Groundwater
Date Collected: 26-Sep-19 11:40

Laboratory Data

Lab Sample: 1903386-02
Date Received: 28-Sep-19 10:18
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	140	40 - 150		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
d3-MeFOSAA	IS	98.3	50 - 150		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C2-PFUnA	IS	86.5	60 - 130		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
d5-EtFOSAA	IS	81.0	50 - 150		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C2-PFDoA	IS	65.0	30 - 130		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1
13C2-PFTeDA	IS	64.4	20 - 150		B9J0017	08-Oct-19	0.233 L	18-Oct-19 09:58	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: W12-20 field blank

PFAS Isotope Dilution Method

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Location: Field Blank
Matrix: Aqueous
Date Collected: 24-Sep-19 11:25

Laboratory Data

Lab Sample: 1903386-03
Date Received: 28-Sep-19 10:18
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFPeA	2706-90-3	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFBS	375-73-5	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
4:2 FTS	757124-72-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFHxA	307-24-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFPeS	2706-91-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFHpA	375-85-9	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFHxS	355-46-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
6:2 FTS	27619-97-2	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFOA	335-67-1	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFHpS	375-92-8	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFNA	375-95-1	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFOSA	754-91-6	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFOS	1763-23-1	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFDA	335-76-2	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
8:2 FTS	39108-34-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFNS	68259-12-1	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
MeFOSAA	2355-31-9	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
EtFOSAA	2991-50-6	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFUnA	2058-94-8	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFDS	335-77-3	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFDoA	307-55-1	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFTrDA	72629-94-8	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
PFTeDA	376-06-7	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	85.0	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C3-PFPeA	IS	99.9	60 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C3-PFBS	IS	105	60 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C2-4:2 FTS	IS	102	20 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C2-PFHxA	IS	102	70 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C4-PFHpA	IS	99.5	60 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C3-PFHxS	IS	96.4	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C2-6:2 FTS	IS	89.8	40 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C5-PFNA	IS	94.9	50 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C8-PFOSA	IS	52.7	20 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C2-PFOA	IS	102	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C8-PFOS	IS	89.1	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C2-PFDA	IS	95.3	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1

Sample ID: W12-20 field blank

PFAS Isotope Dilution Method

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Location: Field Blank
Matrix: Aqueous
Date Collected: 24-Sep-19 11:25

Laboratory Data

Lab Sample: 1903386-03
Date Received: 28-Sep-19 10:18
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	96.3	40 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
d3-MeFOSAA	IS	78.0	50 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C2-PFUnA	IS	100	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
d5-EtFOSAA	IS	82.7	50 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C2-PFDoA	IS	89.5	30 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1
13C2-PFTeDA	IS	83.3	20 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:34	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: W12-6 field blank

PFAS Isotope Dilution Method

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Location: Field Blank
Matrix: Aqueous
Date Collected: 26-Sep-19 11:40

Laboratory Data

Lab Sample: 1903386-04
Date Received: 28-Sep-19 10:18
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFPeA	2706-90-3	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFBS	375-73-5	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
4:2 FTS	757124-72-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFHxA	307-24-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFPeS	2706-91-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFHpA	375-85-9	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFHxS	355-46-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
6:2 FTS	27619-97-2	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFOA	335-67-1	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFHpS	375-92-8	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFNA	375-95-1	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFOSA	754-91-6	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFOS	1763-23-1	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFDA	335-76-2	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
8:2 FTS	39108-34-4	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFNS	68259-12-1	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
MeFOSAA	2355-31-9	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
EtFOSAA	2991-50-6	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFUnA	2058-94-8	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFDS	335-77-3	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFDoA	307-55-1	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFTrDA	72629-94-8	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
PFTeDA	376-06-7	ND	2.05		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	90.0	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C3-PFPeA	IS	98.4	60 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C3-PFBS	IS	93.9	60 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C2-4:2 FTS	IS	91.0	20 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C2-PFHxA	IS	97.8	70 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C4-PFHpA	IS	101	60 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C3-PFHxS	IS	90.3	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C2-6:2 FTS	IS	89.2	40 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C5-PFNA	IS	89.8	50 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C8-PFOSA	IS	54.4	20 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C2-PFOA	IS	97.9	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C8-PFOS	IS	99.5	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C2-PFDA	IS	89.8	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1

Sample ID: W12-6 field blank

PFAS Isotope Dilution Method

Client Data

Name: Earth Resources Technology, Inc.
Project: NASA RGRP
Location: Field Blank
Matrix: Aqueous
Date Collected: 26-Sep-19 11:40

Laboratory Data

Lab Sample: 1903386-04
Date Received: 28-Sep-19 10:18
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	102	40 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
d3-MeFOSAA	IS	81.5	50 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C2-PFUnA	IS	95.0	60 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
d5-EtFOSAA	IS	74.4	50 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C2-PFDoA	IS	81.6	30 - 130		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1
13C2-PFTeDA	IS	82.5	20 - 150		B9J0017	08-Oct-19	0.244 L	10-Oct-19 07:45	1

RL - Reporting limit

Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
D	Dilution
DL	Detection limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limits of Detection
LOQ	Limits of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-23
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Massachusetts Department of Environmental Protection	N/A
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718-B
New Jersey Department of Environmental Protection	190001
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	016
Texas Commission on Environmental Quality	T104704189-19-10
Vermont Department of Health	VT-4042
Virginia Department of General Services	10272
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1903386 Temp: 1.4 °C
Storage ID: R-13, WR-2 Storage Secured: Yes ☑ No ☐

Project ID: NASA RGRP PO#: 3602-A26 Sampler: Jeff Linder & Mike Nimikoski (name)

TAT (check one): Standard: ☒ 21 days; Rush (surcharge may apply): ☐ 14 days ☐ 7 days Specify:

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Jeff Linder	9/27/19	1430	Kim Farr	09/28/19	

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106
ATTN: Jennifer Miller

Method of Shipment: FedEx
Tracking No.: 776362628021

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFAS by Isotope Dilution: PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	EPA Method 537 (DW only): PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List of 14	537.1 List of 18	Comments
WI2-20	9/24	1130		2	P	GW				X						Modified for groundwater (unpreserved)
WI2-6	9/26	1140		2	P	GW				X						Modified for groundwater (unpreserved)
WI2-20 field Blank	9/24	1125	Field Blank	1	P	-										
WI2-6 field Blank	9/26	1140	Field Blank	1	P	-										

Special Instructions/Comments:

SEND DOCUMENTATION AND RESULTS TO:
Name:
Company:
Address:
City:
Phone:
Email:

Container Types: P= HDPE, PJ= HDPE Jar, PY= Polypropylene, O = Other:

Bottle Preservation Type: TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: GW = Groundwater

Vista Analytical Laboratory

Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 1903386 TAT std

Samples Arrival:	**Date/Time** 09/28/19 1018	**Initials:** KL	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 09/30/19 1041	**Initials:** apn	**Location:** R-13 / WR-2 **Shelf/Rack:** A-1 / E-4

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None

Temp °C: 1.4 (uncorrected)	**Probe used:** Y / (N)	**Thermometer ID:** IR-3
Temp °C: 1.4 (corrected)		

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill ~ Trk # 7801 1282 9552	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	✓

If Chlorinated or Drinking Water Samples, Acceptable Preservation?						✓
Preservation Documented:	$Na_2S_2O_3$ Trizma (None) Other				Yes	No (NA)
Shipping Container	Vista	(Client)	Retain	(Return)	Dispose	

Comments:

Table 1
Summary of PFAS in Soil Samples
CANG Cantonment, Moffett Federal Airfield, Mountain View, California

Composite Sample ID	Composited Boreholes	Approximate Depth Interval (ft bgs)	PFAS (ug/kg) (a)(b)					
			PFBS	PFHpA	PFHxS	PFOA	PFOS	PFNA
2DCOMP-0-2	2GWD1, 2D2	0 to 2	<2.02	<2.02	<2.02	***4.65***	<2.02	<2.02
2DCOMP-2-4	2GWD1, 2D2	2 to 4	<2.08	<2.08	<2.08	<2.08	<2.08	<2.08
2DCOMP-4-6	2GWD1, 2D2	4 to 6	<2.24	*5.22*	<2.24	***6.08***	<2.24	<2.24
3ACOMP-0-2	3GWA1, 3A2	0 to 2	<2.20	<2.20	<2.20	<2.20	<2.20	<2.20
3ACOMP-2-4	3GWA1, 3A2	2 to 4	<2.10	<2.10	<2.10	<2.10	<2.10	<2.10
3ACOMP-4-6	3GWA1, 3A2	4 to 6	<2.20	<2.20	<2.20	<2.20	<2.20	<2.20
CANGVHS	-- (c)	0 to 4	<2.86	*3.33*	<2.86	***8.71***	***13.2***	*7.13*
EPA RSLs (d)			16,000,000	--	--	--	--	--
EPA RSLs for Protection of Groundwater (e)			130	--	--	0.172	0.378	--

Abbreviations:

-- = not analyzed / not available / not applicable
< = less than
CANG = California Air National Guard
EPA = United States Environmental Protection Agency
ft bgs = feet below ground surface
ITRC = Interstate Technology & Regulatory Council
PFAS = per- and polyfluoroalkyl substances
PFBS = perfluorobutane sulfonate
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
PFNA = perfluorononanoic acid
RSL = regional screening level
Vista = Vista Analytical Laboratory
ug/kg = micrograms per kilogram

Notes:

(a) Results reported on a dry-weight basis. *Italics* indicate that the compound was detected. **Bolded** text indicates that the reported concentration is greater than one or more potentially applicable screening levels.
(b) Soil analyzed for specific PFAS using Modified Method EPA 537 by Vista.
(c) Soil sample CANGVHS was collected from hydrovac spoils generated during utility locating activities within the Temporary Engine Shop Area to characterize this material for offsite disposal or potential reuse within the CANG Cantonment.
(d) Screening levels for the protection of human health from EPA's Composite Worker Soil Table (TR=1E-06, HQ=1), May 2018 (https://semspub.epa.gov/work/HQ/197241.pdf).
(e) Screening levels for the protection of groundwater were determined using the EPA's RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) assuming a Hazard Quotient of 1, a Target Risk Level of 10^{-6}, a chronic RfD, and the Soil to Groundwater scenario. RSLs calculated on 29 May 2018.

Table 2
Summary of PFAS in Grab Groundwater Samples
CANG Cantonment, Moffett Federal Airfield, Mountain View, California

Grab Groundwater Location	Approximate Depth of Screened Interval (ft bgs)	**PFAS** (ng/L) (a)(b)					
		PFBS	PFHpA	PFHxS	PFOA	PFOS	PFNA
1GW1	7.5 to 12.5	*53.1*	*7.64*	*722*	***182***	***80.2***	<4.37
2GWD1	12.5 to 17.5	*11.7*	*36.5*	*57.3*	*63.3*	<4.54	<4.54
2GWB1	10 to 15	*9.02*	<4.55	*36.5*	*19.2*	<4.55	<4.55
3GWA1	12.5 to 17.5	*14.0*	*513*	*52.5*	***560***	*36.5*	*223*
3GWB2	10 to 15	*13.1*	*267*	*59.7*	***247***	*35.7*	*10.1*
EB-TUBING	--	<4.25	<4.25	<4.25	<4.25	<4.25	<4.25
EB-TUBING2	--	<4.04	<4.04	<4.04	<4.04	<4.04	<4.04
EB-PVC	--	<4.21	<4.21	<4.21	<4.21	<4.21	<4.21
EPA Lifetime Health Advisories (c)		--	--	--	70	70	--
EPA RSLs		400,000 (d)	--	--	401 (e)	401 (e)	--

Abbreviations:

-- = not analyzed / not available / not applicable
< = less than
CANG = California Air National Guard
EB = equiptment blank
EPA = United States Environmental Protection Agency
ft bgs = feet below ground surface
ng/L = nanograms per liter
PFAS = per- and polyfluoroalkyl substances
PFBS = perfluorobutane sulfonate
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
PFNA = perfluorononanoic acid
RSL = regional screening level
Vista = Vista Analytical Laboratory

Notes:

(a) *Italics* indicate that the compound was detected. **Bolded** text indicates that the reported concentration is greater than one or more potentially applicable screening levels.
(b) Groundwater samples analyzed for specific PFAS using Modified Method EPA 537 by Vista.
(c) EPA Health Advisories for PFOA and PFOS (EPA, 2016a and 2016b). Applies to the individual PFOA and PFOS results AND the sum of PFOA and PFOS results.
(d) Screening levels for groundwater from EPA's Resident Tapwater Table (TR=1E-06, HQ=1), May 2018 (https://semspub.epa.gov/work/HQ/197253.pdf).
(e) Screening levels for the protection of groundwater were determined using the EPA's RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) assuming a Hazard Quotient of 1, a Target Risk Level of 10^{-6}, a chronic RfD, and a Drinking Water scenario. RSLs calculated on 29 May 2018.

Table 2
Summary of PFAS in Grab Groundwater Samples
CANG Cantonment, Moffett Federal Airfield, Mountain View, California

References:

EPA, 2016a. *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA).* EPA Document Number: 822-R-16-005. United States Environmental Protection Agency, Office of Water, Health and Ecological Criteria Division, May 2016.

EPA, 2016b. *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOA).* EPA Document Number: 822-R-16-004. United States Environmental Protection Agency, Office of Water, Health and Ecological Criteria Division, May 2016.

APPENDIX C
PFAS SAMPLING STANDARD OPERATING PROCEDURE

TETRA TECH	STANDARD OPERATING PROCEDURE	Number SA-1.8	Page 1 of 12
		Effective Date 01/25/2018	Revision 3
		Applicability Tetra Tech, Inc., NUS Operating Unit	
		Prepared Earth Sciences Department	
Subject SAMPLE ACQUISITION FOR PERFLUOROALKYL AND POLYFLUOROALKYL SUBSTANCES (PFAS) ANALYSIS		Approved T. Johnston	tom. johnston @tetratech.com Digitally signed by: tom. johnston@tetratech.com DN: CN = tom. johnston@tetratech.com Date: 2018.01.25 14:21:16 -05'00'

TABLE OF CONTENTS

SECTION		PAGE
1.0	**PURPOSE**	**2**
2.0	**SCOPE AND APPLICABILITY**	**2**
3.0	**BACKGROUND**	**2**
4.0	**DEFINITIONS AND ABBREVIATIONS**	**3**
5.0	**SAFETY PRECAUTIONS**	**4**
6.0	**PERSONNEL RESPONSIBILITIES, QUALIFICATIONS, AND TRAINING**	**4**
7.0	**PROCEDURES**	**4**
7.1	SELECTION OF EQUIPMENT	5
7.2	OTHER PRECAUTIONS FOR SAMPLE HANDLING	7
7.3	GROUNDWATER SAMPLE ACQUISITION	8
7.4	SOIL SAMPLE ACQUISITION	8
7.5	SURFACE WATER AND SEDIMENT SAMPLE ACQUISITION	9
7.6	WATER SUPPLY SAMPLING	10
7.7	FIELD REAGENT BLANK COLLECTION	11
7.8	DISPOSAL OF INVESTIGATION-DERIVED WASTE POTENTIALLY CONTAINING PFAS	11
8.0	**REFERENCES**	**12**

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the methods and protocols to be used for collecting and handling samples to be analyzed for polyfluoroalkyl and perfluoroalkyl substances (PFAS). PFAS are present in many consumer products including some typical sampling equipment and are widely present in the environment.

Low regulatory criteria and high contamination potential require special precautions to be implemented to avoid compromising sample integrity. Instructions are provided herein for collection of environmental samples without contaminating them. This SOP is designed to supplement but not replace existing sampling SOPs SA-1.1, SA-1.2, SA-1.3, SA-1.7, and SA-5.1. In addition, some clients and/or projects may have specific PFAS-related sampling requirements that extend beyond the procedures described in this SOP. Such additional requirements typically are documented in work plans or similar documents.

2.0 SCOPE AND APPLICABILITY

This document provides information on selection of proper sampling equipment and techniques for groundwater, surface water, sediment, soil, and water supply sampling for PFAS analysis. Sampling of air or biota is not addressed in this SOP, but the same principles would apply for those media.

3.0 BACKGROUND

PFAS have been used since the 1940s as manufacturer-applied oil and water repellants on products such as clothing, upholstery, paper, and carpets and in making fluoropolymers for non-stick cookware. They are found in textiles and leather products, mist suppressants for metal plating, materials used in the photography industry, photolithography, semi-conductors, paper and packaging, coatings, cleaning products, pesticides, and cosmetics. They have been used in well-known consumer products including Teflon, StainMaster, Scotchgard, and GoreTex. In the 1960s, aqueous film-forming foam (AFFF) containing PFASs was developed for fighting flammable liquid fires, particularly petroleum-fueled (Class B) fires (ATSDR, 2009). The two most researched and most prevalent PFAS in the environment are perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) (ATSDR, 2009).

Military uses of PFAS have been primarily related to fire fighting and electroplating. AFFF meeting MIL-F-24385 specifications was developed by various manufacturers for use in extinguishing fires at military bases, airports, commercial facilities, and fire-fighting training facilities throughout the United States. Beginning in the late 1960s the United States Department of Defense (DoD) used large quantities of AFFF for shipboard and shore facility fire-suppression systems, on fire-fighting vehicles, and at fire-training facilities. AFFF concentrate that contains PFAS may still be in use at DoD facilities, and large quantities of AFFF may have been released to the environment at some facilities.

PFAS are persistent in the environment, tend to bioaccumulate, and demonstrate toxicity in laboratory animals, enough to raise concerns about their presence in the environment. Some areas where PFAS may have been released to the environment include the following:

- Fire-fighting training areas
- Areas where fire-fighting products/materials are stored
- Aircraft crash sites
- Metal coating and plating facilities
- Water treatment systems and receiving water bodies
- Airport hangars and other facilities storing fire-fighting foams
- Fluorochemical manufacturing, use, and disposal facilities

PFAS are ubiquitous in consumer products and are present in or on some materials used in environmental sampling (e.g., Teflon tubing, waterproof logbooks, and GoreTex field clothing). Laboratory detection limits are low for PFAS, and contact of sample material or sampling equipment with any one of the multitude of PFAS sources could result in detectable contamination. In addition, PFAS tend to adsorb to glass and some plastics, so certain glass or plastic sample collection containers are inappropriate for use in PFAS sample collection. Adsorption to sample containers may result in a low bias for measured PFAS concentrations.

Collection and analysis of quality control blanks is an important aspect of verifying that samples have not been contaminated during sample collection and handling. Use of additional blanks or blanks of a different type than usual may be required in some circumstances, and the governing project planning documents should be consulted. Consult Section 7.7 of this SOP for instructions regarding collection of field reagent blanks (FRBs).

4.0 DEFINITIONS AND ABBREVIATIONS

AFFF – Aqueous film-forming foam.

Emerging Contaminant – An emerging contaminant is a chemical or material that is characterized by a perceived, potential, or real threat to human health or the environment or by a lack of published health standards (U.S. EPA, 2014). A contaminant may also be "emerging" because a new source or a new pathway for human exposure has been discovered or a new detection method or treatment technology has been developed (DoD, 2011).

FRB – Field Reagent Blank. A blank sample prepared in the field by transferring laboratory-supplied, chemically preserved, deionized water to an empty, laboratory-supplied, collection bottle. FRBs are typically analyzed only for PFAS and are treated as site samples in all respects, including shipment to the sampling site, exposure to sampling site conditions, storage, preservation, and all PFAS analytical procedures. The purpose of FRBs is to indicate whether PFAS measured in corresponding site samples may have been introduced during sample collection and handling.

PFAS – Per- and Polyfluoroalkyl Substances. A reference term currently in use, replacing "PFCs" in recent scientific and other technical literature. The term is inclusive of both perfluorinated chemicals like PFOA and PFOS and polyfluoroalkyl substances like fluorinated telomers.

PFCs – Perfluorinated Compounds or Chemicals. PFCs are a family of man-made chemicals that have been used for commercial, industrial, and military applications because they resist thermal degradation and repel oil, stains, grease, and water.

PFOA – Perfluorooctanoic Acid. PFOA is used as an aqueous dispersion agent and in the manufacture of fluoropolymers (including Teflon) used in industrial components such as electrical wire casings, fire- and chemical-resistant tubing, and plumbing seal tape. PFOA is used in surface treatment products to impart oil, stain, grease, and water resistance. PFOA can also be produced by the breakdown of some fluorinated telomers.

PFOS – Perfluorooctane Sulfonate. PFOS was a key ingredient in Scotchgard and used in the manufacture of Class B AFFF used per DoD military specifications. Phase out of AFFF by 3M occurred in 2002.

5.0 SAFETY PRECAUTIONS

Sample acquisition activities shall be conducted in accordance health and safety requirements identified in the project-specific Health and Safety Plan (HASP), Accident Prevention Plan (APP), and corporate health and safety policies. Alteration may be necessary to allow sample collection without cross contamination as dictated by site-specific conditions.

Caution

The use of personal protective equipment (PPE) containing PFAS (e.g., some insect repellants, sunscreens, traffic safety vests, etc.) should be avoided if possible or, if deemed necessary to control hazards, should be carefully considered as they can pose a potential cross-contamination risk for samples. Extra care (e.g., changing outer gloves) must be exercised to ensure that PFAS is not transferred directly or indirectly from PPE to samples or sample containers.

The Tetra Tech Project Manager (PM), in coordination with the Tetra Tech NUS Operating Unit Health and Safety Group, shall ensure that the development of project-specific plans balances the need to control exposure to safety hazards as well as address PFAS contamination risks.

6.0 PERSONNEL RESPONSIBILITIES, QUALIFICATIONS, AND TRAINING

Project Manager (PM) – The PM along with the management team are responsible for determining sampling objectives, initial sampling locations, and field procedures used in the collection of samples of environmental media. Additionally, in consultation with other project personnel (geologist, hydrogeologist, etc.), the PM is responsible for selecting and detailing the specific sampling techniques and equipment to be used and for providing detailed input in this regard to the project planning documents. The PM has the overall responsibility for ensuring that sampling activities are properly conducted by appropriately trained staff.

Site Safety and Health Officer (SSHO) – The SSHO (or a qualified designee) is responsible for providing the technical support necessary to implement the project HASP, APP, or equivalent. The SSHO or SSHO designee may also be required to advise the Field Operations Leader (FOL) on safety-related matters regarding sampling, such as measures to mitigate potential hazards, hazardous objects, or conditions.

Project Geologist/Sampler – The project geologist/sampler is responsible for proper acquisition of samples in accordance with this SOP or other project-specific documents. In addition, this individual is responsible for the completion of all required paperwork (e.g., sample log sheets, field notebook, boring logs, container labels, custody seals, and chain-of-custody forms) associated with the collection of those samples.

Field Operations Leader (FOL) – This individual is primarily responsible for the execution of the field sampling program in accordance with the project planning documents. This is accomplished through management of a field sampling team for the proper acquisition of samples.

Personnel implementing this SOP must read and understand this SOP prior to collection of samples designated for PFAS analysis.

7.0 PROCEDURES

The following sampling procedure establishes requirements for collection of samples designated for PFAS analysis while minimizing potential cross contamination of the samples and other materials.

7.1 Selection of Equipment

It is important to research available equipment and materials at the project planning stage to avoid last-minute problems in the field, for example, ensuring compatibility of high-density polyethylene (HDPE) tubing with fittings for use in a peristaltic or other pump, or ensuring that equipment (e.g., a bladder pump) does not contain Teflon.

Sampling Equipment:

Note: PFAS cross-contamination of samples can be minimized through decontamination or conditioning of equipment left in a well. Use of dedicated equipment also is helpful so that handling during decontamination is unnecessary.

- Decontamination – All reusable equipment used in sample acquisition should be adequately decontaminated prior to use.

- Unless project requirements indicate otherwise, use sampling equipment made of stainless steel, acetate, silicone, or HDPE. This applies to tubing, pumps and pump components, tape for plumbing fittings, trowels, mixing bowls, or other equipment that could contact the sample media. Gasket and O-ring components of sampling equipment may also contain fluoropolymers.

Note: PFAS on purchased or rented items is likely to occur predominantly in newly manufactured or rented items treated with chemicals containing PFAS. Therefore, all rental equipment that will make direct contact with the material being sampled must be thoroughly decontaminated prior to use, especially if the equipment items are new.

- Use sampling equipment that does not include or containing polytetrafluoroethylene (PTFE) or Teflon (DuPont brand name) or fluorinated ethylene propylene (FEP) during sample handling or mobilization/demobilization.

- Use products that are not made of low-density polyethylene products (LDPE) if contamination from those products can be transferred to environmental samples or QC samples.

- For collecting drinking water samples to be analyzed using United States Environmental Protection Agency (U.S. EPA) Method 537, use polypropylene sample bottles with a polypropylene screw cap; for all other samples, use HDPE containers with unlined plastic screw caps.

Non-Sampling Field Equipment:

- Non-waterproof loose-leaf paper or notebooks are acceptable. Avoid using waterproof field books or paper during sampling activities, although "Rite in the Rain" books have been found empirically to be acceptable. Do not use plastic clipboards, binders, or spiral hard-cover notebooks that may be coated; use Masonite or aluminum clipboards instead.

- Avoid using Post-it notes or similar removable notes during sample handling or mobilization/demobilization activities.

- Use ballpoint pens or pencils for note taking and sample bottle labeling. Avoid using Sharpies or similar indelible markers.

- Avoid the use of aluminum foil.

Field Personnel Clothing and Protective Gear:

- Wear clothing that has been washed at least six times without fabric softener to remove possible stain-resistant coatings. Clothing made of natural fibers such as cotton is preferred to other fabrics. Protective clothing must be washed in accordance with manufacturer recommendations to ensure that the protective properties necessary to control safety hazards (e.g., fire-retardant clothing) are not compromised.

- Avoid unnecessary contact with upholstery in vehicles because many such fabrics may be treated with stain-resistant materials that could contain PFAS. Typically, rental vehicles are newer and more likely to pose a contamination risk to samples. Well-washed towels or rags may be placed on the seats to prevent contact with car seats and other materials that could transfer PFAS to clothing worn by samplers. If practical, cover clothing and skin that has been in contact with such upholstery with non-fluorinated clothing.

- During wet weather, use rain gear made from polyurethane or wax-coated materials.

- Avoid wearing water-resistant (e.g., Gore-Tex or similar material) clothing or footwear (e.g., boots) immediately prior to or during sample collection and management.

- Avoid wearing coated Tyvek or similar coated PPE suits.

- Wear un-powdered nitrile gloves at all times while collecting and handling samples, and change gloves often. Anecdotal evidence indicates that changing gloves is one of the most effective methods of reducing or eliminating sample contamination potential; therefore, change to a new pair of gloves prior to collecting each sample.

- Avoid wearing cosmetics, shampoos, moisturizers, hand cream, or other similar personal care products on the day of sampling.

- When expected to be effective, use sunscreens and insect repellants that are made with 100-percent natural ingredients and that the Air Force Civil Engineer Center has identified as acceptable for use. ***These products must be used in accordance with manufacturer recommendations and in combination with controls in the project-specific HASP, APP, and corporate health and safety policies. Multiple applications of these products per work shift may be required to ensure their effectiveness.***

    - Sunscreens: Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss My Face, baby sunscreens that are “free” or “natural.”

    - Sunscreen and insect repellant: Avon Skin So Soft Bug Guard Plus – SPF 30 Lotion

    - Insect Repellent: Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect Repellant, Herbal Armor, California Baby Natural Bug Spray, BabyGanics.

Note: The suitability of these items has not been independently verified. Products containing N-diethyl-meta-toluamide **(**DEET), picaridin, and IR3535 and some oil of lemon eucalyptus (OLE) and para-menthane-diol products are known to provide longer-lasting protection than others. One of the products recommended by the Air Force Civil Engineer Center and listed above, Repel Lemon Eucalyptus Insect Repellant, contains OLE and is most likely to be effective.

Sample Containers and Shipping Materials:

- Avoid the use of glass sample containers, which are believed to result in loss of PFAS through adsorption to the container inner walls.
- Collect samples in clean, laboratory-supplied, plastic bottles only, typically polypropylene for drinking water or HDPE for other matrices.
- Confirm that Teflon-lined caps are not used in sample containers; unlined polypropylene screw caps must be used. It is best to segregate sample containers with Teflon components (e.g., Teflon-lined septa) from PFAS sample containers.
- Avoid using Blue Ice or similar items to cool samples and avoid placing such items in sample coolers for shipping. Use commercially available (e.g., from convenience stores or supermarkets) double-bagged ice instead.

Caution: Samples designated for PFAS analysis must be cooled to achieve a storage temperature of less than 6 °C. Cooling to this temperature may take several hours, and sample temperatures may not achieve 6 °C by the time they arrive at the laboratory. If sample temperatures upon arrival at the laboratory are not less than 10 °C, the laboratory may conclude that sample preservation was compromised and may reject the samples. Therefore, place samples on ice as soon after collection as possible. On warm days, or when a representative from a nearby laboratory picks up the samples, take extra care (e.g., use more ice or delay shipment, if necessary) to ensure that sample temperatures will not exceed 10 °C when the samples arrive at the laboratory.

- Use of commercially available plastic bags (e.g., 3-mil-thick trash can liners) for lining coolers to prevent leakage and to separate potential melt water from chain-of-custody forms is allowed.

7.2 Other Precautions for Sample Handling

- Wash hands thoroughly before sampling and after handling fast food, carryout food, snacks, or other items that may contain PFAS. Do not carry pre-packaged food items such as candy bars or microwave popcorn into sampling areas.
- Assume that shipping tape used for securing coolers could contain PFAS; therefore, take care not to transfer PFAS from tape to samples.
- Minimize exposure of samples to light. This can be done by placing the collected samples into a cooler (with ice) and closing the cooler lid.
- If in doubt about a particular product or item that comes into contact with environmental media to be sampled or is in close proximity to sampling operations, consider collecting and analyzing a rinsate blank using laboratory-supplied PFAS-free water to test the item for contamination potential. Consult the Tetra Tech PM in these cases to verify whether collection of additional blanks is warranted.
- Support personnel that are within 2 to 3 meters of the sample processing area are considered subject to the same restrictions related to precautionary measures for clothing and food as applied to sampling personnel.

These precautions must be observed during sampling activities, especially during water sample collection (groundwater, water supply, and surface water), given the high solubilities of PFAS in water. Examples of

how these precautions may be applied to sampling of specific media are provided in the following sections.

7.3 Groundwater Sample Acquisition

The precautions and requirements identified in Sections 7.1 and 7.2 must be observed for groundwater sampling. Do not proceed any further without reviewing each of those precautions and requirements.

- Collect groundwater samples for PFAS analyses in accordance with this SOP, SOP SA-1.1, and/or project- or client-specific requirements.

- If non-dedicated non-disposable equipment is used between sampling locations, it should be decontaminated with Alconox or Liquinox, unless 1,4-dioxane (a potential component of Liquinox) is also a contaminant of concern. In that case, Liquinox should not be used. Products such as Decon 90, which contains fluorosurfactants, should not be used. Alconox or Liquinox rinses should be followed by a potable water rinse then deionized water rinse.

- If Teflon or LDPE materials are required for the non-PFAS analytes, use multiple sets of containers. Collect samples for PFAS analysis last to ensure adequate purging and conditioning of sampling equipment. If practical to do so, suitable PPE (especially gloves) may also be changed out for PFAS sampling. For example, purge and sample a monitoring well for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals using a peristaltic pump with HDPE and silicone tubing, then collect the material for PFAS analysis or switch to a stainless steel bailer to collect the PFAS samples. If either the proper sampling sequence or proper equipment is unclear, consult the FOL or Tetra Tech PM and record the actual sequence in the field notes.

- If sampling wells that have or had dedicated Teflon or FEP tubing that potentially contained PFAS, remove the dedicated tubing and, using silicone or HDPE tubing, remove at least one well volume from the target sampling interval prior to sampling. Accomplish this removal in a manner that is rigorous enough to remove the entire water column from the well and not just a limited vertical interval of the water column. This will minimize the potential for collecting a sample that was in contact with the Teflon/FEP tubing.

- The use of detergents must be avoided during decontamination of drilling equipment. All equipment must be scrubbed with a plastic brush or steam cleaned and rinsed thoroughly in potable water to clean away any debris or material on exposed surfaces and then triple-rinsed in distilled (American Society for Testing and Materials Grade 3 or better) or deionized water (or Millipore water).

- Sample(s) representing any water collected at the point of use (e.g., water truck or tank on site) used by the driller for drilling purposes must be analyzed for PFAS. See Section 7.8 for guidance on waste management.

- Collect drinking water samples to be analyzed using U.S. EPA Method 537 in clean polypropylene sample bottles with a polypropylene screw cap; for all other samples, use clean, laboratory-supplied, HDPE bottles with unlined plastic screw caps.

7.4 Soil Sample Acquisition

The precautions and requirements identified in Sections 7.1 and 7.2 must be observed for soil sampling. Do not proceed any further without reviewing each of those precautions and requirements.

- Collect soil samples for PFAS analyses in accordance with this SOP, SOP SA-1.3, and/or project- or client-specific requirements. Review client–specific (e.g., DoD component) guidance or previously approved Sampling and Analysis Plans (SAPs).

- Soil sampling equipment should not be constructed of or contain Teflon or other materials likely to contain or be coated with PFAS. Acceptable materials for sampling include stainless steel, acetate, and HDPE.

- If non-dedicated non-disposable equipment is used between sampling locations, it should be decontaminated with Alconox or Liquinox, unless 1,4-dioxane (a potential component of Liquinox) is also a contaminant of concern. In that case, Liquinox should not be used. Products such as Decon 90, which contains fluorosurfactants, should not be used. Alconox or Liquinox rinses should be followed by a potable water rinse then deionized water rinse.

- Collect samples in laboratory-provided HDPE containers specifically designated for PFAS analysis. Do not use glass jars typically used for soil sample collection because some PFAS may irreversibly adsorb to the glass and could create a negative bias in the measured PFAS concentrations. Also consult Section 7.6 if sampling a water supply.

7.5 Surface Water and Sediment Sample Acquisition

The precautions and requirements identified in Sections 7.1 and 7.2 must be observed for surface water and sediment sampling. Do not proceed any further without reviewing each of those precautions and requirements.

- Collect surface water and sediment samples for PFAS analysis in accordance with this SOP, SOP SA-1.2, and/or project- or client-specific requirements.

- Surface water and sediment sampling equipment should not be constructed of or contain Teflon or LDPE materials. Acceptable materials for sampling include HDPE, small amounts of silicone, stainless steel, and acetate. Do not use glass. The bottleware should be supplied clean by the laboratory and specifically designated for PFAS analysis. If transfer bottles are required for collection of surface water samples, the transfer bottles used should be of the same material as the containers designated for submission to the laboratory.

- For surface water sample collection, invert the capped sample bottle, with the opening pointing downward, at least 10 cm below the water surface, 10 cm above the bottom of the water body, and as close to the center of the channel or water body as practical. To collect the sample, uncap the bottle underneath the water surface and point the bottle upward so that gloved hands, sample container, and sampler are downstream of where the sample is being collected.

- For aquatic samples collected from the shoreline or via wading, ensure that waders are constructed of fabric that has not been treated with waterproofing coatings.

- If non-dedicated non-disposable sampling equipment is used between sampling locations, it should be decontaminated with Alconox or Liquinox, unless 1,4-dioxane (a potential component of Liquinox) is also a contaminant of concern. In that case, Liquinox should not be used. Products such as Decon 90, which contains fluorosurfactants, also should not be used. Alconox or Liquinox rinses should be followed by a potable water rinse then deionized water rinse.

7.6 Water Supply Sampling

This section applies to sampling from taps, spigots, faucets, or similar devices for PFAS analysis. The precautions and requirements identified in Sections 7.1 and 7.2 must be observed for water supply sampling. Do not proceed any further without reviewing each of those precautions and requirements.

- Collect water supply samples for PFAS analysis in accordance with applicable portions of SOP SA-1.7 and/or project- or client-specific requirements.

- Water supply sampling equipment (if needed) should not be constructed of or contain Teflon or LDPE materials. Acceptable materials for sampling include HDPE, polypropylene (drinking water sampling only), small amounts of silicone (e.g., short runs of silicone tubing used in peristaltic pumps), stainless steel, and acetate. Non-drinking water supply samples should be collected in clean, laboratory-supplied, HDPE bottleware specifically designated for PFAS analysis (not glass). Collect drinking water samples in clean polypropylene bottles supplied by the laboratory.

- Ensure that sample bottles used to collect chlorinated water samples contain the proper Trizma preservative (5 g/L to preserve and remove chlorine). Non-chlorinated water does not require chemical preservatives designed to remove chlorine.

- If non-dedicated non-disposable equipment is used between sample locations, it should be decontaminated with Alconox or Liquinox.

- Locate the sampling point. If a specific sampling point has already been designated (e.g., a kitchen tap), plan to collect the sample from that point. Otherwise, identify a location in the water supply line that is as close as possible to the water's point of origination (e.g., a well or other water source) and upstream of any local water treatment unit(s) that could affect PFAS levels (e.g., water softeners, activated carbon, or reverse osmosis treatment units). If a treatment unit is in use, a post-treatment sample may also be required in some cases, per project requirements.

  Note: If treatment that could affect PFAS levels (e.g., carbon filtration or reverse osmosis) is part of the water distribution system, often a spigot will be present in the plumbing line between the water source and the treatment unit, and this spigot should be used for sample collection.

- Remove any aerator/diffuser from the faucet, if possible. If removal is not possible, record this observation in the field notes.

- Allow the water to run freely from the tap until water quality parameter stabilization per project-specific requirements is achieved, or as otherwise required by project-specific requirements. This will often require purging for 3 to 5 minutes.

- Reduce the water flow rate to minimize aeration of the sample. The water stream should be no wider than the diameter of a pencil.

- Fill the sample bottle (typically 250 mL) directly from the tap to the bottom of the neck of the bottle, and cap the bottle immediately.

- After collecting the sample, cap the bottle and, if preservative is included, agitate by hand until the preservative is dissolved.

- Do not use filters when collecting samples because the filters may introduce PFAS contamination or absorb PFAS and thus reduce PFAS concentrations in the samples.

7.7 Field Reagent Blank Collection

Note: If PFAS are detected in site samples, FRBs may be analyzed to assess whether PFAS in site samples could be non-site-related contamination and whether resampling is necessary. U.S. EPA Method 537 and modifications thereof for PFAS analysis require an FRB to be handled along with each sample set. A sample set is described as samples collected from the same sample site and at the same time, but "sample site" and "same time" are not precisely defined. Therefore, it is important to verify that the correct number of FRBs will be collected. The intent is to be able to verify whether samples have been contaminated and to help identify the source of contamination. In general, collecting one FRB at each sampling point is recommended when sampling drinking water; fewer FRBs are recommended when sampling non-drinking water matrices. The actual number will depend on project needs. *Collection of an FRB at every sampling point may be required.*

- Verify the number of FRBs to be collected for the project and where those samples must be collected. This should be described in the project planning documents such as work plans or SAPs. If it is not, consult the PM.

- At the sampling site, when ready to collect an FRB, open the bottle of chemically preserved FRB reagent water provided by the laboratory and a corresponding clean empty bottle, also provided by the laboratory.

- Pour the preserved FRB reagent water into the empty sample bottle, close the cap, and label this filled bottle as the FRB.

- Pack and ship the FRB along with site samples and required documentation (e.g., chain-of-custody form) to the laboratory.

Note: Although chain-of-custody forms will indicate that FRBs must be analyzed for PFAS, analysis of an FRB will be required only if site samples contain PFAS greater than a certain concentration. If an FRB is analyzed and any PFAS concentration in the FRB exceeds one-third of the laboratory minimum reporting limit (or equivalent), all samples collected with that FRB may be considered invalid and may require recollection and reanalysis. Consult the project planning documents governing sample collection for specifics as to whether resampling is necessary. Care in collection and handling of site samples and FRBs in a way that avoids contamination cannot be overemphasized.

Note: It will be necessary to associate individual FRBs with corresponding site samples; otherwise, decisions about which samples to recollect (if recollection is indicated) could be compromised. Associations between FRBs and corresponding site samples may be accomplished by marking chain-of-custody forms with the associations, but other methods also may be useful. Consult the governing planning document or the PM for guidance, if necessary.

7.8 Disposal of Investigation-Derived Waste Potentially Containing PFAS

PFAS are not hazardous wastes as defined in the Resource Conservation and Recovery Act and Comprehensive Environmental Response, Compensation, and Liability Act. It may be possible to dispose of PFAS-containing solid waste as non-hazardous, but sampling solid waste material for PFAS analysis is not advised. Consult the client PM or on-site point of contact to verify their current disposal acceptance criteria, and indicate on waste manifests that the waste potentially contains PFAS. Waste water potentially containing PFAS should be analyzed for PFAS to determine the appropriate disposal option. If the sum of PFOS and PFOA concentrations is less than 70 µg/L the water may be disposed of without special handling if no other enforceable regulations apply; otherwise, the water should be treated to reduce the PFOA + PFOS concentration to an acceptable level or should be directed to an appropriate

treatment facility for disposal. On-site treatment (e.g., granular activated carbon filtration) may be appropriate. Consult the client PM or on-site point of contact for direction regarding disposal.

Note: If aqueous investigation-derived waste (IDW) is expected to contain much greater than 70 ng/L (e.g., captured residual from an accidental release in a hangar), special actions may be necessary and the client PM should be consulted. For wastes that are dewatered and potentially contain PFAS, containerize the waste water and analyze it for PFAS prior to disposal.

8.0 REFERENCES

ATSDR, (Agency for Toxic Substances and Disease Registry), Division of Toxicology and Environmental Medicine, 2009. Toxicological profile for perfluoroalkyls. U.S. Government Printing Office. http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=1117&tid=237.

ASTSWMO (Association of State and Territorial Solid Waste Management Officials, Remediation and Reuse Focus Group), Federal Facilities Research Center, 2015. Perfluorinated Chemicals (PFCs): Perfluorooctanoic Acid (PFOA) and Perflurooctane Sulfonate (PFOS), Information Paper. August

DoD (Department of Defense), 2011. Chemical & Material Emerging Risk Alert Aqueous Film Forming Foam (AFFF). Risk Alert # 03-11. Materials of Evolving Regulatory Interest Team.

Department of the Navy, 2014. Perfluorinated Compounds (PFCs) Interim Guidance/Frequently Asked Questions (FAQs). December.

Chemical & Material Emerging Risk Alert Aqueous Film Forming Foam (AFFF). Risk Alert # 03-11. Materials of Evolving Regulatory Interest Team.

NAVFAC, 2017. Interim Per-and Polyfluoroalkyl Substances (PFAS) Site Guidance for NAVFAC Remedial Project Managers (RPMs)/September 2017 Update.

New Hampshire Department of Health and Human Services, 2014. Fact Sheet, Perfluorinated Chemicals (PFCs). May.

U.S. EPA (United States Environmental Protection Agency), 2009. Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS), Version 1.1, EPA/600/R-08/092. September.

U.S. EPA (United States Environmental Protection Agency), 2014. Emerging Contaminants – Perflurooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA). Emerging Contaminants Fact Sheet – PFOS and PFOA. EPA-50-F-14-001. March.

U.S. EPA, 2015. Perfluorooctanoic Acid (PFOA) and Fluorinated Telomers – Frequent Questions. http://www.epa.gov/oppt/pfoa/pubs/faq.html. Accessed April 27.

APPENDIX D
FIELD DOCUMENTATION

CULTURAL RESOURCES AWARENESS ACKNOWLEDGEMENT

Ames Research Center, Moffett Field

Project: PFAS SI

I have received a copy of the archaeological "ALERT" sheet and agree to comply with the requirements on the sheet. I understand that I am accountable for my actions and that failure to comply with the requirements may have negative implications for the project.

DATE: 7/14/21

	SIGNATURE	PRINT NAME	COMPANY/AFFILIATION
1.		VICTOR EARLY	TetraTech
2.		Jorge Ornelas	Penecore
3.		Heriberto Ramirez	Penecore
4.		Armando Lopez	Penecore
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

TETRA TECH

SOIL BORING CLASSIFICATION LOG

Site: NASA Ames Research Center, Moffett Field, CA

Project Name: PFAS Site Inspection

Boring Number: A	Date Started: 7/14/21
Drilling Method: (Circle one) ~~Direct-Push~~ / Hand Auger HA to 5ft BGS	Date Completed: 7/14/21
	Logged By: Victor Early
Diameter of Boring: 8"	Drilling Subcontractor: Pen Core
Depth to Groundwater (if encountered) (feet bgs): 9'	Driller: Jorge Ornelas
Depth to Native Material: 4.5' est.	Notes: Geoprobe

Time	Depth (feet bgs)	Drive Interval	Recovered Interval or % Interval Recovered	Sample ID	Well/construction	Classification	Bare Ground Description
955	5		100%			GM	well graded silty Gravel, angular upto 1" 30% fines, 10% fine sand, dry, dense grayish brown – brown 10yr5/2 10yr5/3
			75%		8	CL	clay, med stiff, moist, med. plasticity v. dark brown 10YR 2/2 to 5.5' olive brown 2.5Y 4/3
	10					SM SP	poorly graded silty sand, 20% fines, wet med-dense, v. fine olive brown 2.5Y 4/4
			75%			CL	silty clay, moist. low plasticity, iron staining olive brown 2.5Y 4/3
	15					SM	poorly graded silty sand, 30% fines wet, med dense v. fine
			90%		18	CL	silty clay, med. stiff, dry, 10% sand & gravel Lt. olive brown
	20						
1100	25		90%			CL	bottom of boring

TETRATECH EM INC

MONITORING WELL COMPLETION RECORD

DRILLING INFORMATION

RIG TYPE Geoprobe HSA
DRILLING BEGAN:
DATE 7/14/21 TIME 1145
BORING DIAMETER (in) 8"
BORING DEPTH (ft) 19(8") 25(2")
WELL INSTALLATION BEGAN:
DATE 7/14/21 TIME 1145
WELL DEPTH (ft) 18
WELL COMPLETION FINISHED:
DATE 7/15/21 TIME 1340

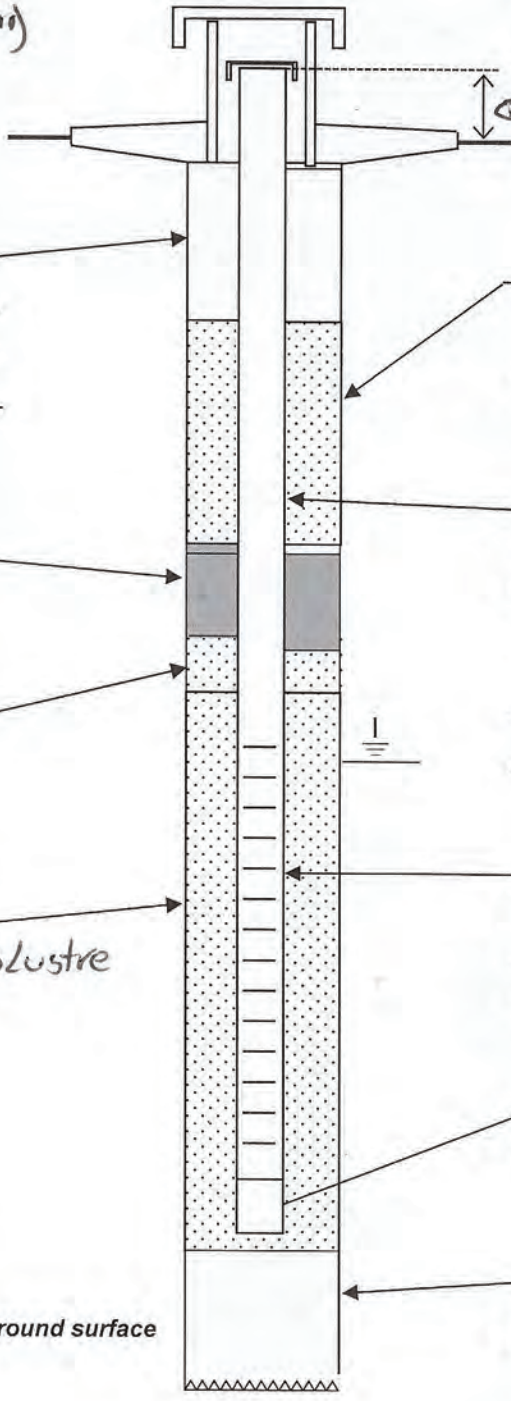
SURFACE COMPLETION

~~ABOVE GROUND W/ CRASH POSTS~~
FLUSH MOUNTED

MONITORING WELL

MONITORING WELL ID A
PROJECT PFAS SITE
SITE NASA AMES RC MOFFETT
BOREHOLE ID A

TOP OF CASING (ft) UNKNOWN
GROUND SURFACE ELEVATION (ft) UNKNOWN



ANNULAR SEAL

PORTLAND CEMENT (lbs) 47
~~BENTONITE (lbs)~~ SAND 100
WATER (gal) 2.5
FROM (ft) 0 TO (ft) 6

BENTONITE/SAND SLURRY

BENTONITE (lbs)
SAND (lbs)
WATER (gal)
FROM (ft) TO (ft)

CASING

TYPE 2" PVC SCHD 40
DIAMETER (in) 2

BENTONITE SEAL

TYPE Pure bold chips
BENTONITE (lbs) 25
WATER (gal) 2.5
FROM (ft) 6 TO (ft) 7

STATIC WATER LEVEL (ft)

FINE SAND

SAND SIZE
SAND (lbs)
FROM (ft) TO (ft)

WELL SCREEN

TYPE 2" PVC SCHD 40
DIAMETER (in) 2"
SLOT SIZE (in) .010
FROM (ft) 8 TO (ft) 18

FILTER PACK

SAND SIZE 2/12 cemex Lapis Lustre
SAND (lbs) 325
FROM (ft) 7 TO (ft) 19

SUMP

FROM (ft) TO (ft)

CENTRALIZERS

INTERVALS

BOREHOLE BACKFILL

TYPE Bentonite
FROM (ft) 19 TO (ft) 25'

All measurements are in feet below ground surface except for well casing stickup

Notes

C:\Users\lgn-sfomv-fd\Downloads\MW Completion Record (1).doc

TETRA TECH

SOIL BORING CLASSIFICATION LOG

Site: NASA Ames Research Center, Moffett Field, CA

Project Name: PFAS Site Inspection

Boring Number: C	Date Started: 7/16/21
Drilling Method: (Circle one) Direct-Push / Hand Auger	Date Completed: 7/16/21
	Logged By: VICTOR EARLY
Diameter of Boring: 8"	Drilling Subcontractor: PeneCore
Depth to Groundwater (if encountered) (feet bgs): 9	Driller: Jorge Ornelas
Depth to Native Material: Unknown	Notes:

Time	Depth (feet bgs)	Drive Interval	Recovered Interval or % Interval Recovered	Sample ID	Well construction	classification	bare ground Description
930	5	X X X X X	100 %			CL	SILTY CLAY, DRY, hard, very dk gray 10yr 3/1
						ML	Silt, sandy, STIFF, dry dk grayish brown 10yr 4/2
	10		70 %		8	GM	Silty Gravel 20% fines, rounded, <1", 20% SAND —WET— olive brown 2.5y 4/3
			60 %			CL	Clay, moist, soft, 20% SAND olive brown 2.5y 4/3
	15						—STIFF— V. DK gray 10yr 3/1 20% SAND
			70 %			CL	SANDY CLAY soft, moist DK grayish brn 2.5y 4/2
	20				18	SP	Poorly graded SAND med-fine, 10% fines wet loose V. DARK grayish brown 2.5y 3/2
1000	25		60 %			CL	SANDY clay, wet soft, 20% SAND iron staining olive brown, 2.5y 4/4

bottom of boring

TETRATECH EM INC

MONITORING WELL COMPLETION RECORD

DRILLING INFORMATION

RIG TYPE Geoprobe HSA
DRILLING BEGAN:
DATE 7/16/21 TIME 1000
BORING DIAMETER (in) 8
BORING DEPTH (ft) 18
WELL INSTALLATION BEGAN:
DATE 7/16/21 TIME 1000
WELL DEPTH (ft) 18
WELL COMPLETION FINISHED:
DATE 7/16/21 TIME 1200

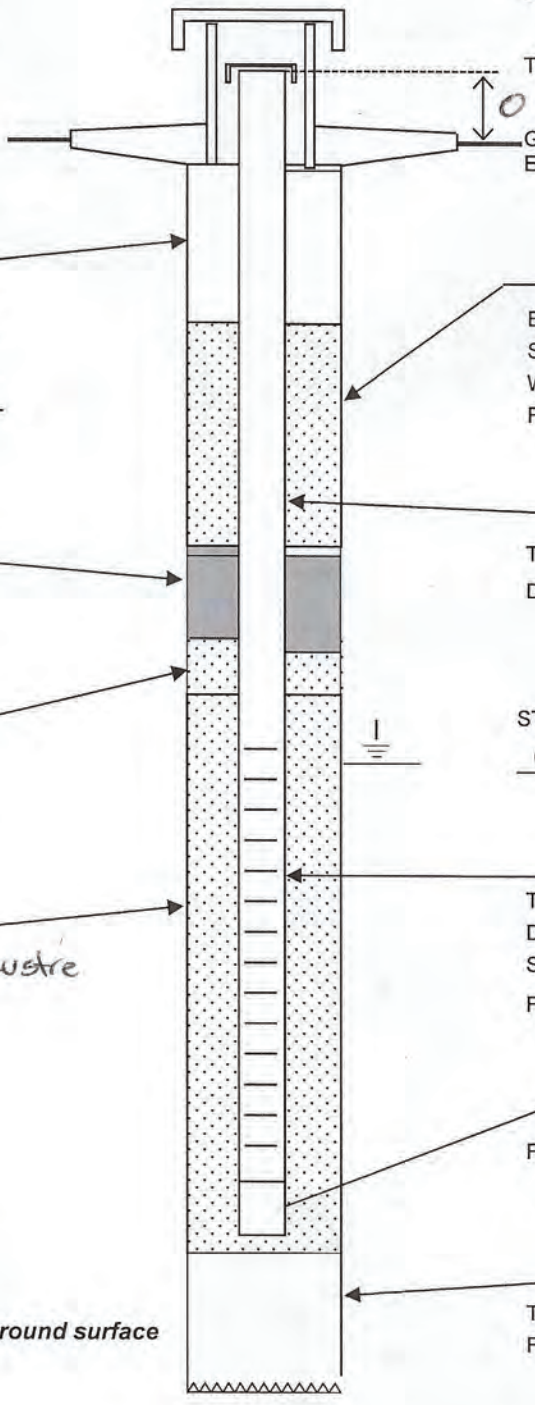
SURFACE COMPLETION

~~ABOVE GROUND W/ CRASH POSTS~~
Flush mounted

MONITORING WELL

MONITORING WELL ID C
PROJECT PFAS Site
SITE NASA AMES Moffett
BOREHOLE ID C

TOP OF CASING (ft) UNKNOWN
0
GROUND SURFACE ELEVATION (ft) UNKNOWN



ANNULAR SEAL

PORTLAND CEMENT (lbs) 60
~~BENTONITE~~ (lbs) SAND 110
WATER (gal) 4
FROM (ft) 0 TO (ft) 6

BENTONITE/SAND SLURRY

BENTONITE (lbs)
SAND (lbs)
WATER (gal)
FROM (ft) TO (ft)

CASING

TYPE 2" Sch. 40 PVC
DIAMETER (in) 2"

BENTONITE SEAL

TYPE Pure Gold Chips
BENTONITE (lbs)
WATER (gal)
FROM (ft) 6 TO (ft) 7

FINE SAND

SAND SIZE
SAND (lbs)
FROM (ft) TO (ft)

STATIC WATER LEVEL (ft)
UNKNOWN

WELL SCREEN

TYPE 2" Sch. 40 PVC
DIAMETER (in) 2
SLOT SIZE (in) .010
FROM (ft) 8 TO (ft) 18

FILTER PACK

SAND SIZE 2/12 Cemex Lapis Lustre
SAND (lbs) 310
FROM (ft) 7 TO (ft) 18

SUMP

FROM (ft) TO (ft)

CENTRALIZERS

INTERVALS

BOREHOLE BACKFILL

TYPE bentonite /water
FROM (ft) 18 TO (ft) 25

All measurements are in feet below ground surface except for well casing stickup

Notes

C:\Users\lgn-sfomv-fd\Downloads\MW Completion Record (1).doc

TETRA TECH

SOIL BORING CLASSIFICATION LOG

Site: NASA Ames Research Center, Moffett Field, CA

Project Name: PFAS Site Inspection

Boring Number: D	Date Started: 7/15/21
Drilling Method: (Circle one) Direct-Push / Hand Auger + AIR KNife	Date Completed: 7/15/21
	Logged By: VICTOR Early
Diameter of Boring: 8"	Drilling Subcontractor: Pene Core
Depth to Groundwater (if encountered) (feet bgs): 9	Driller: Jorge Ornelas
Depth to Native Material: UNKNOWN	Notes:

Time	Depth (feet bgs)	Drive Interval	Recovered Interval or % Interval Recovered	Sample ID	Well construction	classification	bare ground Description
1440			100%	AIR Knife		CL	silty CLAY, DRY, hard very dk grey 10yr 3/1
	5			HA		ML	sandy SILT, soft, 20% SAND, dry gray 7.5yr 6/1
			100%			SM	poorly graded silty sand, wet, 30% fines
	10					GM	med-dense, v. Fine brown 10YR 5/3 -gravel + SAND - silty wet, 20% fines, loose grayish brown 2.5y 5/2 up to 1/2" poorly graded
			80%			SM	poorly graded sand, silty, wet fine-m Fine 20% fines med-dense DK Grayish brown, 10yr 4/2
	15					CL	clay, soft, moist, 10% sand dark gray 10yr 4/1
			80%				-40% SAND-
1500	20						-20% SAND-
							bottom of boring

TETRATECH EM INC

MONITORING WELL COMPLETION RECORD

DRILLING INFORMATION

RIG TYPE Geoprobe HSA
DRILLING BEGAN:
DATE 7/15/21 TIME 1515
BORING DIAMETER (in) 8
BORING DEPTH (ft) 16-20
WELL INSTALLATION BEGAN:
DATE 7/15/21 TIME 1515
WELL DEPTH (ft) 16
WELL COMPLETION FINISHED:
DATE 7/16/21 TIME 1245

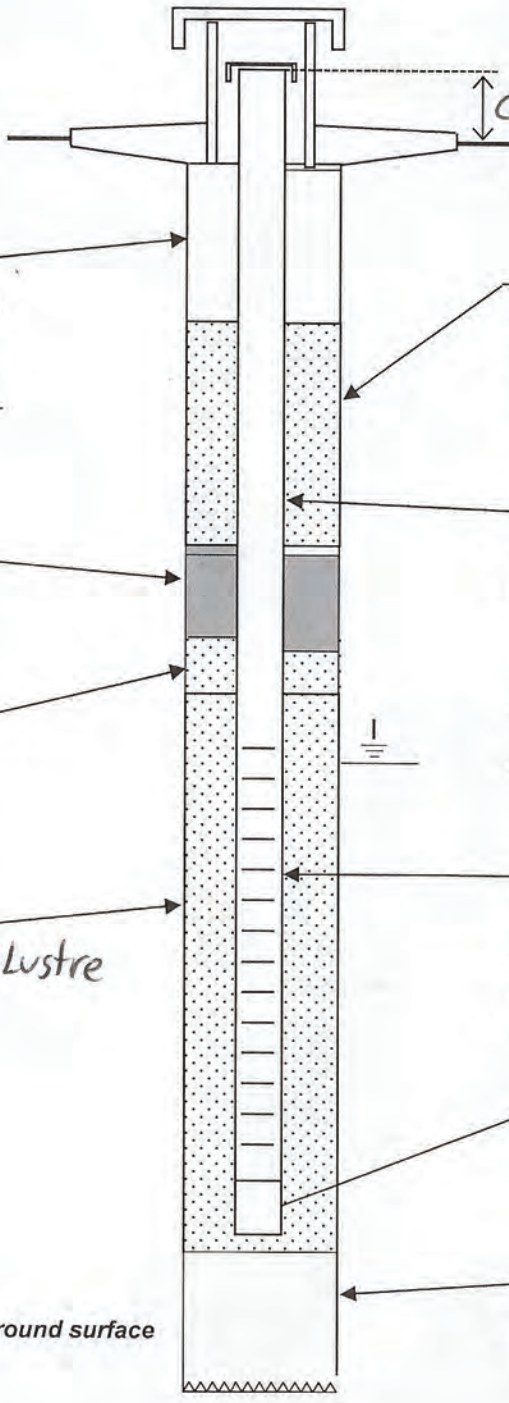
SURFACE COMPLETION

~~ABOVE GROUND W/ CRASH POSTS~~
Flush mounted

MONITORING WELL

MONITORING WELL ID D
PROJECT PFAS SITE
SITE NASA AMES Moffett
BOREHOLE ID D

TOP OF CASING (ft) UNKnown
GROUND SURFACE ELEVATION (ft) UNKnown



ANNULAR SEAL

PORTLAND CEMENT (lbs) 40
~~BENTONITE (lbs)~~ SAND 75
WATER (gal) 2.5
FROM (ft) 0 TO (ft) 4

BENTONITE/SAND SLURRY

BENTONITE (lbs)
SAND (lbs)
WATER (gal)
FROM (ft) TO (ft)

CASING

TYPE 2" sch 40 PVC
DIAMETER (in) 2"

BENTONITE SEAL

TYPE Pure Gold chips
BENTONITE (lbs) 40
WATER (gal) 3
FROM (ft) 4 TO (ft) 5

STATIC WATER LEVEL (ft)
9

FINE SAND

SAND SIZE
SAND (lbs)
FROM (ft) TO (ft)

WELL SCREEN

TYPE 2" sch 40 PVC
DIAMETER (in) 2
SLOT SIZE (in) .010
FROM (ft) 6 TO (ft) 16

FILTER PACK

SAND SIZE 2/12 Cemex LapisLustre
SAND (lbs) 320
FROM (ft) 5 TO (ft) 16

SUMP

FROM (ft) TO (ft)

CENTRALIZERS

INTERVALS

BOREHOLE BACKFILL

TYPE bentonite + water
FROM (ft) 16 TO (ft) 20

All measurements are in feet below ground surface except for well casing stickup

Notes

C:\Users\lgn-sfomv-fd\Downloads\MW Completion Record (1).doc

TETRA TECH

SOIL BORING CLASSIFICATION LOG

Site: NASA Ames Research Center, Moffett Field, CA

Project Name: PFAS Site Inspection

Boring Number: G	Date Started: 7/15/21
Drilling Method: (Circle one) Direct-Push / Hand Auger / AIR Knife	Date Completed: 7/15/21
	Logged By: VICTOR EARLY
Diameter of Boring: 8"	Drilling Subcontractor: Pene Core
Depth to Groundwater (if encountered) (feet bgs): 9.5'	Driller: Jorge Ornelas
Depth to Native Material: 2.5' est	Notes:

Time	Depth (feet bgs)	Drive Interval	Recovered Interval or % Interval Recovered		Sample ID well const	Classification	Description
							BARE GROUND.
915			100 %	AIR KNIFE		GM	Well graded silty gravel, angular up to 1.5 inches 30% fines & sand, dry, dense dk greyish brown 10yr 4/2
	5			HA		CL	silty clay / clayey silt stiff, dry, low plasticity v. dk brn to black 10yr 2/2 -moist-
					S		-grayish brown 10yr 5/2 - iron staining
	10						Poorly graded silty sand, 40% fines wet, v. fine med-dense, olive brown 2.5y 4/3 iron staining
			90 %			SM	
	15					CL	clay, silty, med-stiff, moist, 10% sand, med-plasticity Lt. olive brown 2.5y
			90 %			SM	Poorly graded silty sand, moist, v. fine, 40% fines olive brown, med-dense 2.5y
1030	20				18	CL SM	clay, silty soft, 10% sand, med plasticity moist, lt olive brn 5/3 poorly graded SAND, 20% fines, v. fine, wet, olive brown med. dense 2.5y 4/3
							Bottom of boring
	25						

TETRATECH EM INC

MONITORING WELL COMPLETION RECORD

DRILLING INFORMATION

RIG TYPE Geoprobe HSA
DRILLING BEGAN:
DATE 7/15/21 TIME 1040
BORING DIAMETER (in) 8
BORING DEPTH (ft) 20
WELL INSTALLATION BEGAN:
DATE 7/15/21 TIME 1040
WELL DEPTH (ft) 18
WELL COMPLETION FINISHED:
DATE 7/15/21 TIME 1245

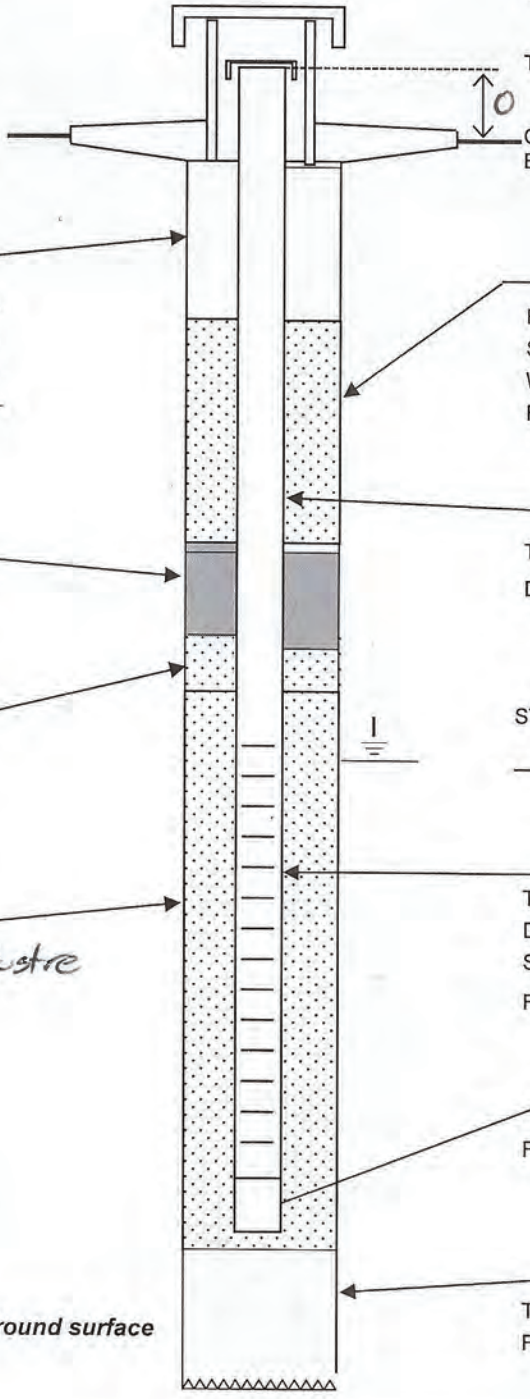
SURFACE COMPLETION

ABOVE GROUND W/ CRASH POSTS

MONITORING WELL

MONITORING WELL ID G
PROJECT PFAS SITE
SITE NASA AMES RC MOFFETT
BOREHOLE ID G

TOP OF CASING (ft) UNKNOWN
GROUND SURFACE ELEVATION (ft) UNKNOWN



ANNULAR SEAL

PORTLAND CEMENT (lbs) 75
~~BENTONITE~~ (lbs) SAND 150
WATER (gal) 7.5
FROM (ft) 6 TO (ft) 0

BENTONITE/SAND SLURRY

BENTONITE (lbs)
SAND (lbs)
WATER (gal)
FROM (ft) TO (ft)

CASING

TYPE 2" sch. 40 pvc
DIAMETER (in) 2

BENTONITE SEAL

TYPE Pure Gold chips
BENTONITE (lbs) 30
WATER (gal) 2.5
FROM (ft) 6 TO (ft) 7

STATIC WATER LEVEL (ft)
UNKNOWN

FINE SAND

SAND SIZE
SAND (lbs)
FROM (ft) TO (ft)

WELL SCREEN

TYPE 2" Sch 40 pvc
DIAMETER (in) 2
SLOT SIZE (in) .010
FROM (ft) 8 TO (ft) 18

FILTER PACK

SAND SIZE 2/12 Cemex Lapis Lustre
SAND (lbs) 325
FROM (ft) 7 TO (ft) 18

SUMP

FROM (ft) TO (ft)

CENTRALIZERS

INTERVALS

BOREHOLE BACKFILL

TYPE bentonite if WATER
FROM (ft) 19 TO (ft) 20

All measurements are in feet below ground surface except for well casing stickup

Notes

C:\Users\lgn-sfomv-fd\Downloads\MW Completion Record (1).doc

TETRA TECH

SOIL BORING CLASSIFICATION LOG

Site: NASA Ames Research Center, Moffett Field, CA

Project Name: PFAS Site Inspection

Boring Number: H	Date Started: 7/14/21
Drilling Method: (Circle one) Direct-Push / Hand Auger HA to 5'	Date Completed: 7/14/21
	Logged By: Victor Early
Diameter of Boring: 8"	Drilling Subcontractor: Pene Core
Depth to Groundwater (if encountered) (feet bgs): N/A	Driller: Jorge Ornelas
Depth to Native Material: 2 ft	Notes:

Bare Ground

Time	Depth (feet bgs)	Drive Interval	Recovered Interval or % Interval Recovered	Sample ID	Well Construction	Classification	Description
1350	0	X	100 %			GM	well graded silty Gravel angular up to 1" 40% fines + SAND, dry, dense greyish brown 10YR4/2
		X				ML CL	Silty Clay / Clayey silt STIFF, DRY, low plasticity DK yellowish brown, 10yr 4/4
	5	X				CL	clay, med stiff, moist, med-plasticity v. DK Brown to black 10yR 2/2
			80 %				-SOFT- some organic material + trace gravel
	10				10		-STIFF- olive gray 5Y 5/1
			100 %			SP SM	Poorly graded silty SAND/sandy silt, wet v. FINE SAND, 40-60% fines olive 5Y 5/4
	15						
			90 %			CL	clay, silty, med-STIFF, dry to moist 20% sand. med. plasticity olive brown 2.5Y 5/4 IRON staining
	20				20		-STIFF- bottom of boring
1600	25		100 %				

TETRATECH EM INC

MONITORING WELL COMPLETION RECORD

DRILLING INFORMATION

RIG TYPE Geoprobe H5A
DRILLING BEGAN:
DATE 7/14/21 TIME 1600
BORING DIAMETER (in) 8"
BORING DEPTH (ft) 20 (8") 25 (2")
WELL INSTALLATION BEGAN:
DATE 7/14/21 TIME 1600
WELL DEPTH (ft) 20
WELL COMPLETION FINISHED:
DATE 7/15/21 TIME 1415

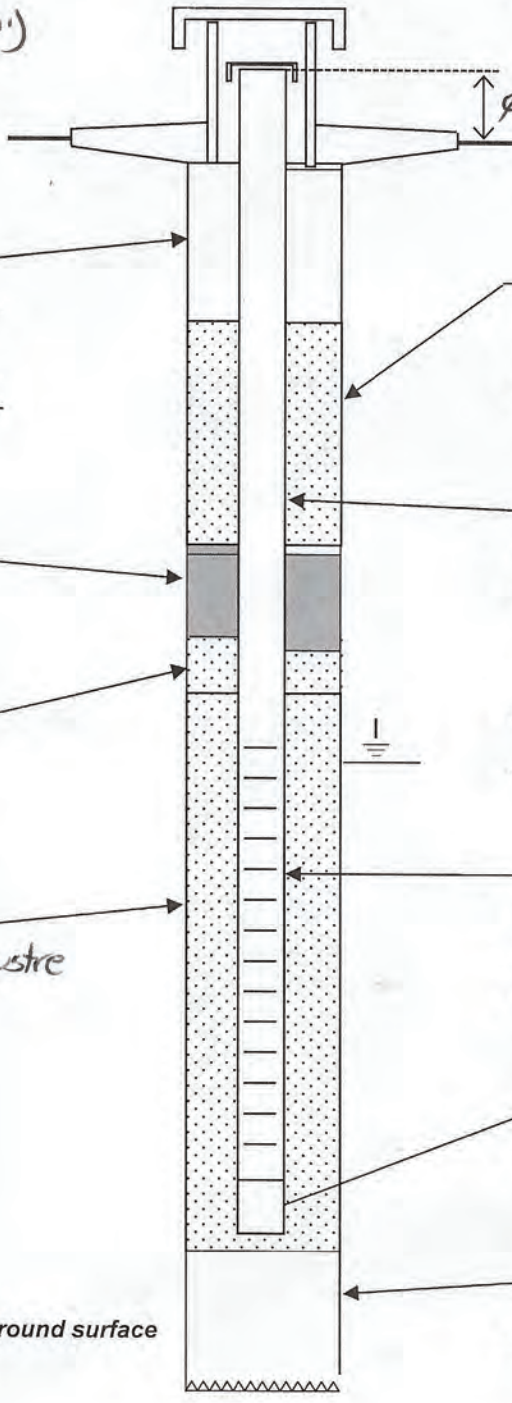
SURFACE COMPLETION

~~ABOVE GROUND W/ CRASH POSTS~~
FLUSH MOUNTED

MONITORING WELL

MONITORING WELL ID H
PROJECT PFAS SITE
SITE NASA AMES RC Moffett
BOREHOLE ID H

TOP OF CASING (ft) UNKNOWN
GROUND SURFACE ELEVATION (ft) UNKNOWN



ANNULAR SEAL

PORTLAND CEMENT (lbs) 75
~~BENTONITE (lbs)~~ SAND 150
WATER (gal) 4
FROM (ft) 0 TO (ft) 7.5

BENTONITE/SAND SLURRY

BENTONITE (lbs)
SAND (lbs)
WATER (gal)
FROM (ft) TO (ft)

CASING

TYPE 2" PVC Sch 40
DIAMETER (in) 2

BENTONITE SEAL

TYPE Pure Gold Chips
BENTONITE (lbs) 30
WATER (gal) 2.5
FROM (ft) 7.5 TO (ft) 9

STATIC WATER LEVEL (ft)

FINE SAND

SAND SIZE
SAND (lbs)
FROM (ft) TO (ft)

WELL SCREEN

TYPE 2" PVC Sch 40
DIAMETER (in) 2
SLOT SIZE (in) .010
FROM (ft) 10 TO (ft) 20

FILTER PACK

SAND SIZE 2/12 Cemex Lapis Lustre
SAND (lbs) 330
FROM (ft) 9 TO (ft) 20

SUMP

FROM (ft) TO (ft)

CENTRALIZERS

INTERVALS

BOREHOLE BACKFILL

TYPE bentonite + water
FROM (ft) 20 TO (ft) 25

All measurements are in feet below ground surface except for well casing stickup

Notes

C:\Users\lgn-sfomv-fd\Downloads\MW Completion Record (1).doc

TETRA TECH

SOIL BORING CLASSIFICATION LOG

Site: NASA Ames Research Center, Moffett Field, CA

Project Name: PFAS Site Inspection

Boring Number: PFAS-E	Date Started: 7-15-21
Drilling Method: (Circle one) Direct-Push / Hand Auger (first 6ft)	Date Completed: 7-15-21
	Logged By: Jessica Robinson
Diameter of Boring: 1in	Drilling Subcontractor: PeneCore
Depth to Groundwater (if encountered) (feet bgs): 14 ft	Driller: Willy
Depth to Native Material:	Notes:

Time	Depth (feet bgs)	Drive Interval	Recovered Interval or % Interval Recovered	Sample ID	Description
	1, 2, 3, 4, 6, 8, 10, 12, 14, 16	0-6; 6-10; 10-14; 14-17.5		GW	0-6' clayey silt (ML/CL), very dark gray (5Y 3/1), dry 6'-10' clay (CH), olive gray (5Y 4/2), high plastic, wet 10'-11' clay (CL), dark reddish brown (5YR 3/4), low plastic, 11'-14' Same, 2% subangular gravel, .5-.75" 14'-17.5' Gravelly sand (SW), dark grayish brown (2.5Y 4/2), very fine to coarse sand; 25% subangular gravel; 0.5-1", 5% silt, saturated

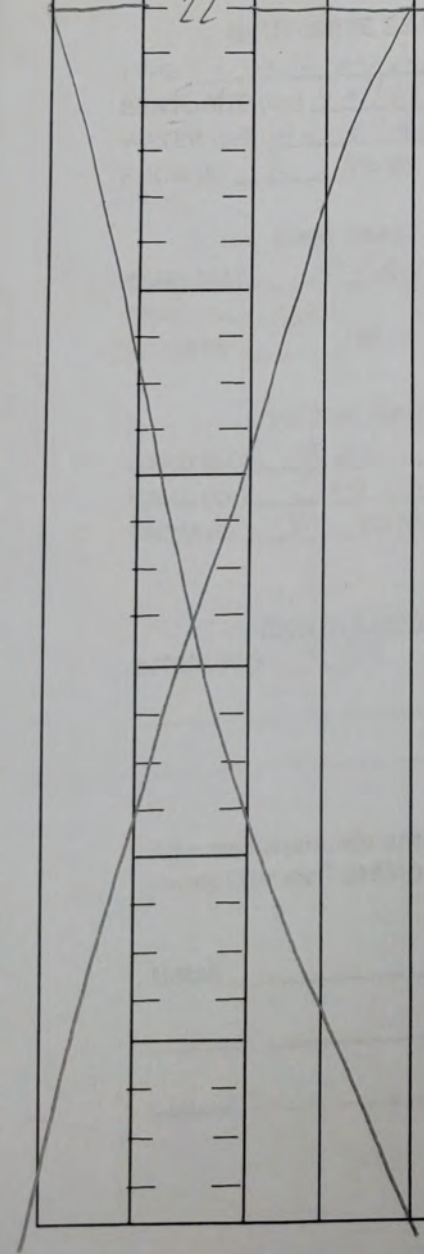
TETRA TECH

SOIL BORING CLASSIFICATION LOG

Site: NASA Ames Research Center, Moffett Field

Project Name: PFAS Site Inspection

Time	Depth (feet bgs)	Drive Interval	Recovered Interval or % Interval Recovered	Sample ID	Description
	16	14			14'-17.5' Gravelly Sand (SW)
	17	17.5			17.5-19' Silty sand (SP), light brownish gray (2.5Y 6/2), 20% silt, compact, wet
	18	17.5			
	19	19			19'-20' Sandy clay (CL), gray (5Y 5/1), low plastic, compacted, 20% sand, very fine; 1" lens of fine-coarse sand
	20	19-20			
		20-21			20'-21' Sand (SP) dark gray (5Y 4/1), poorly graded fine sand-se
		21-22		SW	1" clayey sand at base, 25% clay
	22				21'-22' Gravelly Sand (SW), dark gray (5Y 4/1), fine-coarse, 25% subangular gravel, 0.5-.75", <5% silt, saturated



TETRATECH EM INC

MONITORING WELL COMPLETION RECORD

DRILLING INFORMATION

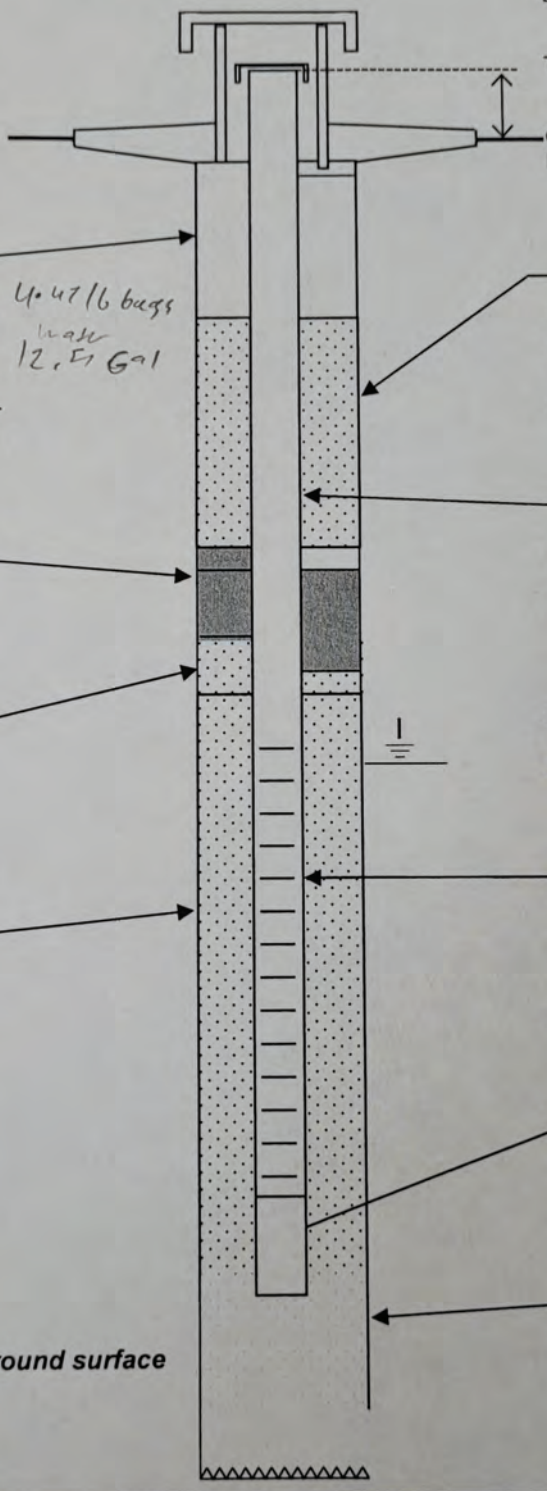
RIG TYPE Geoprobe, Combo DPT/Rotary
DRILLING BEGAN:
DATE 7-15-21 TIME 1310
BORING DIAMETER (in) 4 in
BORING DEPTH (ft) 22
WELL INSTALLATION BEGAN:
DATE 7-15-21 TIME 1405
WELL DEPTH (ft) 20
WELL COMPLETION FINISHED:
DATE 7-15-21 TIME 1632

SURFACE COMPLETION

~~ABOVE GROUND W/ CRASH POSTS~~
Flush Mount

MONITORING WELL

MONITORING WELL ID PFAS-E
PROJECT Nasa Ames
SITE Sunnyvale Golf Course
BOREHOLE ID PFAS-E



TOP OF CASING (ft) 0
GROUND SURFACE ELEVATION (ft)

ANNULAR SEAL

PORTLAND CEMENT (lbs) 188 (4.47/6 bags)
BENTONITE (lbs) N/A
WATER (gal) 12.5 (mash 12.5 Gal)
FROM (ft) 0 TO (ft) 9

BENTONITE/SAND SLURRY

BENTONITE (lbs)
SAND (lbs)
WATER (gal)
FROM (ft) TO (ft)

CASING

TYPE 40 PVC
DIAMETER (in) 2

BENTONITE SEAL

TYPE Puregold medium chips
BENTONITE (lbs) 50/65
WATER (gal) none added
FROM (ft) 8 TO (ft) 9

STATIC WATER LEVEL (ft) 14 Ft

FINE SAND

SAND SIZE N/A
SAND (lbs)
FROM (ft) TO (ft) 9

WELL SCREEN

TYPE
DIAMETER (in)
SLOT SIZE (in) 0.01
FROM (ft) 10 TO (ft) 20

FILTER PACK

SAND SIZE #2/12
SAND (lbs) 250 lbs
FROM (ft) 9 TO (ft) 20

SUMP

FROM (ft) N/A TO (ft)

CENTRALIZERS

INTERVALS N/A

BOREHOLE BACKFILL

TYPE N/A, collaspe 20-22
FROM (ft) TO (ft)

All measurements are in feet below ground surface except for well casing stickup

Notes

C:\Users\CALLIE.NEAVES\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\7SMAWQYI\MW Completion Record.doc

TETRA TECH

SOIL BORING CLASSIFICATION LOG

Site: NASA Ames Research Center, Moffett Field, CA

Project Name: PFAS Site Inspection

Boring Number: PFAS-F	Date Started: 7-15-21
Drilling Method: (Circle one) Direct-Push / Hand Auger Hand Auge- first 6ft	Date Completed: 7-15-21
	Logged By: Jessica Robinson
Diameter of Boring: 2 in	Drilling Subcontractor: PeneCore
Depth to Groundwater (if encountered) (feet bgs): 16.5ft	Driller: Willy
Depth to Native Material:	Notes:

Time	Depth (feet bgs)	Drive Interval	Recovered Interval or % Interval Recovered	Sample ID	Description
0831	1 2 3 4 8 12 16	0-0.5 0.5 - 4 4-5 5-6 6 - 9.5 9.5 - 16.5			0-0.5' soil 0.5-4' clayey silt (ML/CL); very dark gray (5Y 3/1), dry. 4-5' Lean clay (CL); dark gray, dry, low plastic 5'-6' Lean clay with sand (CL); pale yellow (5Y 7/3) very fine sand (15%), dry, low plastic 6'-9.5' Same, very fine sand increases to 25% 9.5'-12' Clayey Sand (SC); Pale yellow (5Y 7/3); 70% sand very fine - fine sand; 10% silt; 15% clay; 5% subangular gravel, 7.5"; soft, moist 12'-16.5' Same, clay increases to 20%, hard

TETRA TECH

SOIL BORING CLASSIFICATION LOG

Site: NASA Ames Research Center, Moffett Field

Project Name: PFAS Site Inspection

Time	Depth (feet bgs)	Drive Interval	Recovered Interval or % Interval Recovered	Sample ID	Description
	16				
	17	16.5-17		GW	16.5-17' Poorly graded Sand with Silt (SP-SM); olive (5Y 5/3); 90% very fine - fine sand; 10% silt; <1% subangular gravel, <.5"; saturated
	18	17			17'-20' Clay (CH); olive gray (5Y 4/2); hard, high plastic
	19	20			
	20			GW	20-21.5' Sand with Silt (SP-SM); olive (5Y 4/3) 85% very fine - fine sand, 10% silt, 5% subangular gravel, <.5"; some pieces of clay, <.5"; saturated
		20 21.5			
	21.5				21.5-25' Sandy Clay (CL) black (5Y 2.5/2); 20% very fine sand, soft, moist
	24				
	25	25-25.5		GW	25-25.5' Sand (SW) black (5Y 2.5/2); very fine - coarse, 5% gravel, subangular, <0.5"; 5% silt; saturated
	25.5				25.5-26' Sandy Clay (CL) black (5Y 2.5/2); 20% very fine sand, soft, moist
	26				

nd
orting

TETRATECH EM INC

MONITORING WELL COMPLETION RECORD

DRILLING INFORMATION

RIG TYPE Direct push
DRILLING BEGAN:
DATE 7-14-21 TIME 0840
BORING DIAMETER (in) 4 in
BORING DEPTH (ft) 26
WELL INSTALLATION BEGAN:
DATE 7-14-21 TIME 1020
WELL DEPTH (ft) 25
WELL COMPLETION FINISHED:
DATE 7-15-21 TIME 1613

SURFACE COMPLETION

~~ABOVE GROUND W/ CRASH POSTS~~
Flush Mount

MONITORING WELL

MONITORING WELL ID ~~E~~ PFAS-F
PROJECT NASA Ames
SITE Sunnyvale Golf Course
BOREHOLE ID PFAS-F

TOP OF CASING (ft) 0
GROUND SURFACE ELEVATION (ft) _____

ANNULAR SEAL

PORTLAND CEMENT (lbs) 188
BENTONITE (lbs) N/A
WATER (gal) 12.5
FROM (ft) 0 TO (ft) 13

BENTONITE/SAND SLURRY

BENTONITE (lbs) N/A
SAND (lbs) _____
WATER (gal) _____
FROM (ft) _____ TO (ft) _____

CASING

TYPE 40 PVC
DIAMETER (in) 2

BENTONITE SEAL

TYPE Pure gold medium chips
BENTONITE (lbs) 50 lbs
WATER (gal) none added
FROM (ft) 13 TO (ft) 14

STATIC WATER LEVEL (ft)

16.5 ft

FINE SAND

SAND SIZE N/A
SAND (lbs) _____
FROM (ft) 14 TO (ft) 15

WELL SCREEN

TYPE _____
DIAMETER (in) _____
SLOT SIZE (in) 0.01
FROM (ft) 15 TO (ft) 25

FILTER PACK

SAND SIZE 2/12
SAND (lbs) 250 lbs
FROM (ft) 14 TO (ft) 25

SUMP

FROM (ft) N/A TO (ft) _____

CENTRALIZERS

INTERVALS N/A

BOREHOLE BACKFILL

TYPE N/A
FROM (ft) _____ TO (ft) _____

All measurements are in feet below ground surface except for well casing stickup

Notes _____

C:\Users\CALLIE.NEAVES\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\7SMAWQYT\MW Completion Record.doc

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/7/21 / 1057 Project Site/Subsite: NASA AMES / AOPC10

Well ID: ~~AO~~ WGC2-6 Sample ID: AOPC10 - WGC2-6 - 070721

Depth to Water Level: 2.91 ft below top of casing prior to sampling, 3.14 after sampling

Depth to Well Bottom: 23.26 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.090 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (~~S/m~~) mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1033	20.4	6.79	-139.9	25.81	35.9	3.84			0.09
2	1040	20.4	6.95	-181.0	26.331	36.1	1.90	13.36	16.21	0.72
3	1043	20.3	6.99	-188.3	26.526	37.1	1.25	13.47	16.32	0.99
4	1046	20.4	7.07	-202.7	27.063	29.2	1.15	13.75	16.70	1.26
5	1049	20.4	7.13	-208.1	27.509	38.5	1.09	13.95	16.97	1.53
6	1052	20.3	7.21	-218.6	27.985	37.1	1.03	14.26	17.42	1.80
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Light sediment, yellow/brown color

Lock Conditions Well casing damaged, cement housing cracked, rubber seal unable to seal

Comments _____

Sample(s) Collected By: Mike Dahlquist

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/7/21, 1203 Project Site/Subsite: NASA AMES / AOPC 10

Well ID: WGC2-12 Sample ID: AOPC10-WGC2-12-070721

Depth to Water Level: 3.34 ft below top of casing prior to sampling, 3.40 after sampling

Depth to Well Bottom: 20.25 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged ~~0.075~~ 2.425 MSD Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.09 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1137	22.2	7.01	5.6	34.388	103.0	2.98	27.45	26.36	.25
2	1142	21.0	6.70	-26.3	46.712	135.6	3.54	30.39	30.50	0.625
3	1147	20.8	6.67	-47.1	47.267	181.9	3.14	30.72	30.82	1.075
4	1152	20.8	6.66	-59.0	47443	168.0	2.88	30.81	30.91	1.525
5	1157	20.7	6.72	-70.5	47.408	161.0	2.68	30.81	30.90	1.975
6	1202	20.7	6.66	-77.1	47.424	169.0	2.66	30.83	30.92	2.425
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? No (Yes) (Sample ID of Duplicate) AOPC10-WGC2-12-070721

MS/MSD Sample Collected? (No) Yes

Sample Remarks (odors, colors, sediment): no odor, clear color, no sediment

Lock Conditions OK

Comments

Sample(s) Collected By: E. McDonald

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/7/21 / 1308 Project Site/Subsite: NAVA AMES / AOPC 10

Well ID: WGC2-4 Sample ID: AOPC10-WGC2-4-070721

Depth to Water Level: 1.80 ft below top of casing prior to sampling, 2.56 after sampling

Depth to Well Bottom: 19.82 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.125 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1238	20.3	17.37	-313.8	6.300	8.0	0.75	3.14	3.39	1
2	1243	20.0	17.38	-322.6	6.347	6.7	0.54	3.22	3.48	1.6
3	1248	19.8	17.39	-331.0	6.370	5.2	0.47	3.23	3.48	2.2
4	1253	19.6	17.40	-349.5	6.261	2.8	0.44	3.17	3.42	2.8
5	1258	19.6	17.40	-357.9	5.971	3.1	0.39	3.03	3.26	3.4
6	1303	19.5	17.40	-363.4	5.918	1.8	0.38	2.99	3.22	4.0
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Heavy, dark sediment; brown,

Lock Conditions Well casing rusted, but intact;

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/7 / 1340 Project Site/Subsite: NASA Ames

Well ID: WGC2-5 Sample ID: AOPC10-WGC2-5-070721

Depth to Water Level: 2.29 ft below top of casing prior to sampling, 3.73 after sampling

Depth to Well Bottom: 21.62 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch 4 inch

Total Purged 4.96 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.08 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1412	21.0	7.00	-93.4	56.900	7.9	1.16	37.03	37.99	0.16
2	1417	20.9	7.00	-105.4	57.402	7.2	0.97	37.38	38.36	0.56
3	1422	20.8	7.00	-118.1	57.598	7.2	0.87	37.43	38.44	0.96
4	1427	21.0	7.00	-122.4	57.475	6.3	0.79	37.40	38.38	1.36
5	1432	20.9	7.00	-121.2	57.520	16.0	0.76	37.37	38.39	1.76
6	1437	20.8	7.00	-118.1	57.416	22.0	0.86	37.30	38.33	2.16
7	1442	20.8	7.00	-115.5	57.340	21.7	0.84	37.28	38.27	2.56
8	1447	20.8	7.00	-113.3	57.345	22.7	0.78	37.23	38.21	2.96
9	1452	20.8	7.00	-112.0	57.267	23.3	0.76	37.23	38.22	3.36
10	1457	20.8	7.00	-110.5	57.272	22.8	0.70	37.22	38.21	3.76
11	1502	20.7	7.00	-107.8	57.213	23.7	0.66	37.18	38.15	4.16
12	1507	20.6	7.00	-107.3	57.097	23.3	0.61	37.13	38.10	4.56
13	1512	20.6	7.00	-106.2	57.100	22.6	0.60	37.10	38.06	4.96
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: _____

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/7/21 / 1445 Project Site/Subsite: NASA AMES

Well ID: ~~RW-2662-4~~ W3-20 Sample ID: AOPC10 - W3-20 - 070721

Depth to Water Level: 4.98 ft below top of casing prior to sampling, _____ after sampling

Depth to Well Bottom: 21.77 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.105 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1415	20.16	17.36	25.9	0.961	4.1	3.16	0.49	0.47	0.63
2	1420	19.9	17.38	16.8	0.951	1.2	1.48	0.48	0.47	1.155
3	1425	19.9	17.38	13.5	0.949	0.6	1.28	0.48	0.47	1.68
4	1430	19.9	17.39	11.4	0.947	2.5	1.25	0.48	0.47	2.205
5	1435	19.9	17.39	9.2	0.947	3.1	1.06	0.48	0.47	2.73
6	1440	19.8	17.39	8.1	0.945	4.8	1.20	0.48	0.47	3.255
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear, low sediment

Lock Conditions Heavy soil/dirt deposits on well casing cap

Comments _____

Sample(s) Collected By: Mike Dahlquist

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/7/21 / 16:55 Project Site/Subsite: NASA AMES / AOPC17

Well ID: W3-1 Sample ID: AOPC17-W3-1-070721

Depth to Water Level: 5.30 ft below top of casing prior to sampling, 5.31 after sampling

Depth to Well Bottom: 19.56 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)	
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--		
1	15:45	22.1	8.00	46.0	1.103	54.4	4.91	0.72	0.54	~~0.3~~	0.3
2	15:50	21.5	7.84	40.6	1.038	58.1	~~5.5~~ 4.50	0.68	0.51	0.4	0.8
3	15:55	21.3	7.78	36.4	1.031	56.4	4.10	0.67	0.51	0.5	1.3
4	16:00	21.3	7.76	27.2	1.029	55.5	3.92	0.67	0.51	0.6	1.8
5	16:05	21.1	7.69	26.8	1.027	53.1	3.54	0.67	0.51	0.7	2.3
6	16:10	21.1	7.69	26.7	1.026	51.2	3.57	0.67	0.51	0.8	2.8
7	16:15	21.0	7.70	23.8	1.027	64.1	3.58	0.67	0.51	0.9	3.3
8	16:20	21.1	7.68	25.0	1.028	62.9	3.44	0.67	0.51	1.0	3.8
9	16:24	21.0	7.66	23.7	1.025	3.7	3.28	0.67	0.51	1.1	4.2
10	16:28	20.8	7.66	22.4	1.025	5.5	3.05	0.67	0.51	1.2	4.6
11	16:32	20.9	7.65	22.0	1.024	5.4	3.02	0.67	0.51	1.3	5.0
12	16:36	20.7	7.65	17.5	1.024	10.2	2.98	0.67	0.51	1.4	5.4
13	16:40	20.7	7.64	16.8	1.024	12.0	2.84	0.67	0.51	1.5	5.8
14	16:44	20.7	7.64	15.9	1.024	12.0	2.78	0.67	0.51	1.6	6.2
15	16:48	20.7	7.65	11.6	1.025	13.0	2.74	0.66	0.51	MSD 7/7/21	6.6
16											
17											
18											
19											
20											

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): no odor, clear color, no sediment

Lock Conditions OK, casing cap rusted and not screwed in

Comments _____

Sample(s) Collected By: E. McDonald

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/8/21 / 1035 Project Site/Subsite: NASA AMES / AOPC 17

Well ID: W3-8 Sample ID: AOPC17-W3-8-070821

Depth to Water Level: 4.18' ft below top of casing prior to sampling, 4.20 after sampling

Depth to Well Bottom: 14.10 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 6.8 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.15 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	0955	19.7	17.40	65.3	2.209	43.9	3.44	1.12	1.14	1.05
2	1000	19.4	17.40	69.5	2.205	58.6	3.04	1.12	1.13	1.8
3	1005	19.3	17.41	73 8	2.201	40.2	2.82	1.12	1.13	2.55
4	1010	19.4	17.40	76.8	2.206	39.5	3.09	1.12	1.13	3.3
5	1015	19.4	17.40	81.4	2.203	19.0	2.74	1.12	1.13	4.05
6	1020	19.3	17.41	82.2	2.205	5.8	2.54	1.12	1.13	4.8
7	1025	19.3	17.41	82.7	2.202	4.8	2.56	1.12	1.13	5.55
8	1030	19.2	17.41	83.3	2.205	3.8	2.46	1.12	1.13	6.3
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Turbidity fluctuated heavily; grey sediment color

Lock Conditions Cap intact, seal intact

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/8/21 / 1300 Project Site/Subsite: NASA AMES / AOPC 9,16

Well ID: W2-16 Sample ID: AOPC 9,16 - W2-16 - 070821

Depth to Water Level: 3.75 ft below top of casing prior to sampling, 3.78 after sampling

Depth to Well Bottom: 17.76 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 8.2 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.120 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1155	22.6	17.29	-149.9	14.498	310.1	6.05	7.54	8.74	0.5
2	1200	22.1	17.31	-152.4	15.764	262.8	5.56	8.13	9.43	1.1
3	1205	21.4	17.33	-151.2	17.617	239.5	4.96	8.96	10.47	1.7
4	1210	21.4	17.33	-149.8	18.249	213.8	4.56	9.31	10.90	2.3
5	1215	21.2	17.34	-147.1	18.918	110.8	4.20	9.61	11.29	2.9
6	1220	21.1	17.34	-145.8	18.931	208.4	3.77	9.64	11.34	3.5
7	1225	21.3	17.34	-141.6	19.913	282.1	3.48	10.09	11.91	4.1
8	1230	21.6	17.32	-137.8	20.123	233.6	3.18	10.20	12.01	4.7
9	1235	21.2	17.34	-134.8	19.964	205.8	2.94	10.13	11.94	5.3
10	1240	21.4	17.33	-128.6	20.450	178.3	2.96	10.37	12.25	5.9
11	1245	21.6	17.33	-124.4	20.402	167.9	2.69	10.33	12.19	6.5
12	1250	21.5	17.33	-119.4	20.419	1103.6	2.75	10.37	12.26	7.1
13	1255	21.6	17.33	-116.7	20.555	1516.2	2.62	10.41	12.30	7.7
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Very turbid water: grey clay sediment.

Lock Conditions Seal intact, well cap damaged on one flush bolt

Comments Turbidity fluctuated greatly. Unable to fully stabilize turbidity

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/8/21 / 1345 Project Site/Subsite: NASA AMES / AOPC 16

Well ID: WU5-9 Sample ID: AOPC16-RM WU5-9-070821

Depth to Water Level: 1.51 ft below top of casing prior to sampling, 1.55 after sampling

Depth to Well Bottom: 19.90 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 5.55 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.04 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1257	30.6	6.69	-259.2	38 050	86.7	1.14	24.75	24.08	4.15
2	1302	30.6	6.69	-258.1	38.300	87.5	1.13	24.96	24.26	4.35
3	1307	31.0	6.74	-212.9	39.838	94.1	1.11	25.92	25.28	4.55
4	1312	30.7	6.70	-243.3	40.407	95.5	1.12	26.26	25.67	4.75
5	1317	30.6	6.70	-247.7	40.640	100.3	1.12	26.43	25.86	4.95
6	1322	30.5	6.70	-241.5	40.778	102.2	1.12	26.53	25.97	5.15
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? No Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? No Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Mike Dahlquist

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/8/21 , 1345 Project Site/Subsite: NASA Ames / AOPC 16

Well ID: WU5-9 Sample ID: AOPC16-WU5-9-070821

Depth to Water Level: 1.51 ft below top of casing prior to sampling, ~~14.90~~ 1.55 after sampling

Depth to Well Bottom: 19.90 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 5.55 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate ~~0.1~~ 0.04 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m) mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1117	24.9	7.57	-200.6	2.515	49.8	2.52	1.63	1.29	0.15
2	1122	27.0	7.45	-239.2	2.523	14.4	2.04	1.64	1.30	0.35
3	1127	27.7	7.38	-247.6	2.598	18.5	1.74	1.69	1.34	0.55
4	1132	28.3	7.32	-261.2	2.938	16.0	1.61	1.93	1.53	0.75
5	1137	28.3	7.26	-263.2	3.586	16.2	1.51	2.34	1.89	0.95
6	1142	28.5	7.21	-235.5	4.580	19.3	1.43	3.01	2.46	1.15
7	1147	28.5	7.19	-261.9	4.855	20.6	1.42	3.18	2.61	1.35
8	1152	28.5	7.15	-266.9	5.789	23.7	1.39	3.14	3.16	1.55
9	1157	28.7	7.08	-266.3	7.545	30.2	1.36	5.10	4.33	1.75
10	1202	28.9	7.09	-253.9	9.247	35.9	1.33	6.10	5.25	1.95
11	1207	29.1	7.00	-266.3	11.919	38.2	1.31	7.77	6.81	2.15
12	1212	29.2	6.92	-272.4	13.999	40.5	1.29	9.20	8.19	2.35
13	1217	29.2	6.89	-274.1	16.500	42.2	1.28	10.71	9.65	2.55
14	1222	29.1	6.83	-275.7	20.092	49.8	1.26	13.23	12.20	2.75
15	1227	29.2	6.80	-274.3	23.115	52.2	1.25	15.23	14.16	2.95
16	1232	29.4	6.77	-272.7	25.420	55.6	1.23	16.81	15.82	3.15
17	1237	29.5	6.73	-265.6	29.671	66.7	1.21	19.36	18.45	3.35
18	1242	29.8	6.71	-258.5	32.111	67.6	1.19	20.89	20.16	3.55
19	1247	30.1	6.71	-262.2	34.590	71.9	1.17	22.54	21.84	3.75
20	1252	30.4	6.70	-261.8	37.916	85.5	1.14	24.30	23.57	3.95

Duplicate Sample Collected? No Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? No Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Mike Dahlquist

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/8/21 , 1510 Project Site/Subsite: NASA AMES / AOPC 26

Well ID: WS-3 Sample ID: AOPC 26-WS-3-070821

Depth to Water Level: 6.86 ft below top of casing prior to sampling, 6.86 after sampling

Depth to Well Bottom: 30.30 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 4.2 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1431	23.9	7.00	47.5	1.127	1044.0	6.65	0.72	0.55	0.20
2	1435	25.7	7.00	86.8	1.050	846.8	6.12	0.68	0.51	~~0.6~~
3	1439	25.7	7.00	97.1	0.988	954.2	5.81	0.64	0.48	1.40
4	1443	26.0	7.00	101.9	1.032	454.2	6.62	0.66	0.50	1.80
5	1447	25.2	7.00	107.6	0.939	445.0	6.22	0.61	0.46	2.2
6	1451	25.9	7.00	108.4	0.916	546.6	8.48	0.59	0.45	2.6
7	1455	26.5	7.00	112.9	0.905	469.7	8.41	0.59	0.44	3.0
8 1459	~~1459~~	26.5	7.00	117.1	0.897	305.0	7.88	0.58	0.44	3.4
9 1503	~~1455~~	26.4	7.00	117.9	0.893	307.1	7.71	0.58	0.44	3.8
10	1506	26.3	7.00	119.4	0.890	312.0	7.49	0.58	0.43	4.2
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): no odor, yellow color, a lot of sediment

Lock Conditions rusted, cap not tight

Comments _____

Sample(s) Collected By: E. McDonald

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/9/21 / 1307 Project Site/Subsite: NASA AMES / AOPC 8

Well ID: W1-20 Sample ID: AOPC8-W1-20-070921

Depth to Water Level: 4.35 ft below top of casing prior to sampling, 5.24 after sampling

Depth to Well Bottom: 21.85 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 7.65 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.15 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1227	19.2	7.46	53.4	54.635	32.6	2.01	35.52	36.22	0.9
2	1232	18.8	7.20	13.8	54.551	12.6	1.78	35.46	36.18	1.65
3	1237	18.7	7.06	-14.7	54.528	7.0	1.70	35.50	36.22	2.4
4	1242	18.6	7.04	-22.4	54.507	7.8	1.68	35.48	36.17	3.15
5	1247	18.6	7.00	-28.2	54.513	5.2	1.67	35.41	36.12	3.9
6	1252	18.6	6.94	-33.8	54.540	4.7	1.66	35.47	36.18	4.65
7	1257	18.5	6.90	-37.4	54.527	4.9	1.64	35.45	36.16	5.4
8	1302	18.6	6.84	-38.4	54.555	5.1	1.62	35.49	36.22	6.15
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? No (Yes) _____

Sample Remarks (odors, colors, sediment): Clear; orange algae suspended in water column

Lock Conditions Well casing intact; housing intact; locked + required keys

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/9/21 1320 Project Site/Subsite: NASA ARC

Well ID: WI-1R Sample ID: AOPCS-WI-1R-070921

Depth to Water Level: 7.82 ft below top of casing prior to sampling, ~~27.5~~ 8.63 after sampling

Depth to Well Bottom: 27.45 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 5.6 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1220	27.2	6.89	77.5	47.271	299.4	2.61	30.71	30.68	0.1
2	1225	26.7	6.83	167.3	47.468	371.0	2.59	30.84	30.85	0.6
3	1230	26.6	6.84	177.8	47.489	444.0	1.96	30.88	30.86	1.1
4	1235	26.6	6.84	180.7	47.480	449.5	1.75	30.86	30.85	1.6
5	1240	26.6	6.85	178.6	47.504	508.9	1.52	30.86	30.88	2.1
6	1245	26.3	6.85	178.3	47.478	549.1	1.27	30.89	30.88	2.6
7	1250	26.3	6.85	176.1	47.545	568.7	1.16	30.87	30.88	3.1
8	1255	26.1	6.85	175.6	47.482	583.7	1.13	30.90	30.91	3.6
9	1300	26.2	6.85	175.4	47.512	579.8	1.04	30.85	30.87	4.1
10	1305	25.7	6.85	174.8	47.536	583.9	0.99	30.86	30.87	4.6
11	1310	25.3	6.86	174.0	47.349	595.6	0.97	30.78	30.80	5.1
12	1315	25.0	6.86	173.6	47.548	561.2	0.93	30.80	30.82	5.6
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Calie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/9/21, 1400 Project Site/Subsite: NASA Ames

Well ID: W1-19 Sample ID: AOC 8-W1-19-070921

Depth to Water Level: 5.11 ft below top of casing prior to sampling, 5.12 after sampling

Depth to Well Bottom: 21.16 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 4.35 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.15 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1330	20.5	7.15	94.4	54.758	242.3	4.39	35.49	36.28	0.15
2	1334	19.8	7.07	94.9	54.547	27.0	4.20	35.50	36.20	0.75
3	1338	19.4	7.08	83.5	54.454	39.0	3.44	35.38	36.08	1.35
4	1342	19.2	6.97	86.5	54.305	83.8	3.19	35.26	35.99	1.95
5	1346	19.0	6.96	86.1	54.390	72.1	3.08	35.29	35.98	2.55
6	1349	19.1	6.95	84.2	54.392	87.0	2.86	35.31	35.99	3.15
7	1352	18.9	6.94	79.7	54.333	87.3	2.80	35.33	36.01	3.75
8	1355	19.0	6.96	64.4	54.430	88.2	2.64	35.41	36.04	4.35
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? No (Yes) (Sample ID of Duplicate) AOC8-W1-19-070921-FD @1405

MS/MSD Sample Collected? (No) Yes

Sample Remarks (odors, colors, sediment): no odor, clear color, no sediment

Lock Conditions good

Comments

Sample(s) Collected By: E. McDonald

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/9/21 Project Site/Subsite: NASA ARC

Well ID: WL-5 Sample ID: AOPC8-WL-5-070921

Depth to Water Level: 5.24 ft below top of casing prior to sampling, 5.41 after sampling

Depth to Well Bottom: 21.35 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 3.7 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1440	24.5	7.08	-89.8	43.356	7.8	1.83	28.09	27.82	0.1
2	1444	23.8	7.08	-97.2	43.078	2.7	1.47	27.87	27.62	0.5
3	1448	22.6	7.07	-103.5	42.570	-0.9	1.05	27.64	27.35	0.9
4	1452	22.4	7.06	-106.6	42.329	-3.1	0.81	27.56	27.26	1.3
5	1456	22.2	7.05	-109.2	42.350	-4.4	0.70	27.46	27.16	1.7
6	1500	22.2	7.05	-110.0	42.218	-4.4	0.65	27.39	27.10	2.1
7	1504	22.0	7.05	-110.6	42.229	-4.3	0.60	27.42	27.12	2.5
8	1508	22.0	7.04	-112.0	42.181	-5.0	0.56	27.41	27.13	2.9
9	1512	21.8	7.04	-112.5	42.201	-5.1	0.53	27.49	27.21	3.3
10	1516	21.9	7.03	-112.6	42.249	-5.0	0.51	27.43	27.14	3.7
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/9/21 / 1550 RM Project Site/Subsite: NASA AMES / AOPC 8

Well ID: W1-14 Sample ID: ~~NASA AME~~ AOPC8 - W1-14 - 070921

Depth to Water Level: 5.54 ft below top of casing prior to sampling, 5.85 after sampling

Depth to Well Bottom: 17.56 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.15 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1455	19.1	6.97	-185.4	52.309	84.6	2.00	33.97	34.43	0.75
2	1500	18.6	6.86	-199.9	52.216	84.7	2.13	33.92	34.41	
3	1505	18.1	6.84	-184.7	52.179	28.8	1.94	33.94	34.43	
4	1510	18.1	6.91	-186.4	52.114	17.2	1.82	33.87	34.38	
5	1515	18.1	6.87	-183.6	52.240	13.8	1.77	33.94	34.43	
6	1520	18.0	6.83	-170.2	52.222	9.8	1.73	33.97	34.46	
7	1525	18.0	6.85	-152.2	52.314	8.6	1.70	34.08	34.60	
8	1530	17.9	6.82	-146.7	52.410	9.1	1.69	34.08	34.58	
9	1535	17.9	6.82	-141.9	52.480	12.0	1.67	34.09	34.62	
10	1540	17.9	6.85	-140.2	52.540	2.5	1.66	34.11	34.64	
11	1545	17.9	6.82	-139.0	52.653	1.8	1.65	34.18	34.74	
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/12/21 1315 Project Site/Subsite: NASA AMES/Lindbergh Ave Ditch

Well ID: 11E02A Sample ID: AOPC18-11E024-071221

Depth to Water Level: 7.55 ft below top of casing prior to sampling, 7.60 after sampling

Depth to Well Bottom: 20.04 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 8.9 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate ~~0.12~~ 0.14 RM Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1220	22.3	7.56	279.3	1.053	160.1	5.66	0.68	0.52	1.4
2	1225	21.2	7.42	286.0	1.042	~~25~~ 4.9	3.84	0.68	0.52	2.1
3	1230	20.7	7.40	285.7	1.046	5.0	3.75	0.68	0.52	2.8
4	1235	20.3	7.40	281.6	1.046	5.4	3.32	0.68	0.52	3.5
5	1240	20.2	7.38	278.2	1.043	4.9	3.01	0.68	0.52	4.2
6	1245	19.9	7.38	266.9	1.037	6.7	2.75	0.67	0.51	4.9
7	1250	19.8	7.37	263.1	1.032	5.3	2.07	0.67	0.51	5.6
8	1255	19.8	7.37	258.5	1.024	4.4	2.00	0.67	0.51	6.3
9	1300	19.7	7.37	254.2	1.019	3.8	1.94	0.66	0.51	7.0
10	1305	19.7	7.37	250.5	1.015	4.4	1.92	0.66	0.50	7.7
11	1310	19.8	7.37	248.3	1.013	4.9	1.91	0.66	0.50	8.4
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): No odor; clear; light sedimentation

Lock Conditions Lock / casing / housing intact

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/12 / 1320 Project Site/Subsite: NASA ARC

Well ID: WNB-7 Sample ID: AOPC18-WNB-7-071221

Depth to Water Level: 5.24 ft below top of casing prior to sampling, 5.25 after sampling

Depth to Well Bottom: 20.88 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 1.95 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.15 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids ~~(g/L)~~ mg/L	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1300	20.7	8.04	11.8	1.004	20.54	0.56	509	—	0.15
2	1304	20.4	8.02	-27.3	1.001	17.89	0.41	508	—	0.75
3	1308	20.4	8.02	-35.8	1.001	17.65	0.38	507	—	1.35
4	1312	20.3	8.02	-44.6	1.002	18.37	0.32	508	—	1.95
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments Salinity not working on sensor / YSI

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/12/21 / 1520 Project Site/Subsite: NASA AMES

Well ID: 11N21A1 Sample ID: AOPC1-11N21A1-071221

Depth to Water Level: 6.88 ft below top of casing prior to sampling, 6.87 after sampling

Depth to Well Bottom: 20.65 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 7.4 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.15 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1435	22.6	7.64	240.0	0.515	40.4	4.31	0.34	0.25	0.9
2	1440	22.1	7.55	242.0	0.515	50.1	3.96	0.33	0.25	1.65
3	1445	22.1	7.48	238.5	0.514	-3.9	2.46	0.33	0.25	2.4
4	1450	21.9	7.45	235.5	0.514	-4.3	2.46	0.33	0.25	3.15
5	1455	21.9	7.43	227.5	0.512	-3.9	2.26	0.33	0.25	3.9
6	1500	21.7	7.42	226.4	0.514	-4.0	2.10	0.33	0.25	4.65
7	1505	21.7	7.41	224.1	0.513	-3.8	2.02	0.33	0.25	5.4
8	1510	21.6	7.40	221.2	0.513	-4.0	1.98	0.33	0.25	6.15
9	1515	21.5	7.40	219.5	0.511	-4.1	1.91	0.33	0.25	6.9
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear; no odor

Lock Conditions Flush mounted well; nuts aren't secured, but flush; lock/cap intact

Comments _____

Sample(s) Collected By: Ryan Melendez

3

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/12/1610 Project Site/Subsite: NASA ARC

Well ID: W11-2 Sample ID: AOPC8-W11-2-071221

Depth to Water Level: 7.86 ft below top of casing prior to sampling, 8.13 after sampling

Depth to Well Bottom: 24.44 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch 4 inch

Total Purged 2.96 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.06 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1520	22.3	5.91	21.8	30.702	242.01	4.98	16	19.15	0.06
2	1525	22.7	5.71	36.4	30.454	239.46	4.39	16	19.22	0.36
3	1530	22.7	5.67	41.5	30.908	235.17	4.13	16	19.26	0.66
4	1535	23.0	5.64	43.8	30.953	231.74	3.81	16	19.29	0.96
5	1540	23.4	5.62	42.6	31.003	253.45	3.36	16	19.27	1.26
6	1545	23.7	5.59	43.4	31.048	268.51	2.95	16	19.30	1.56
7	1550	23.8	5.57	45.8	31.094	274.22	2.74	16	19.35	1.86
8	1555	23.9	5.54	51.6	31.102	266.75	2.59	16	19.34	2.16
9	1600	23.9	5.52	57.5	31.094	273.94	2.60	16	19.34	2.46
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/12/21 / 1805 Project Site/Subsite: NASA AMES /

Well ID: WU4 - 18 Sample ID: AOC 6 - WU4-18-071221

Depth to Water Level: 6.59 ft below top of casing prior to sampling. 6.62 after sampling

Depth to Well Bottom: 23.73 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 7.58 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.12 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1705	21.4	7.80	117.8	0.406	936.2	4.25	0.26	0.20	0.48
2	1710	21.2	7.57	109.8	0.411	386.6	4.89	0.27	0.20	1.08
3	1715	21.1	7.46	94.5	0.411	8.0	4.45	0.27	0.20	1.68
4	1720	21.2	7.46	92.7	0.412	35.9	5.93	0.27	0.20	2.28
5	1725	21.2	7.38	104.1	0.411	296.4	6.07	0.27	0.20	2.88
6	1730	20.9	7.37	103.5	0.411	290.8	3.00	0.27	0.20	3.48
7	1735	21.0	7.36	101.3	0.410	300.2	6.17	0.27	0.20	4.08
8	1740	20.8	7.35	103.1	0.409	659.2	5.92	0.27	0.20	4.68
9	1745	20.7	7.35	104.9	0.408	705.3	4.33	0.26	0.20	5.28
10	1750	20.8	7.35	94.3	0.407	742.3	5.42	0.26	0.20	5.88
11	1755	20.8	7.35	98.3	0.407	428.6	5.10	0.26	0.20	6.48
12	1800	20.7	7.35	90.6	0.407	5101.7	4.65	0.26	0.20	7.08
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear; no odors; very light sedimentation

Lock Conditions _____

Comments Water appears clear, but turbidity unable to stabilize, DO unable to stabilize

Sample(s) Collected By: Ryan Melendez

YSI unable to fully calibrate and stabilization parameters unable to be fully met.

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/13/21 / 12:45 Project Site/Subsite: NASA AMES / AOPC 25

Well ID: 15H12A Sample ID: AOPC25-15H12A-071321

Depth to Water Level: 5.99 ft below top of casing prior to sampling, 6.03 after sampling

Depth to Well Bottom: 15.49 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 5 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.15 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/l.	--	--	
1	12:10	21.6	7.23	112.0	0.794	25.56	0.58	0	0.39	0.75
2	12:15	21.5	7.24	105.4	0.792	25.27	0.36	0	0.39	1.50
3	12:20	21.5	7.24	98.6	0.786	18.46	0.33	0	0.39	2.25
4	12:25	21.2	7.23	90.8	0.784	13.32	0.29	0	0.38	3.00
5	12:30	21.2	7.23	89.7	0.784	13.43	0.27	0	0.38	3.75
6	12:35	21.4	7.23	84.2	0.784	12.29	0.26	0	0.38	4.50
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: M. Dahlquist

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/13/21 / 1315 Project Site/Subsite: NASA AMES / AOPC 25

Well ID: 15B10A Sample ID: AOPC25 - 15B10A - 071321

Depth to Water Level: 6.83 ft below top of casing prior to sampling, 7.38 after sampling

Depth to Well Bottom: 19.77 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 8.34 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.14 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1220	20.7	7.01	116.2	0.624	55.4	0.87	0.40	0.30	0.84
2	1225	20.6	7.01	106.5	0.614	36.8	0.80	0.40	0.30	~~0.98~~ 1.51
3	1230	20.5	6.99	99.5	0.610	30.9	0.64	0.40	0.30	2.24
4	1235	20.6	6.99	98.8	0.610	29.3	0.63	0.40	0.30	2.94
5	1240	20.6	6.99	95.0	0.610	29.5	0.59	0.40	0.30	3.64
6	1245	20.5	6.98	92.3	0.611	31.7	0.57	0.40	0.30	4.34
7	1250	20.4	6.99	90.6	0.611	41.3	0.55	0.40	0.30	5.04
8	1255	20.5	7.00	89.8	0.612	44.3	0.50	0.40	0.30	5.74
9	1300	20.7	7.00	88.4	0.614	43.2	0.49	0.40	0.30	6.44
10	1305	20.7	6.99	87.9	0.615	43.6	0.48	0.40	0.30	7.14
11	1310	20.6	6.98	89.4	0.616	42.3	0.47	0.40	0.30	7.84
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Light brown/yellow; no odor; light sedimentation

Lock Conditions Lock intact; flush mount missing nuts; well casing in good shape

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/13/21 / 1605 Project Site/Subsite: NASA AMES / AOPC 24

Well ID: 104A Sample ID: AOPC24-104A-071321

Depth to Water Level: 8.95 ft below top of casing prior to sampling, 8.97 after sampling

Depth to Well Bottom: 16.12 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 5.0 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1520	22.5	6.87	102.7	0.779	34.4	1.23	0.51	0.38	0.5
2	1525	22.7	6.82	106.8	0.798	50.2	0.88	0.52	0.39	1.0
3	1530	22.4	6.81	108.1	0.804	61.2	0.86	0.52	0.39	1.5
4	1535	22.2	6.80	107.7	0.814	64.9	0.71	0.53	0.40	2.0
5	1540	21.9	6.79	104.3	0.820	62.0	0.59	0.53	0.40	2.5
6	1545	22.2	6.78	104.9	0.824	62.3	0.55	0.54	0.40	3.0
7	1550	22.1	6.78	106.0	0.828	59.8	0.52	0.54	0.41	3.5
8	1555	22.0	6.77	106.1	0.829	57.7	0.51	0.54	0.41	4.0
9	1600	22.0	6.77	106.0	0.833	58.1	0.50	0.54	0.41	4.5
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear; light sediment

Lock Conditions Well casing intact; cap is tight/old, but functional; well top missing bolts

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/13/21 / 16:05 Project Site/Subsite: NASA AMES/AOPC 24

Well ID: WU4-1 Sample ID: AOPC24-WU4-1-071321

Depth to Water Level: 12.81 ft below top of casing prior to sampling, 12.88 after sampling

Depth to Well Bottom: 28.55 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 5.5 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	15:12	22.5	7.58	97.8	0.798	1.93	1.26	0	0.39	0.5
2	15:17	21.7	7.40	100.5	0.789	6.04	0.77	0	0.39	1.0
3	15:22	21.6	7.35	98.4	0.786	9.84	0.59	0	0.39	1.5
4	15:27	21.6	7.33	94.8	0.785	16.21	0.47	0	0.39	2.0
5	15:32	21.6	7.32	91.7	0.783	22.80	0.40	0	0.38	2.5
6	15:37	21.4	7.32	89.1	0.784	30.90	0.35	0	0.38	3.0
7	15:42	21.3	7.30	86.2	0.782	43.95	0.31	0	0.38	3.5
8	15:47	21.2	7.32	83.9	0.782	49.43	0.29	0	0.38	4.0
9	15:52	21.2	7.31	82.6	0.782	53.72	0.27	0	0.38	4.5
10	15:57	21.2	7.31	82.1	0.782	54.12	0.26	0	0.38	5.0
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: M. Dahlquist

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/14/21 / 1135 Project Site/Subsite: NASA AMES / AOPC 5

Well ID: WU4-19 Sample ID: AOPC5-WU4-19-071421

Depth to Water Level: 8.19 ft below top of casing prior to sampling, 8.17 after sampling

Depth to Well Bottom: 41.40 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 4.0 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1100	23.1	8.09	135.1	0.321	7.7	8.33	0.21	0.15	.5
2	1105	23.0	8.12	141.5	0.311	3.2	8.53	0.20	0.15	1.0
3	1110	23.0	8.12	141.9	0.310	3.7	8.54	0.20	0.15	1.5
4	1115	23.0	8.14	144.3	0.307	3.7	8.64	0.20	0.15	2.0
5	1120	22.9	8.16	145.6	0.306	3.6	8.71	0.20	0.15	2.5
6	1125	22.9	8.19	147.4	0.305	4.2	8.78	0.20	0.14	3.0
7	1130	22.9	8.19	147.6	0.304	4.9	8.80	0.20	0.14	3.5
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear; low sedimentation; no odor

Lock Conditions Casing intact; well cover intact

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/14 / 1620 Project Site/Subsite: NASA ARC

Well ID: W7-9 Sample ID: _____

Depth to Water Level: 8.41 ft below top of casing prior to sampling, 8.46 after sampling

Depth to Well Bottom: 42.53 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 7.2 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1515	21.0	10.05	155.1	0.217	75.5	10.09	0.11	0.10	0.2
2	1520	20.9	10.05	164.8	0.216	116.9	9.82	0.11	0.10	0.7
3	1525	20.7	10.05	170.6	0.215	125.3	9.65	0.11	0.10	1.2
4	1530	20.7	10.05	173.3	0.215	212.3	9.46	0.11	0.10	1.7
5	1535	20.7	10.05	175.1	0.215	248.1	9.27	0.11	0.10	2.2
6	1540	20.7	10.04	166.2	0.219	288.7	8.48	0.11	0.10	2.7
7	1545	20.7	10.05	146.2	0.220	221.4	7.55	0.11	0.10	3.2
8	1550	20.6	10.05	124.7	0.221	203.0	6.95	0.11	0.10	3.7
9	1555	20.6	10.04	105.1	0.221	191.7	6.28	0.11	0.10	4.2
10	1600	20.6	10.05	92.7	0.221	180.6	5.75	0.11	0.10	4.7
11	1605	20.5	10.05	89.0	0.221	170.0	5.23	0.11	0.10	5.2
12	1610	20.6	10.05	73.1	0.221	157.0	4.72	0.11	0.10	5.7
13	1615	20.5	10.05	68.3	0.222	149.9	4.35	0.11	0.10	6.2
14	1620	20.5	10.05	65.6	0.222	145.0	4.12	0.11	0.10	6.7
15	1625	20.5	10.05	63.5	0.222	139.0	3.95	0.11	0.10	7.2
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Mike Dahlquist

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/14/21 / 1620 Project Site/Subsite: NASA AMES AOPC5

Well ID: 14D39A Sample ID: AOPC5 - 14D39A - 071421

Depth to Water Level: 8.83 ft below top of casing prior to sampling, 8.96 after sampling

Depth to Well Bottom: 16.85 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 10.5 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1520	24.3	6.81	-60.7	0.756	55.8	3.75	0.49	0.37	0.5
2	1525	24.0	6.82	-68.9	0.764	16.6	1.70	0.50	0.38	1.0
3	1530	23.6	6.83	-81.0	0.776	14.7	0.82	0.50	0.38	1.5
4	1535	23.4	6.84	-82.8	0.773	14.0	0.68	0.50	0.38	2.0
5	1540	23.3	6.87	-86.3	0.770	13.5	0.58	0.50	0.38	2.5
6	1545	23.2	6.89	-89.0	0.766	12.6	0.54	0.50	0.37	3.0
7	1550	23.1	6.91	-91.8	0.762	10.4	0.49	0.50	0.37	3.5
8	1555	23.1	6.92	-91.2	0.763	9.5	0.48	0.50	0.37	4.0
9	1600	23.1	6.93	-91.4	0.764	7.9	0.47	0.50	0.37	4.5
10	1605	23.0	6.93	-91.3	0.764	7.6	0.46	0.50	0.37	5.0
11	1610	22.9	6.93	-91.9	0.764	7.4	0.46	0.50	0.37	5.5
12	1615	22.9	6.94	-92.6	0.765	7.2	0.45	0.50	0.37	6.0
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear color; light sedimentation; no odor

Lock Conditions Cap intact w/ hydrasleeve hardware; casing intact, but water in housing

Comments Stagnant water inside well housing; no odor

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/14/21 / 1820 Project Site/Subsite: NASA AMES/AOPC5

Well ID: WNB-14 Sample ID: AOPC5-WNB-14-071421

Depth to Water Level: 6.34 ft below top of casing prior to sampling, 6.40 after sampling

Depth to Well Bottom: 23.21 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1700	21.5	8.89	-20.9	0.235	187.6	1.16	0.15	0.11	0.5
2	1705	21.4	8.85	-50.9	0.233	152.2	0.67	0.15	0.11	1.0
3	1710	21.3	8.85	-61.9	0.232	142.3	0.60	0.15	0.11	1.5
4	1715	21.2	8.85	-77.6	0.231	110.9	0.54	0.15	0.11	2.0
5	1720	21.3	8.86	-89.5	0.231	90.1	0.50	0.15	0.11	2.5
6	1725	21.2	8.86	-101.7	0.231	78.0	0.48	0.15	0.11	3.0
7	1730	21.2	8.86	-107.6	0.231	73.1	0.48	0.15	0.11	3.5
8	1735	20.9	8.89	-127.6	0.230	57.6	0.56	0.15	0.11	4.0
9	1740	21.2	8.88	-128.9	0.231	52.8	0.51	0.15	0.11	4.5
10	1745	21.0	8.88	-131.8	0.231	52.3	0.54	0.15	0.11	5.0
11	1750	21.0	8.88	-139.7	0.231	51.2	0.47	0.15	0.11	5.5
12	1755	21.0	8.88	-146.0	0.231	49.2	0.47	0.15	0.11	6.0
13	1800	21.0	8.88	-149.7	0.231	46.7	0.45	0.15	0.11	6.5
14	1803	21.0	8.87	-154.8	0.231	42.9	0.45	0.15	0.11	~~7.0~~ 6.8
15	1806	21.0	8.88	-157.7	0.231	39.9	0.44	0.15	0.11	~~7.5~~ 7.1
16	1809	20.9	8.88	-162.0	0.231	38.1	0.44	0.15	0.11	7.4
17	1812	20.9	8.87	-165.2	0.231	37.9	0.44	0.15	0.11	7.7
18	1815	21.0	8.87	-166.7	0.231	38.1	0.43	0.15	0.11	8.0
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Cloudy; brownish color; medium sedimentation

Lock Conditions well casing intact w/ orange twist cap and hydrasleeve; well top missing nuts

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/15/21, 1230 Project Site/Subsite: NASA AMES/ADPC 1,7

Well ID: WU4-9 Sample ID: ADPC 1,7-WU4-9-071521

Depth to Water Level: 11.13 ft below top of casing prior to sampling, 12.67 after sampling

Depth to Well Bottom: 46.75 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 3.5 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1200	21.8	7.99	235.0	0.380	1.9	7.05	0.25	0.18	0.5
2	1205	21.1	8.00	241.0	0.335	1.3	6.73	0.22	0.16	1.0
3	1210	21.0	8.01	241.6	0.331	1.4	6.70	0.21	0.16	1.5
4	1215	21.0	8.01	242.3	0.320	1.4	6.77	0.21	0.15	2.0
5	1220	21.1	8.01	241.6	0.314	1.8	6.54	0.20	0.15	2.5
6	1225	21.0	8.01	240.8	0.310	1.9	6.53	0.20	0.15	3.0
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear; no odors; very light sedimentation

Lock Conditions Lock and housing intact; bolts stripped

Comments Area smelled heavily of VOCs.

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/16/21 / 1200 Project Site/Subsite: NASA AMES / AOPC 5

Well ID: 14D12A Sample ID: AOPC5 - 14D12A - 071621

Depth to Water Level: 9.55 ft below top of casing prior to sampling, 9.60 after sampling

Depth to Well Bottom: 25.75 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 6.5 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1105	19.8	7.14	213.0	0.646	113.2	0.77	0.42	0.31	1.0
2	1110	19.8	7.14	211.0	0.644	97.0	0.75	0.42	0.31	1.5
3	1115	19.3	7.14	209.5	0.643	93.0	0.80	0.42	0.31	2.0
4	1120	19.8	7.14	206.0	0.643	96.3	0.74	0.42	0.31	2.5
5	1125	19.8	7.14	202.5	0.644	13.4	0.63	0.42	0.31	3.0
6	1130	19.8	7.14	200.4	0.644	14.2	0.66	0.42	0.31	3.5
7	1135	19.6	7.14	195.1	0.644	9.9	0.66	0.42	0.31	4.0
8	1140	19.6	7.14	192.6	0.644	9.5	0.66	0.42	0.31	4.5
9	1145	19.7	7.14	190.6	0.645	9.5	0.57	0.42	0.31	5.0
10	1150	19.6	7.14	189.0	0.645	8.9	0.56	0.42	0.31	5.5
11	1155	19.5	7.14	187.2	0.645	9.0	0.57	0.42	0.31	6.0
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? No (Yes) (Sample ID of Duplicate) AOPC5 - 14D12A - 071621 - FD

MS/MSD Sample Collected? (No) Yes

Sample Remarks (odors, colors, sediment): Cloudy; no color; no odor; moderate sedimentation

Lock Conditions Well ~~casing~~ housing slightly ajar, spiders occupying casing; locks in place

Comments

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7-16-21 1355 Project Site/Subsite: NASA Ames / AOPC 3

Well ID: W19-2 Sample ID: AOPC3-W19-2-071621

Depth to Water Level: 7.60 ft below top of casing prior to sampling, 7.64 after sampling

Depth to Well Bottom: 57.65 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 8.2 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate .1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1234	21.5	7.05	-189.5	41.803	27.27	0.24	21	26.91	.1
2	1238	21.5	7.17	-231.4	41.882	24.51	0.15	21	26.93	.5
3	1242	21.5	7.20	-237.2	41.890	32.51	0.14	21	26.86	.9
4	1246	21.5	7.26	-248.5	41.774	50.51	0.12	21	26.88	1.3
5	1250	21.6	7.28	-250.2	41.815	75.60	0.12	21	26.87	1.7
6	1254	21.6	7.29	-250.4	41.749	103.40	0.12	21	26.84	2.1
7	1258	21.5	7.29	-247.6	41.780	99.17	0.11	21	26.84	2.5
8	1302	21.4	7.29	-248.6	41.673	95.62	0.11	21	26.84	2.9
9	1306	21.3	7.29	-248.5	41.780	111.96	0.11	21	26.82	3.3
10	1310	21.4	7.30	-252.8	41.673	169.88	0.11	21	26.77	3.7
11	1314	21.5	7.30	-251.9	41.674	336.98	0.10	21	26.77	4.1
12	1318	21.4	7.31	-255.1	41.623	231.89	0.10	21	26.71	4.5
13	1322	21.3	7.31	-252.8	41.679	241.83	0.10	21	26.73	4.9
14	1326	21.2	7.31	-255.7	41.649	253.51	0.10	21	26.75	5.3
15	1330	21.3	7.31	-253.9	41.612	263.49	0.10	21	26.70	5.7
16	1334	21.3	7.31	-255.4	41.542	277.12	0.10	21	26.72	6.1
17	1338	21.5	7.31	-259.2	41.526	325.76	0.10	21	26.72	6.5
18	1342	21.6	7.32	-264.5	41.511	268.49	0.09	21	26.67	6.9
19	1346	21.6	7.33	-262.4	41.505	267.21	0.09	21	26.65	7.3
20	1350	21.5	7.33	-265.1	41.447	267.33	0.09	21	26.65	7.7

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments Inside well cap very rusty

Sample(s) Collected By: _____

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

NASA AMES

Date/Time of Sample Collection: 7/15/21 / 1500 Project Site/Subsite: AOPC 1,7

Well ID: PZA1-5C Sample ID: AOPC 1,7 - PZA1 - 5C - 071521

Depth to Water Level: 9.57 ft below top of casing prior to sampling, 9.58 after sampling

Depth to Well Bottom: 26.50 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 6.5 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1400	21.4	7.30	197.4	0.1631	51.0	1.56	0.41	0.31	0.5
2	1405	21.3	7.29	197.3	0.1638	52.3	1.21	0.42	0.31	1.0
3	1410	21.3	7.25	194.6	0.1656	67.9	1.08	0.43	0.32	1.5
4	1415	21.2	7.22	188.4	0.1663	47.9	0.85	0.43	0.32	2.0
5	1420	21.2	7.21	185.5	0.1669	33.3	0.65	0.44	0.33	2.5
6	1425	21.1	7.20	180.3	0.1679	36.7	0.59	0.44	0.33	3.0
7	1430	21.2	7.19	177.6	0.1682	37.5	0.57	0.44	0.33	3.5
8	1435	21.2	7.19	175.2	0.1686	36.6	0.53	0.45	0.33	4.0
9	1440	21.2	7.19	171.1	0.1690	35.2	0.51	0.45	0.34	4.5
10	1445	21.1	7.18	165.8	0.1695	34.9	0.48	0.45	0.34	5.0
11	1450	21.1	7.18	164.9	0.1696	34.4	0.48	0.45	0.34	~~5.0~~ 5.5
12	1455	21.2	7.18	162.9	0.1697	33.7	0.46	0.45	0.34	6.0
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? No (Yes)

Sample Remarks (odors, colors, sediment): Light brown color / sediment; no odo.

Lock Conditions Lock / housing / casing intact

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/14/16, 1520 Project Site/Subsite: NASA ARC

Well ID: W7-10 Sample ID: AOPC3 - W7-10 - 071621

Depth to Water Level: 8.45 ft below top of casing prior to sampling, 8.44 after sampling

Depth to Well Bottom: 16.12 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 8.1 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.15 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1420	21.2	10.05	-88.2	0.532	41.8	5.08	0.27	0.26	0.3
2	1424	22.7	10.03	-95.2	0.532	48.3	4.61	0.27	0.26	0.9
3	1428	21.2	10.05	-94.6	0.529	54.6	4.59	0.27	0.26	1.5
4	1432	20.4	10.06	-94.7	0.527	62.3	4.55	0.27	0.25	2.1
5	1436	19.5	10.07	-97.0	0.523	64.3	3.96	0.27	6.25	2.7
6	1440	19.4	10.07	-99.7	0.526	31.1	0.87	0.27	0.26	3.3
7	1444	19.2	10.07	-102.2	0.531	38.1	0.76	0.27	0.26	3.9
8	1448	19.2	10.07	-103.8	0.531	36.5	0.70	0.27	6.26	4.5
9	1452	19.2	10.07	-104.4	0.532	38.1	0.64	0.27	6.26	5.1
10	1456	19.2	10.07	-104.9	0.532	41.7	0.59	0.27	0.26	5.7
11	1500	19.2	10.07	-105.5	0.532	41.5	0.56	0.27	0.26	6.3
12	1504	19.1	10.07	-106.0	0.532	52.8	0.50	0.27	0.26	6.9
13	1508	19.2	10.07	-106.5	0.532	54.3	0.50	0.27	0.26	7.5
14	1512	19.1	10.07	-105.9	0.532	54.2	0.49	0.27	0.26	8.1
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

11

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/16/21 / 1630 Project Site/Subsite: NASA AMES / AOPC 24

Well ID: 171A Sample ID: AOPC24 - 171A - 071621

Depth to Water Level: 8.44 ft below top of casing prior to sampling, 8.50 after sampling

Depth to Well Bottom: 27.10 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 8.0 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1520	21.3	7.30	99.0	0.718	110.2	1.99	0.47	0.35	1.0
2	1525	21.3	7.29	90.5	0.740	107.6	1.21	0.48	0.36	1.5
3	1530	21.0	7.28	74.0	0.743	104.5	0.86	0.48	0.36	2.0
4	1535	21.0	7.28	53.0	0.743	103.2	0.73	0.48	0.36	2.5
5	1540	20.8	7.28	40.6	0.738	100.3	0.71	0.49	0.37	3.0
6	1545	20.6	7.24	23.0	0.741	40.5	0.75	0.48	0.36	3.5
7	1550	20.7	7.23	23.5	0.739	66.7	0.80	0.48	0.36	4.0
8	1555	20.7	7.23	24.8	0.744	80.1	0.80	0.48	0.36	4.5
9	1600	20.7	7.22	24.4	0.743	117.5	0.75	0.48	0.36	5.0
10	1605	20.8	7.21	22.0	0.746	236.9	0.67	0.48	0.36	5.5
11	1610	20.8	7.21	22.1	0.744	236.4	0.67	0.48	0.36	6.0
12	1615	20.7	7.19	22.9	0.744	250.2	0.64	0.48	0.36	6.5
13	1620	20.7	7.18	26.5	0.746	220.4	0.60	0.49	0.37	7.0
14	1625	20.7	7.17	28.0	0.745	231.4	0.55	0.48	0.36	7.5
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions Housing, casing, lock intact

Comments Turbidity fluctuating greatly. Recommend using turbidity meters in lieu of YSI

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/19/21 1210 Project Site/Subsite: NASA AMES / AOPC 24

Well ID: W89-1 Sample ID: AOPC24-W89-1-071921

Depth to Water Level: 11.24 ft below top of casing prior to sampling, 11.40 after sampling

Depth to Well Bottom: 27.25 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 5.5 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1130	20.3	7.20	-85.6	0.639	13.0	0.57	0.41	0.31	1.5
2	1135	20.3	7.20	-87.5	0.1033	10.6	0.53	0.41	0.31	2.0
3	1140	20.3	7.20	-87.9	0.1030	11.2	0.51	0.41	0.31	2.5
4	1145	20.3	7.20	-88.2	0.1030	10.5	0.51	0.41	0.31	3.0
5	1150	20.3	7.20	-88.2	0.1029	9.2	0.49	0.41	0.31	3.5
6	1155	20.2	7.20	-88.4	0.1029	9.7	0.48	0.41	0.31	4.0
7	1200	20.2	7.20	-89.0	0.1029	9.6	0.48	0.41	0.31	4.5
8	1205	20.3	7.20	-89.4	0.1029	9.5	0.47	0.41	0.31	5.0
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Light orange/brown color; no odor; very light sediment

Lock Conditions Intact; no nuts to flush well top

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/19/21 1425 Project Site/Subsite: NASA Ames

Well ID: UST-MW-02 Sample ID: AOPC03-UST-MW-02-071921

Depth to Water Level: 6.33 ft below top of casing prior to sampling, 6.56 after sampling

Depth to Well Bottom: 16.36 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 1.94 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.04 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1334	26.2	7.60	75.6	1.007	26.1	3.44	0.65	0.49	0.10
2	1338	27.0	7.60	73.8	1.006	37.5	2.28	0.65	0.49	0.26
3	1342	27.7	7.64	78.1	1.010	85.5	2.24	0.66	0.49	0.42
4	1346	28.5	7.61	83.2	0.998	25.8	2.12	0.65	0.49	0.58
5	1350	29.2	7.61	82.6	0.984	39.1	2.04	0.64	0.48	0.74
6	1354	29.3	7.61	84.1	0.976	56.9	2.03	0.63	0.48	0.90
7	1358	29.2	7.62	81.4	0.972	75.1	2.06	0.63	0.47	1.06
8	1402	29.0	7.61	82.2	0.972	69.6	2.07	0.63	0.47	1.22
9	1406	28.6	7.61	86.7	0.956	79.8	2.06	0.62	0.47	1.38
10	1410	28.5	7.61	83.9	0.948	84.7	2.04	0.62	0.46	1.54
11	1414	28.3	7.61	83.3	0.943	95.6	3.17	0.61	0.46	1.70
12	1417	28.3	7.60	82.4	0.939	92.4	3.27	0.61	0.46	1.82
13	1420	28.2	7.60	82.5	0.936	98.2	3.32	0.61	0.46	1.94
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): no odor, clear color, no sediment

Lock Conditions OK

Comments _____

Sample(s) Collected By: E. McDonald

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/19 / 1430 Project Site/Subsite: NASA ARC

Well ID: W7-3 Sample ID: AOPC3-W7-3-071921

Depth to Water Level: 7.95 ft below top of casing prior to sampling, 7.95 after sampling

Depth to Well Bottom: 25.87 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 2.00 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.08 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1400	21.2	7.06	136.1	0.693	378.5	1.61	0	0.34	0.08
2	1404	21.1	6.94	136.1	0.734	428.34	1.15	0	0.36	0.4
3	1408	20.9	6.88	131.6	0.816	453.48	0.64	0	0.40	0.72
4	1412	20.8	6.87	127.4	0.844	454.18	0.53	0	0.42	1.04
5	1416	20.7	6.87	123.0	0.861	474.79	0.43	0	0.42	1.36
6	1420	20.6	6.86	118.5	0.870	483.47	0.37	0	0.43	1.68
7	1424	20.3	6.87	116.5	0.873	488.50	0.34	0	0.43	2.0
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? No (Yes) (Sample ID of Duplicate) AOPC3-W7-3-071921-FD

MS/MSD Sample Collected? (No) Yes

Sample Remarks (odors, colors, sediment): cloudy brown water

Lock Conditions good

Comments

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/19/21 1545 Project Site/Subsite: NASA AMES / AOPC 3

Well ID: W7-11 Sample ID: AOPC3-W7-11-071921

Depth to Water Level: 7.56 ft below top of casing prior to sampling, 7.56 after sampling

Depth to Well Bottom: ~~12.5~~ 12.41 ft. below top of casing (RM)

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 7.0 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	~~1445~~									~~2.0~~
2	~~1450~~	~~23.1~~	~~7.33~~							
3	1505	23.2	7.32	55.2	0.6065	32.2	1.17	0.43	0.32	3.0
4	1510	23.0	7.32	54.5	0.6065	26.2	0.606	0.43	0.32	3.5
5	1515	23.0	7.32	55.4	0.6063	26.1	0.54	0.43	0.32	4.0
6	1520	23.0	7.33	41.9	0.6065	27.0	0.48	0.43	0.32	4.5
7	1525	23.0	7.32	49.6	0.6067	27.3	0.47	0.43	0.32	5.0
8	1530	22.8	7.32	51.4	0.6067	27.6	0.46	0.43	0.32	5.5
9	1535	22.8	7.32	52.6	0.6067	27.7	0.45	0.43	0.32	6.0
10	1540	22.8	7.32	51.6	0.6068	27.7	0.45	0.44	0.33	6.5
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions: Intact. Well top blocked by some large metal beams

Comments: _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/19/21, 1545 Project Site/Subsite: NASA Ames PFAS

Well ID: W7-13 Sample ID: AOPC03-W7-13-071921

Depth to Water Level: 6.71 ft below top of casing prior to sampling, 6.73 after sampling

Depth to Well Bottom: 23.15 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 1.48 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.08 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1527	23.7	7.96	268.3	0.896	38.30	3.98	1	0.44	0.2
2	1531	24.1	7.69	261.0	0.898	40.60	4.11	1	044	0.52
3	1535	23.8	7.59	255.5	0.897	45.07	3.74	1	0.44	~~0.68~~ 0.8
4	1539	23.9	7.56	252.9	0898	49.73	3.64	1	0.44	1.16
5	1543	23.5	7.53	252.6	0.898	49.90	3.66	1	0.44	1.48
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): no odor, clear, no sediment

Lock Conditions good

Comments _____

Sample(s) Collected By: E. McDonald

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/19/21, 1735 Project Site/Subsite: NASA Area 1

Well ID: W4-14 Sample ID: AOPC21-W4-14-070921

Depth to Water Level: 6.11 ft below top of casing prior to sampling, 6.30 after sampling

Depth to Well Bottom: 16.22 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 3.37 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.08 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (~~S/m~~ mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1658	21.9	7.62	80.1	0.917	57.46	4.68	1	0.45	0.15
2	1702	21.4	7.48	75.0	0.924	45.15	3.58	1	0.46	0.47
3	1706	21.4	7.46	74.9	0.928	58.99	3.26	1	0.46	0.79
4	1710	21.2	7.43	72.0	0.934	50.92	3.01	1	0.46	1.11
5	1714	21.1	7.42	70.0	0.941	51.45	2.83	1	0.47	1.43
6	1718	21.1	7.41	68.2	0.951	65.32	2.72	1	0.47	1.75
7	1721	21.1	7.41	67.4	0.956	63.29	2.62	1	0.47	1.99
8	1724	21.1	7.41	65.0	0.963	90.22	2.51	1	0.48	2.23
9	1727	21.0	7.41	64.1	0.967	93.60	2.49	1	0.48	2.47
10	1730	21.0	7.40	63.4	0.972	92.99	2.42	1	0.48	2.87
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): clear, no odor, some sediment

Lock Conditions good

Comments _____

Sample(s) Collected By: E. McDonald

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/19/21 / 1750 Project Site/Subsite: NASA AMES / AOPC 21

Well ID: WL-6 Sample ID: AOPC21-WL-6-071921

Depth to Water Level: 10.06 ft below top of casing prior to sampling, 10.46 after sampling

Depth to Well Bottom: 18.67 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 10.0 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1700	22.9	7.40	117.5	0.6056	49.8	1.13	0.43	0.32	1.0
2	1705	22.8	7.38	110.1	0.6061	43.3	1.02	0.43	0.32	1.5
3	1710	22.8	7.38	104.5	0.6064	33.1	0.92	0.43	0.32	2.0
4	1715	22.7	7.37	98.8	0.6065	34.4	0.74	0.43	0.32	2.5
5	1720	22.7	7.37	95.4	0.6067	34.7	0.66	0.43	0.32	3.0
6	1725	22.7	7.37	96.0	0.6066	43.6	0.60	0.43	0.32	3.5
7	1730	22.6	7.37	92.2	~~0.6068~~ 0.6068	24.9	0.52	0.43	0.32	4.0
8	1735	22.6	7.37	88.4	0.6068	29.5	0.49	~~0.43~~	0.32	4.5
9	1740	22.5	7.37	85.7	0.6066	27.5	0.48	0.43	0.32	5.0
10	1745	22.5	7.37	84.4	0.6067	28.2	0.50	0.43	0.32	5.5
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Cloudy; grey; light sedimentation

Lock Conditions Intact; several black widows in well housing

Comments _____

Sample(s) Collected By: Ryan Mllendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/20/21 / 1335 Project Site/Subsite: NASA AMES / AOPC 9

Well ID: W2-13 Sample ID: AOPC9-W2-13-072021

Depth to Water Level: 5.96 ft below top of casing prior to sampling, 6.04 after sampling

Depth to Well Bottom: 18.36 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 4.9 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1300	22.2	6.82	283.6	19.718	28.1	0.560	12.81	11.76	1.5
2	1305	22.2	6.82	284.1	19.771	30.4	0.54	12.86	11.80	2.0
3	1310	22.2	6.82	283.9	19.840	30.4	0.52	12.89	11.84	2.5
4	1315	22.3	6.82	265.9	19.909	31.2	0.49	12.94	11.89	3.0
5	1320	22.2	6.83	258.2	20.030	33.2	0.46	13.03	11.97	3.5
6	1323	22.2	6.83	257.3	20.041	31.9	0.46	13.04	11.99	3.8
7	1326	22.2	6.83	254.1	20.058	31.3	0.46	13.04	11.99	4.1
8	1329	22.2	6.83	249.7	20.0606	31.7	0.46	13.04	11.99	4.4
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear; light sedimentation

Lock Conditions Lock/casing/housing intact

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/20/21, 1420 Project Site/Subsite: NASA Ames

Well ID: WUS-12 Sample ID: AOPC17,21-WUS-12-072021

Depth to Water Level: 5.60 ft below top of casing prior to sampling, 5.64 after sampling

Depth to Well Bottom: 53.79 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.075 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1255	22.7	7.57	61.3	0.229	5.34	6.81	0	0.11	0.15
2	1300	22.6	7.64	-57.9	0.291	69.54	4.82	0	0.14	0.525
3	1305	22.5	7.71	-74.0	0.354	36.08	4.24	0	0.17	0.9
4	1310	22.5	7.75	-75.4	0.393	22.53	3.93	0	0.19	1.275
5	1314	22.4	7.77	-76.8	0.416	18.91	3.81	0	0.20	~~0.34~~ 1.65
6	1318	22.4	7.79	-76.7	0.428	18.50	3.56	0	0.21	1.825
7	1322	22.4	7.80	-75.7	0.441	23.50	3.31	0	0.21	2.125
8	1325	22.4	7.82	-74.7	0.448	25.75	3.25	0	0.22	2.35
9	1328	22.4	7.82	-74.4	0.451	29.90	3.16	0	0.22	2.575
10	1331	22.4	7.83	-73.9	0.454	32.11	3.01	0	0.22	2.8
11	1334	22.3	7.83	-73.3	0.456	37.70	3.02	0	0.22	3.025
12	1337	22.3	7.84	-72.4	0.460	47.70	2.97	0	0.22	3.25
13	1340	22.3	7.84	-72.3	0.462	53.31	2.92	0	0.22	3.475
14	1344	22.2	7.85	-71.1	0.464	64.44	2.84	0	0.22	3.775
15	1348	22.2	7.85	-70.9	0.466	73.98	2.77	0	0.22	4.075
16	1351	22.1	7.85	-70.9	0.466	86.92	2.72	0	0.22	4.3
17	1354	22.2	7.85	-70.4	0.467	95.45	2.66	0	0.22	4.525
18	1357	22.2	7.86	-70.1	0.467	105.67	2.61	0	0.22	4.75
19	1400	22.2	7.86	-69.6	0.467	114.94	2.59	0	0.22	4.975
20	1403	22.1	7.86	-69.3	0.468	126.79	2.56	0	0.23	5.2

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? No (Yes)

Sample Remarks (odors, colors, sediment): no odor, clear, very little sediment

Lock Conditions good

Comments _____

Sample(s) Collected By: E. McDonald

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/20/21 1420 Project Site/Subsite: NASA Ames

Well ID: WUS-12 Sample ID: AOPC17,21-WUS-12-072021

Depth to Water Level: _____ ft below top of casing prior to sampling, _____ after sampling

Depth to Well Bottom: _____ ft. below top of casing

Method of Purging: Bladder Pump Peristaltic Pump See pg. 1

Well Diameter: 2 inch 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate _____ Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1406	22.2	7.86	-68.6	0.468	136.54	2.50	0	0.23	
2	1409	22.3	7.87	-68.3	0.469	141.44	2.45	0	0.23	
3	1412	22.3	7.87	-67.9	0.469	141.47	2.41	0	0.23	
4	1415	22.4	7.87	-66.8	0.469	150.76	2.39	0	0.23	
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? No Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? No Yes _____

Sample Remarks (odors, colors, sediment): See pg. 1

Lock Conditions _____

Comments _____

Sample(s) Collected By: _____

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/20/1540 Project Site/Subsite: NASA ARC

Well ID: WU5-10 Sample ID: ADPC21-WU5-10-072021

Depth to Water Level: 6.31 ft below top of casing prior to sampling, 6.31 after sampling

Depth to Well Bottom: 38.18 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1525	24.5	8.63	108.0	0.143	16.82	6.75	0	0.07	0.1
2	1529	24.4	8.56	109.9	0.140	15.85	6.48	0	0.07	0.5
3	1533	24.2	8.51	115.6	0.140	16.93	6.17	0	0.07	0.9
4	1537	24.1	8.49	119.2	0.139	17.48	6.16	0	0.06	
5 CV	~~+5~~									
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Elara McDonald

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/20/ 1410 Project Site/Subsite: NASA ARC

Well ID: W6-5 Sample ID: ADPC21-W6-5-072021

Depth to Water Level: 6.04 ft below top of casing prior to sampling, 6.10 after sampling

Depth to Well Bottom: 43.28 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (~~S/m~~ mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1310	23.3	7.14	176.0	0.877	17.5	17.5	0.44	0.43	0.1
2	1314	23.2	7.16	175.1	0.878	23.6	0.85	0.45	0.43	0.5
3	1318	23.3	7.15	173.9	0.879	25.5	0.77	0.45	0.43	0.9
4	1322	23.1	7.15	171.7	0.878	28.6	0.71	0.45	0.43	1.3
5	1326	23.1	7.15	168.5	0.879	31.3	0.66	0.45	0.43	1.7
6	1330 CM ~~1330~~	23.1	7.15	165.7	0.878	34.6	0.63	0.45	0.43	2.1
7	1334	23.1	7.16	162.6	0.877	36.5	0.58	0.45	0.43	2.5
8	1338	23.1	7.16	160.4	0.878	39.1	0.57	0.45	0.43	2.9
9	1342	23.0	7.16	158.5	0.878	40.6	0.55	0.44	0.43	3.3
10	1346	23.0	7.16	155.8	0.877	53.2	0.53	0.44	0.43	3.7
11	1350	23.0	7.16	154.4	0.877	54.8	0.54	0.44	0.43	4.1
12	1354	23.1	7.16	153.0	0.877	63.2	0.53	0.45	0.43	4.5
13	1358	23.1	7.16	151.4	0.877	70.3	0.50	0.44	0.43	4.9
14	1402	23.1	7.16	150.1	0.877	69.1	0.49	0.44	0.43	5.3
15	1406	23.0	7.17	148.7	0.877	71.4	0.49	0.44	0.43	
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/20/21 / 1615 Project Site/Subsite: NASA AMES / AOPC 21 ~~20~~

Well ID: W4-6 Sample ID: AOPC21-W4-6-072021

Depth to Water Level: 5.87 ft below top of casing prior to sampling, 6.64 after sampling

Depth to Well Bottom: 46.49 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1535	19.7	8.44	133.3	0.194	81.4	0.76	0.13	0.09	2.0
2	1540	19.7	8.42	134.7	0.191	76.4	0.69	0.12	0.09	2.5
3	1545	19.7	8.41	134.8	0.189	53.2	0.63	0.12	0.09	3.0
4	1550	20.0	8.41	134.4	0.188	44.8	0.60	0.12	0.09	3.5
5	1555	20.0	8.40	134.2	0.188	38.7	0.57	0.12	0.09	4.0
6	1600	20.4	8.39	132.4	0.188	37.0	0.55	0.12	0.09	4.5
7	1603	20.4	8.39	132.2	0.188	36.9	0.55	0.12	0.09	4.8
8	1606	20.4	8.39	131.8	0.188	36.8	0.53	0.12	0.09	5.1
9	1609	20.4	8.38	131.2	0.189	36.6	0.53	0.12	0.09	5.4
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear; light sedimentation

Lock Conditions Intact. Potentially blocked by bus

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/21 / 0540 Project Site/Subsite: NASA ARC

Well ID: WG62-13 Sample ID: ADPC10-WG62-13-072114-21

Depth to Water Level: 1.76 ft below top of casing prior to sampling, 1.91 after sampling

Depth to Well Bottom: 18.75 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 7.95 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.15 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	0445	17.2	6.91	222.0	1.881	14.87	1.30	1	0.97	0.15
2	0449	17.2	6.85	224.2	1.922	15.93	1.08	1	0.99	0.75
3	0453	17.0	6.88	224.0	2.006	16.65	0.66	1	1.04	1.35
4	0457	16.9	6.89	224.4	2.126	17.55	0.51	1	1.09	1.95
5	0501	16.9	6.94	152.1	2.192	20.82	0.39	1	1.13	2.55
6	0505	16.8	6.90	165.0	2.237	21.75	0.38	1	1.15	3.15
7	0509	16.8	6.90	174.3	2.306	66.82	0.34	1	1.19	3.75
8	0513	16.7	6.90	180.2	2.380	71.46	0.29	1	1.23	4.35
9	0517	16.7	6.89	184.7	2.461	71.36	0.30	1	1.28	4.95
10	0521	16.7	6.89	188.6	2.541	75.94	0.26	1	1.32	5.55
11	0525	16.7	6.90	131.9	2.596	78.69	0.24	1	1.35	6.15
12	0529	16.7	6.89	146.6	2.654	84.20	0.23	1	1.38	6.75
13	0533	16.7	6.89	156.1	2.699	88.58	0.21	1	1.41	7.35
14	0537	16.6	6.91	138.9	2.717	91.02	0.20	1	1.43	7.95
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/21/21 / 0545 Project Site/Subsite: NASA AMES / AOPC 10

Well ID: WGC2-8 Sample ID: AOPC 10 - WGC 2-8-072121

Depth to Water Level: 2.15 ft below top of casing prior to sampling, 2.15 after sampling

Depth to Well Bottom: 23.78 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 6.0 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	0500	17.7	7.64	222.9	1.420	23.5	4.44	0.93	0.73	1.5
2	0505	17.7	7.44	229.7	2.205	20.5	3.65	1.50	1.19	2.0
3	0510	17.7	6.77	151.5	14.576	17.7	2.30	10.00	9.05	2.5
4	0515	17.7	6.53	63.5	28.949	15.0	1.11	19.12	18.27	3.0
5	0520	17.7	6.50	52.1	33.246	13.0	0.82	21.68	20.97	3.5
6	0525	17.6	6.49	49.7	34.836	11.6	0.69	22.67	22.03	4.0
7	0528	17.6	6.50	50.4	35.128	11.6	0.67	22.86	22.21	4.3
8	0531	17.7	6.50	51.8	35.640	11.7	0.64	23.19	22.57	4.6
9	0534	17.6	6.51	54.5	36.104	10.8	0.61	23.49	22.86	4.9
10	0537	17.6	6.52	57.2	36.173	11.0	0.61	23.52	22.92	5.2
11	0540	17.5	6.52	58.6	36.272	10.9	0.60	23.59	22.99	5.5
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions Intact; water inside well housing

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/21/21 0730 Project Site/Subsite: NASA AMES / AOPC 10

Well ID: WGC2-10 Sample ID: AOPC10-WGC2-10-072121

Depth to Water Level: ~~0.9~~ 1.11 ft below top of casing prior to sampling, 1.10 after sampling

Depth to Well Bottom: 19.90 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	0700	16.9	7.07	-127.7	6.376	27.8	0.62	4.59	3.93	1.0
2	0705	17.1	6.88	-104.3	12.899	25.0	0.46	8.53	7.60	1.5
3	0710	17.1	6.84	-92.8	14.829	20.2	0.44	9.76	8.80	2.0
4	0713	17.1	6.83	-87.7	15.057	19.2	0.44	10.28	9.30	2.3
5	0716	17.1	6.83	-82.8	16.438	14.7	0.43	10.71	9.71	2.6
6	0719	17.1	6.82	-77.6	16.869	13.2	0.43	10.97	9.96	2.9
7	0722	17.1	6.82	-75.5	17.008	12.9	0.43	11.06	10.05	3.2
8	0725	17.1	6.82	-73.6	17.135	11.9	0.42	11.14	10.14	3.5
9	0728	17.1	6.82	-72.3	17.195	12.0	0.43	11.18	10.17	3.8
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Brown; swampy smell

Lock Conditions Intact; water inside well housing

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/21 / 0740 Project Site/Subsite: NASA ARC

Well ID: WGC2-1 Sample ID: ARCIO-WGC2-1-072121

Depth to Water Level: 0.23 ft below top of casing prior to sampling, ~~19.37~~ 0.21 after sampling

Depth to Well Bottom: 19.32 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 2.07 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.0 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	0705	18.3	8.49	23.6	14.928	126.18	5.17	8	8.72	0.15
2	0709	18.4	8.62	12.8	14.931	120.01	5.52	8	8.72	0.39
3	0713	18.7	8.74	-8.6	14.989	102.61	5.92	8	8.76	0.63
4	0717	18.8	8.85	-21.1	15.065	102.33	6.08	8	8.81	0.87
5	0721	18.9	8.94	-27.5	15.076	122.92	6.39	8	8.81	1.11
6	0725	19.1	9.01	-34.6	15.141	105.86	6.51	8	8.85	1.35
7	0729	19.3	9.09	-45.0	15.265	118.33	6.60	8	8.92	1.59
8	0733	19.4	9.16	-45.5	15.301	121.45	6.75	8	8.96	1.83
9	0737	19.4	9.17	-48.1	15.326	120.65	6.78	8	8.97	2.07
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Cloudy brown/grey, sulfur odor

Lock Conditions _____

Comments Replacement well for LGMW-1

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/22 / 1210 Project Site/Subsite: NASA ARC

Well ID: 10J02A Sample ID: AOPC22-10J02A-072221

Depth to Water Level: 6.79 ft below top of casing prior to sampling, 6.81 after sampling

Depth to Well Bottom: 16.26 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.075 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1124	23.9	7.27	145.2	1.078	22.99	2.91	1	0.53	0.075
2	1128	23.9	7.23	145.9	1.077	17.25	2.14	1	0.53	0.375
3	1132	23.8	7.23	143.3	1.081	12.64	1.68	1	0.53	0.675
4	1136	23.6	7.22	138.4	1.080	10.87	1.32	1	0.53	0.975
5	1140	23.3	7.22	134.7	1.080	10.52	0.96	1	0.53	1.275
6	1144	23.7	7.22	134.2	1.081	10.98	0.88	1	0.54	1.575
7	1148	23.5	7.22	128.8	1.081	11.65	0.76	1	0.54	1.875
8	1152	23.5	7.22	126.4	1.081	21.98	0.70	1	0.54	2.175
9	1156	23.4	7.22	124.0	1.083	23.82	0.61	1	0.54	2.475
10	1200	23.5	7.23	121.0	1.085	24.85	0.56	1	0.54	2.775
11	1204	23.4	7.22	118.8	1.084	25.73	0.50	1	0.54	3.075
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? No (Yes) (Sample ID of Duplicate) AOPC22-10J02A-072221-FD

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/22/21 / 1220 Project Site/Subsite: NASA AMES / AOPC 5

Well ID: 14D28A Sample ID: AOPC5 - 14D28A - 072221

Depth to Water Level: 8.06 ft below top of casing prior to sampling, 8.10 after sampling

Depth to Well Bottom: 16.14 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged 4.4 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1145	21.0	7.05	101.4	0.742	15.8	0.70	0.48	0.36	1.0
2	1150	21.0	7.05	111.3	0.740	17.9	0.63	0.48	0.36	1.5
3	1155	20.9	7.05	121.4	0.742	14.8	0.59	0.48	0.36	2.0
4	1200	20.8	7.05	131.6	0.742	15.2	0.56	0.48	0.36	2.5
5	1205	20.9	7.05	135.9	0.742	14.9	0.53	0.48	0.36	3.0
6	1208	20.9	7.05	137.2	0.742	13.5	0.52	0.48	0.36	3.3
7	1211	20.9	7.05	140.9	0.744	13.0	0.51	0.48	0.36	3.6
8	1214	20.8	7.05	141.3	0.743	12.9	0.51	0.48	0.36	3.9
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear, light sediment; no odor

Lock Conditions Intact

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/22/21 / 1345 Project Site/Subsite: NASA AMES/AOPC5

Well ID: 14D36A Sample ID: AOPC5-14D36A-072221

Depth to Water Level: 7.60 ft below top of casing prior to sampling, 7.80 after sampling

Depth to Well Bottom: 16.77 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 4.8 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1310	22.2	7.06	143.7	0.7707	70.0	0.61	0.50	0.38	1.5
2	1315	22.1	7.06	138.4	0.770	72.5	0.59	0.50	0.38	2.0
3	1320	22.0	7.06	131.1	0.772	72.4	0.55	0.50	0.38	2.5
4	1323	22.0	7.06	127.4	0.773	72.5	0.53	0.50	0.38	2.8
5	1326	22.1	7.06	125.2	0.774	76.1	0.52	0.50	0.38	3.1
6	1329	22.0	7.06	123.6	0.775	77.2	0.51	0.50	0.38	3.4
7	1332	22.0	7.06	120.1	0.775	74.10	0.50	0.50	0.38	3.7
8	1335	22.0	7.06	118.7	0.776	74.5	0.50	0.50	0.38	4.0
9	1338	22.0	7.06	117.0	0.776	75.0	0.50	0.50	0.38	4.3
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions Intact; well housing top has a bit of damage

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/22 1350 Project Site/Subsite: NASA ARC

Well ID: 10501A Sample ID: AOPC22-10501A-072221

Depth to Water Level: 6.52 ft below top of casing prior to sampling, 6.55 after sampling

Depth to Well Bottom: 12.34 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measurement Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1308	23.5	7.24	117.8	1.160	13.92	4.35	1	0.57	0.1
2	1312	22.4	7.14	125.8	1.147	9.34	3.11	1	0.57	0.5
3	1316	21.8	7.12	128.1	1.143	6.57	2.73	1	0.57	0.9
4	1320	21.5	7.12	128.3	1.141	5.71	2.43	1	0.57	1.3
5	1324	21.3	7.13	128.2	1.138	5.76	2.20	1	0.57	1.7
6	1328	21.3	7.13	127.1	1.141	5.83	2.02	1	0.57	2.1
7	1332	21.1	7.13	126.4	1.140	5.52	1.97	1	0.57	2.5
8	1336	21.2	7.13	124.9	1.142	6.14	1.77	1	0.57	2.9
9	1340	21.1	7.13	123.7	1.142	5.93	1.65	1	0.57	3.3
10	1344	21.1	7.13	122.7	1.143	6.18	1.63	1	0.57	3.7
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/22, 1540 Project Site/Subsite: NASA ARC

Well ID: 14D02A Sample ID: AOPC6-14D02A-072221

Depth to Water Level: 6.89 ft below top of casing prior to sampling, 6.92 after sampling

Depth to Well Bottom: 23.85 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 3.3 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1504	24.8	7.15	-75.2	0.847	11.17	1.72	0	0.41	0.1
2	1508	24.5	7.09	-95.0	0.844	14.31	2.17	0	0.41	0.5
3	1512	24.3	7.08	-102.7	0.844	14.21	1.24	0	0.41	0.9
4	1516	24.3	7.08	-111.8	0.845	19.21	0.90	0	0.41	1.3
5	1520	24.3	7.08	-114.9	0.847	19.15	0.54	0	0.41	1.7
6	1524	24.0	7.09	-124.6	0.849	19.02	0.42	0	0.42	2.1
7	1528	24.0	7.10	-132.9	0.851	18.74	0.44	0	0.42	2.5
8	1532	24.0	7.11	-142.0	0.853	19.06	0.35	0	0.42	2.9
9	1536	23.9	7.11	-143.1	0.855	14.38	0.33	0	0.42	3.3
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/22/21 / 1550 Project Site/Subsite: NASA AMES / AOPC 1, 6, 7

Well ID: 14CG0A Sample ID: AOPC1,6,7-14CG0A-072221

Depth to Water Level: 8.80 ft below top of casing prior to sampling, 8.79 after sampling

Depth to Well Bottom: 15.87 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 4.5 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1520	21.0	7.35	-85.0	0.322	9.3	0.69	0.21	0.15	1.5
2	1525	21.1	7.35	-87.9	0.322	10.5	0.57	0.21	0.15	2.0
3	1530	21.1	7.35	-89.9	0.322	12.6	0.55	0.21	0.15	2.5
4	1533	21.1	7.35	-90.1	0.322	10.6	0.53	0.21	0.15	2.8
5	1536	21.1	7.34	-89.8	0.322	9.3	0.56	0.21	0.15	3.1
6	1539	21.1	7.34	-88.9	0.322	6.6	0.53	0.21	0.15	3.4
7	1542	21.1	7.34	-90.2	0.323	6.0	0.51	0.21	0.15	3.7
8	1545	21.0	7.34	-90.4	0.322	6.8	0.50	0.21	0.15	4.0
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear; no odor

Lock Conditions Intact; missing one bolt

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/23/21, 1325 Project Site/Subsite: NASA AMES/AOPC 18

Well ID: A Sample ID: AOPC18 - A - 072321

Depth to Water Level: 10.10 ft below top of casing prior to sampling, 10.12 after sampling

Depth to Well Bottom: 17.96 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1210	22.3	7.40	101.2	0.901	433.1	1.58	0.58	0.44	2.0
2	1215	22.2	7.40	100.9	0.890	436.4	1.53	0.58	0.44	2.5
3	1220	22.2	7.40	104.0	0.882	348.0	1.59	0.57	0.43	3.0
4	1225	22.2	7.42	113.1	0.880	278.2	2.18	0.57	0.43	3.5
5	1230	22.1	7.41	110.0	0.876	269.9	1.71	0.57	0.43	4.0
6	1235	22.1	7.41	105.0	0.870	207.8	1.59	0.57	0.43	4.5
7	1240	22.1	7.41	102.9	0.868	177.8	1.58	0.56	0.43	5.0
8	1245	22.1	7.41	102.2	0.865	175.3	1.58	0.56	0.43	5.5
9	1250	22.1	7.41	101.9	0.863	156.4	1.57	0.56	0.42	6.0
10	1255	22.1	7.41	101.8	0.862	125.6	1.54	0.56	0.42	6.5
11	1300	22.1	7.41	101.2	0.860	125.0	1.49	0.56	0.42	7.0
12	1305	22.1	7.41	101.0	0.859	105.2	1.48	0.56	0.42	7.5
13	1310	22.2	7.41	100.2	0.856	93.2	1.42	0.56	0.42	8.0
14	1315	22.1	7.41	100.0	0.856	90.9	1.42	0.56	0.42	8.5
15	1318	22.1	7.41	99.8	0.854	89.9	1.39	0.56	0.42	8.8
16	1321	22.1	7.41	99.8	0.853	89.8	1.38	0.55	0.42	9.1
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Brown; cloudy; no odor

Lock Conditions Intact

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/27/21 1135 Project Site/Subsite: NASA AMES/ AOPC 2,26

Well ID: D Sample ID: AOPC 2,26 - D - 072721

Depth to Water Level: 7.66 ft below top of casing prior to sampling, 7.65 after sampling

Depth to Well Bottom: 15.99 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 8.1 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance ~~(S/m)~~ mS/cm	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1030	20.4	6.97	123.4	0.922	357.9	2.34	0.60	0.45	1.5
2	1035	20.4	6.96	127.2	0.917	309.6	2.54	0.60	0.45	2.0
3	1040	20.4	6.96	131.1	0.912	211.1	2.73	0.59	0.45	2.5
4	1045	20.4	6.95	134.6	0.912	178.5	2.73	0.59	0.45	3.0
5	1050	20.4	6.94	135.3	0.913	103.4	2.65	0.59	0.45	3.5
6	1055	20.4	6.94	135.4	0.913	96.5	2.54	0.59	0.45	4.0
7	1100	20.5	6.94	135.5	0.915	81.2	2.53	0.59	0.45	4.5
8	1105	20.5	6.94	135.9	0.916	72.8	2.55	0.60	0.45	5.0
9	1110	20.5	6.94	136.3	0.918	74.1	2.61	0.60	0.45	5.5
10	1115	20.5	6.94	137.6	0.918	73.0	2.71	0.60	0.45	6.0
11	1120	20.6	6.94	138.6	0.919	72.9	2.76	0.60	0.45	6.5
12	1125	20.6	6.94	139.0	0.920	76.2	2.82	0.60	0.45	7.0
13	1128	20.6	6.94	139.4	0.921	78.3	2.85	0.60	0.45	7.3
14	1131	20.7	6.94	139.9	0.922	78.3	2.86	0.60	0.46	7.6
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Brown, turbid; no odor

Lock Conditions Intact

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/27/21 1337 Project Site/Subsite: NASA AMES / AOPC4,11

Well ID: H Sample ID: AOPC4,11-H-072721

Depth to Water Level: 5.74 ft below top of casing prior to sampling, 5.86 after sampling

Depth to Well Bottom: 19.99 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 6.7 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1245	21.6	6.52	28.9	44.645	299.8	0.57	29.04	28.92	1.5
2	1250	21.6	6.53	25.8	44.753	254.0	0.48	29.10	28.99	2.0
3	1255	21.4	6.53	27.3	44.928	150.6	0.47	29.22	29.12	2.5
4	1300	21.4	6.54	27.6	44.947	148.6	0.44	29.23	29.14	3.0
5	1305	21.4	6.53	26.7	45.008	138.5	0.42	29.29	29.19	3.5
6	1308	21.4	6.53	26.3	45.053	108.9	0.42	29.30	29.21	3.8
7	1311	21.4	6.53	25.5	45.147	109.3	0.42	29.33	29.24	4.1
8	1314	21.4	6.53	24.6	45.129	106.9	0.42	29.34	29.27	4.4
9	1317	21.6	6.52	23.7	45.154	83.4	0.40	29.36	29.26	4.7
10	1320	21.7	6.52	23.0	45.233	76.5	0.40	29.41	29.34	5.0
11	1323	21.7	6.52	22.9	45.227	76.9	0.40	29.41	29.33	5.3
12	1326	21.7	6.52	22.7	45.237	75.9	0.40	29.41	29.33	5.6
13	1329	21.8	6.52	22.4	45.312	74.9	0.39	29.45	29.38	5.9
14	1332	21.9	6.52	22.2	45.409	74.5	0.39	29.50	29.43	6.2
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Cloudy; grey/brown

Lock Conditions Intact

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/27/21 / 1620 Project Site/Subsite: NASA AMES / AOPC 1,7

Well ID: UST29-MW02 Sample ID: AOPC 1,7-UST29-MW02-072721

Depth to Water Level: 5.59 ft below top of casing prior to sampling, 8.70 after sampling

Depth to Well Bottom: RM ~~5.59~~ 17.93 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 10.71 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.09 Liters/Min 0.09

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10% when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1520	21.2	7.25	124.7	0.739	49.8	0.84	0.48	0.36	1.35
2	1525	21.0	7.24	120.2	0.720	41.00	0.71	0.47	0.35	1.80
3	1530	20.8	7.24	116.2	0.715	37.0	0.66	0.47	0.35	2.25
4	1535	20.8	7.23	113.6	0.719	38.2	0.60	0.47	0.35	2.70
5	1540	20.7	7.21	111.0	0.726	25.2	0.60	0.47	0.36	3.15
6	1545	20.7	7.23	48.5	0.730	23.6	0.56	0.47	0.36	3.60
7	1550	20.6	7.20	68.0	0.732	23.8	0.54	0.48	0.36	4.05
8	1555	20.6	7.19	80.3	0.733	26.1	0.53	0.48	0.36	4.50
9	1600	20.5	7.19	84.4	0.734	27.8	0.51	0.48	0.36	4.95
10	1605	20.6	7.18	85.8	0.735	34.5	0.50	0.48	0.36	5.40
11	1608	20.5	7.18	86.2	0.737	37.9	0.50	0.48	0.36	5.67
12	1611	20.5	7.18	86.3	0.739	38.8	0.50	0.48	0.36	5.94
13	1614	20.4	7.17	86.7	0.739	42.4	0.50	0.48	0.36	6.21
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): heavy sedimentation, brown, no odors.

Lock Conditions intact

Comments _____

Sample(s) Collected By: RM, AM

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/27/21, 1820 Project Site/Subsite: NASA Ames / AOPC 1,7

Well ID: W20-01 Sample ID: AOPC 1,7-W20-01-072721

Depth to Water Level: 7.26 ft below top of casing prior to sampling, 7.63 after sampling

Depth to Well Bottom: 19.40 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 8.15 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.09 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1705	19.9	7.23	89.4	0.553	74.1	2.44	0.36	0.27	1.35
2	1710	19.8	7.23	74.0	0.554	40.2	2.26	0.36	0.27	1.80
3	1715	19.7	7.22	48.3	0.554	31.0	1.95	0.36	0.27	2.25
4	1720	19.7	7.22	7.6	0.555	25.1	1.56	0.36	0.27	2.70
5	1725	19.6	7.22	-26.6	0.555	25.4	1.36	0.36	0.27	3.15
6	1730	19.6	7.22	-47.2	0.555	26.4	1.17	0.36	0.27	3.60
7	1735	19.5	7.22	-60.0	0.555	24.1	1.07	0.36	0.27	4.05
8	1740	19.5	7.22	-69.1	0.554	19.3	0.98	0.36	0.27	4.50
9	1745	19.5	7.22	-74.2	0.554	21.2	0.87	0.36	0.27	4.95
10	1750	19.5	7.22	-79.6	0.554	20.8	0.81	0.36	0.27	5.40
11	1755	19.5	7.21	-84.2	0.554	22.8	0.76	0.36	0.27	5.85
12	1800	19.4	7.21	-87.3	0.555	18.00	0.73	0.36	0.27	6.30
13	1803	19.3	7.21	-89.6	0.556	22.00	0.68	0.36	0.27	6.57
14	1806	19.3	7.21	-92.2	0.557	19.4	0.64	0.36	0.27	6.84
15	1809	19.3	7.21	-93.9	0.558	19.8	0.63	0.36	0.27	7.11
16	1812	19.3	7.21	-95.1	0.559	18.4	0.62	0.36	0.27	7.38
17	1815	19.3	7.21	-96.1	0.561	13.8	0.61	0.36	0.27	7.65
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): heavy sedimentation, no odor, brown

Lock Conditions intact

Comments water in the well housing @ well casing height

Sample(s) Collected By: Rull, All

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/28 / 1025 Project Site/Subsite: NAS A ARC

Well ID: PFAS-6 Sample ID: AOOC2 - PFAS-6 - 072821

Depth to Water Level: 7.44 ft below top of casing prior to sampling, _____ after sampling

Depth to Well Bottom: 18.07 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.05 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	0950	21.6	7.28	98.8	1.111	265.04	1.51	1	0.55	0.05
2	0953	21.5	7.15	94.2	1.106	287.63	0.93	1	0.55	0.20
3	0956	21.6	7.13	88.7	1.105	290.58	0.72	1	0.55	0.35
4	0959	21.5	7.13	85.4	1.106	296.15	0.67	1	0.55	0.50
5	1002	21.4	7.12	82.9	1.106	~~882~~ 282.63	0.64	1	0.55	0.65
6	1005	21.3	7.12	80.8	1.107	269.44	0.64	1	0.55	0.8
7	1008	21.2	7.12	79.2	1.108	247.34	0.65	1	0.55	0.95
8	1011	21.2	7.13	78.7	1.107	201.29	0.65	1	0.55	1.10
9	1014	21.2	7.13	78.4	1.108	161.15	0.66	1	0.55	1.25
10	1017	21.2	7.13	78.2	1.109	163.17	0.67	1	0.55	1.40
11	1020	21.1	7.13	78.1	1.111	153.01	0.67	1	0.55	
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments Well 6 slow discharge → low flow rate + 3 min intervals used

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/28/21 / 1210 Project Site/Subsite: NASA AMES / AOPC 21

Well ID: WSW-5 Sample ID: AOPC21-WSW-5-072821

Depth to Water Level: 5.76 ft below top of casing prior to sampling, 7.78 after sampling

Depth to Well Bottom: 19.32 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 4.4 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.10 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1140	20.7	7.08	18.8	0.746	12.8	0.64	0.48	0.37	1.5
2	1145	20.7	7.08	17.1	0.745	15.5	0.59	0.48	0.37	2.0
3	1150	20.8	7.08	14.8	0.746	12.0	0.56	0.49	0.37	2.5
4	1155	20.8	7.08	13.3	0.747	13.0	0.55	0.49	0.37	3.0
5	1158	20.8	7.08	12.5	0.748	12.8	0.53	0.49	0.37	3.3
6	1201	20.8	7.08	13.6	0.748	11.9	0.53	0.49	0.37	3.6
7	1204	20.7	7.08	13.5	0.748	11.4	0.51	0.49	0.37	3.9
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): Clear; no odor; light sedimentation

Lock Conditions Intact; rusty

Comments _____

Sample(s) Collected By: Ryan Melendez

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/28 / 1300 Project Site/Subsite: NASA ARC

Well ID: W6C2-11 Sample ID: AOPC10-W6C2-11-072821

Depth to Water Level: 0.21 ft below top of casing prior to sampling, 0.30 after sampling

Depth to Well Bottom: 18.94 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1228	21.5	7.37	140.6	5.211	51.29	4.00	3	2.82	0.1
2	1232	19.1	7.20	127.6	5.205	44.36	1.49	3	2.81	0.5
3	1236	18.4	7.14	113.7	5.333	43.45	0.84	3	2.90	0.9
4	1240	18.4	7.13	108.6	5.429	49.55	0.61	3	2.96	1.3
5	1244	18.3	7.10	101.5	5.619	48.54	0.38	3	3.07	1.7
6	1248	18.2	7.10	96.1	5.677	46.05	0.29	3	3.15	2.1
7	1252	18.1	7.09	91.3	5.732	43.79	0.25	3	3.21	2.5
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/28 / 1430 Project Site/Subsite: NASA AMES / AOPC9

Well ID: W2-12 Sample ID: AOPC9-W2-12-072821

Depth to Water Level: 6.98 ft below top of casing prior to sampling, _____ after sampling

Depth to Well Bottom: 16.71 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1400	23.1	7.20	109.1	1.746	72.53	0.47	1	0.88	0.1
2	1404	22.6	7.24	107.7	1.741	48.51	0.44	1	0.88	0.5
3	1408	22.3	7.24	106.4	1.736	44.65	0.40	1	0.88	0.9
4	1412	21.8	7.24	105.0	1.729	33.97	0.34	1	0.88	1.3
5	1416	21.4	7.24	103.8	1.728	25.98	0.32	1	0.88	1.7
6	1420	21.7	7.24	102.7	1.728	24.36	0.31	1	0.88	2.1
7	1424	21.9	7.24	100.7	1.728	23.69	0.29	1	0.88	2.5
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/29/1100 Project Site/Subsite: NASA ARC

Well ID: PFAS-C Sample ID: ADPC2,26-PFAS-C-072921

Depth to Water Level: 7.16 ft below top of casing prior to sampling, 7.16 after sampling

Depth to Well Bottom: 18.02 CN ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged 4.23 Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.09 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1010	22.1	6.98	138.5	0.923	82.6	2.80	0.60	0.46	0.63
2	1014	22.6	6.98	141.7	0.911	64.8	2.76	0.59	0.45	0.99
3	1018	22.1	6.98	140.9	0.906	50.2	2.72	0.59	0.45	1.35
4	1022	22.1	6.98	140.8	0.904	43.2	2.71	0.59	0.45	1.71
5	1026	22.3	6.98	141.2	0.902	38.5	2.69	0.59	0.44	2.07
6	1030	22.4	6.98	142.1	0.902	32.6	2.70	0.59	0.44	2.43
7	1034	22.6	6.98	141.4	0.902	26.2	2.70	0.59	0.44	2.79
8	1038	22.6	6.97	141.5	0.902	24.1	2.71	0.59	0.44	3.15
9	1042	22.7	6.97	141.9	0.902	21.8	2.71	0.59	0.44	3.51
10	1046	22.5	6.97	141.7	0.901	21.6	2.73	0.59	0.44	3.87
11	1050	22.6	6.97	142.3	0.903	20.3	2.72	0.59	0.44	4.23
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves, Anya Mikheicheva

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/29 , 1220 Project Site/Subsite: NASA ARC

Well ID: WW4-25 Sample ID: AOPCI - WW4-25-072921

Depth to Water Level: 6.16 ft below top of casing prior to sampling, 6.11 after sampling

Depth to Well Bottom: 17.42 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: 2 inch (4 inch)

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1150	24.1	7.08	132.1	0.841	26.8	2.07	0.55	0.41	0.1
2	1154	23.7	7.08	121.5	0.840	34.9	1.10	0.55	0.41	0.5
3	1158	23.5	7.07	111.5	0.843	42.9	0.85	0.55	0.41	0.9
4	1202	23.3	7.07	107.2	0.842	48.6	0.73	0.55	0.41	1.3
5	1206	23.1	7.07	104.8	0.843	56.8	0.67	0.55	0.41	1.7
6	1210	23.0	7.07	104.1	0.844	117.4	0.64	0.55	0.41	2.1
7	1214	23.0	7.07	102.9	0.846	120.9	0.61	0.55	0.41	2.5
8	1218	23.1	7.07	101.7	0.847	125.7	0.60	0.55	0.42	2.9
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/29 / 1445 Project Site/Subsite: NASA ARC

Well ID: PFAS-E Sample ID: AOPC2-PFAS-E-072921

Depth to Water Level: 5.24 ft below top of casing prior to sampling, 5.25 after sampling

Depth to Well Bottom: 21.31 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.1 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%. when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1410	20.4	6.97	115.5	0.885	772.9	1.48	0.58	0.44	0.1
2	1414	20.0	6.96	117.0	0.890	670.2	1.20	0.58	0.44	0.5
3	1418	20.1	6.96	116.7	0.892	718.1	1.08	0.58	0.44	0.9
4	1422	19.8	6.96	115.8	0.895	631.7	0.99	0.58	0.44	1.3
5	1426	19.7	6.96	114.6	0.898	557.0	0.95	0.58	0.44	1.7
6	1430	19.8	6.95	113.2	0.899	503.6	0.89	0.58	0.44	2.1
7	1434	19.8	6.95	111.9	0.901	528.7	0.84	0.59	0.45	2.5
8	1438	19.7	6.95	110.8	0.902	472.4	0.81	0.59	0.45	2.9
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? (No) Yes (Sample ID of Duplicate) _____

MS/MSD Sample Collected? No (Yes) _____

Sample Remarks (odors, colors, sediment): Cloudy grey/brown

Lock Conditions _____

Comments _____

Sample(s) Collected By: Callie Neaves

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/29 / 1525 Project Site/Subsite: NASA AMES / AOPC2

Well ID: PFAS-F Sample ID: AOPC2-PFAS-F-072921

Depth to Water Level: 7.95 ft below top of casing prior to sampling, 8.01 after sampling

Depth to Well Bottom: 25.00 ft. below top of casing

Method of Purging: (Bladder Pump) Peristaltic Pump

Well Diameter: (2 inch) 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate 0.09 Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1345	18.6	7.22	-65.8	0.852	187.7	1.54	0	0.42	1.35
2	1350	18.6	7.21	-74.1	0.851	375.4	1.54	0	0.42	1.80
3	1355	18.5	7.20	-78.2	0.860	60.6	0.97	0	0.43	2.25
4	1400	18.1	7.19	-78.5	0.875	58.2	0.60	0	0.43	2.70
5	1405	17.9	7.18	-78.0	0.884	50.2	0.62	0	0.44	3.15
6	1410	17.7	7.17	-78.1	0.892	49.5	0.44	0	0.44	3.60
7	1415	17.7	7.17	-77.4	0.899	38.2	0.77	0	0.44	4.05
8	1420	17.8	7.16	-77.0	0.907	36.1	0.91	0	0.45	4.50
9	1425	17.6	7.16	-76.0	0.912	33.5	0.89	0	0.45	4.95
10	1430	17.8	7.15	-75.5	0.917	38.1	0.82	0	0.45	5.40
11	1435	17.8	7.15	-75.1	0.921	39.6	0.42	0	0.46	5.85
12	1440	17.5	7.14	-73.5	0.924	40.2	0.48	0	0.46	6.30
13	1445	17.4	7.14	-74.1	0.926	45.2	0.41	0	0.46	6.75
14	1450	17.7	7.14	-74.1	0.926	63.2	0.40	0	0.46	7.20
15	1455	17.8	7.14	-73.8	0.930	84.1	0.34	0	0.46	7.65
16	1458	17.8	7.13	-74.1	0.931	93.8	0.34	0	0.46	7.92
17	1501	17.6	7.13	-73.7	0.931	97.01	0.34	0	0.46	8.19
18	1504	17.5	7.13	-73.5	0.932	98.3	0.31	0	0.46	8.46
19	1507	17.5	7.13	-72.9	0.932	101.8	0.29	0	0.46	8.73
20	1510	17.3	7.13	-73.2	0.934	97.3	0.21	0	0.46	9.00

Duplicate Sample Collected? No (Yes) (Sample ID of Duplicate) AOPC2-PFAS-F-072921-FD

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Anya

Tetra Tech, Inc.

MONITORING WELL SAMPLING FORM

Date/Time of Sample Collection: 7/29 / 1525 Project Site/Subsite: NASA ARC

Well ID: PFAS-F Sample ID: _____

Depth to Water Level: _____ ft below top of casing prior to sampling, _____ after sampling

Depth to Well Bottom: _____ ft. below top of casing

Method of Purging: Bladder Pump Peristaltic Pump

Well Diameter: 2 inch 4 inch

Total Purged _____ Liters (Max 20 L) Purge Rate goal = 0.15 Liters/Min. Actual purge rate _____ Liters/Min

PHYSIO-CHEMICAL PARAMETERS DURING PURGING

Measure-ment Number	Time	Temperature (°C)	pH	ORP (mV)	Specific Conductance (S/m)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Salinity (ppt)	Each Volume/ Total Purged (L)
Stabilization Criteria		+/- 3%	+/- 0.1	+/- 20 mV	+/- 3%	+/- 10%, when > 5 NTU	+/- 10% when > 0.5 mg/L	--	--	
1	1515	17.2	7.13	-73.1	0.935	101.6	0.19	0	0.46	9.45
2	1518	17.2	7.13	-72.9	0.935	108.2	0.18	0	0.46	9.90
3	1521	17.2	7.14	-71.6	0.935	117.7	0.18	0	0.46	10.35
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Duplicate Sample Collected? No (Yes) (Sample ID of Duplicate) _____

MS/MSD Sample Collected? (No) Yes _____

Sample Remarks (odors, colors, sediment): _____

Lock Conditions _____

Comments _____

Sample(s) Collected By: Anya

APPENDIX E
PHOTOGRAPHIC LOG



Photo 1: Utility locating on Airfield, looking toward Hangars 2 & 3. Date: 07/08/2021



Photo 2: Utility locating, Sunnyvale Golf Course. Date: 07/08/2021



Photo 3: Blocked access gate, Sunnyvale Golf Course. Date: 07/08/2021



Photo 4: Groundwater sampling, Hangar N211/N248 Date: 07/13/2021



Photo 5: Drilling new well PFAS-F, Sunnyvale Golf Course. Date: 07/15/2021



Photo 6: Completed new well PFAS-F, Sunnyvale Golf Course. Date: 07/15/2021



Photo 7: Turf damage from drilling new well, Sunnyvale Golf Course Date: 07/19/2021



Photo 8: Locating monitoring well for GW sampling near Airfield. Date: 07/27/2021

APPENDIX F
WELL SURVEY INFORMATION



GRAPHIC SCALE

500 0 250 500 1000

(IN FEET)

1 INCH = 500 FT.

LEGEND

MONITORING WELL

NOTES

1) HORIZONTAL DATUM: US STATE PLANE 1983, CALIFORNIA ZONE 3.
2) SURVEY DATA BASED UPON THE CONDITION AT THE TIME OF SURVEY PERFORMED BY F3 & ASSOCIATES ON AUGUST 18, 2021.
3) ALL UNITS SHOWN IN US SURVEY FEET AND DECIMALS.
4) ELEVATIONS ARE BASED ON NAVD 1988 VERTICAL DATUM.

MONITORING WELL TABLE (FEET)

NAME	POINT NO.	NORTHING	EASTING	TOP OF PIPE	TOP OF CASING	GROUND SHOT
PFAS-A	818000	1979387.82	6108705.90	8.94	9.68	9.53
PFAS-C	818006	1973760.90	6114836.16	28.31	28.68	28.54
PFAS-D	818013	1972511.20	6115045.26	35.03	35.45	35.27
PFAS-E	818019	1972285.75	6113467.60	39.20	39.37	39.08
PFAS-F	818015	1971216.96	6113834.07	44.64	45.10	44.98
PFAS-G	818003	1972910.75	6113455.47	36.83	37.18	37.00
PFAS-H	818009	1981630.60	6111659.88	4.44	4.72	4.57

FILE: P:\PROFESSIONAL\2021\21050-NASA AMES\AUTOCAD\21050 NASA AMES.DWG DATE: 11/20/2021

JOB NUMBER: 21050
PAGE 1 OF 1
SCALE: 1"=500'
DATE: 11/22/2021
DRAWN BY: CES
DESIGN BY: NONE

NASA AMES RESEARCH CENTER

MONITORING WELLS

CITY OF MOUNTAIN VIEW CALIFORNIA SANTA CLARA COUNTY

F3 & Associates, Inc.
LAND SURVEYING - 3D INDUSTRIAL LASER SCANNING
701 E. H ST, BENICIA , CA 94510
PHONE(707)748-4300 FAX(707)361-0295
www.F3-Inc.com

APPENDIX G
LABORATORY ANALYTICAL REPORTS

(Submitted in Electronic Copy Only)

ANALYTICAL REPORT

September 08, 2021

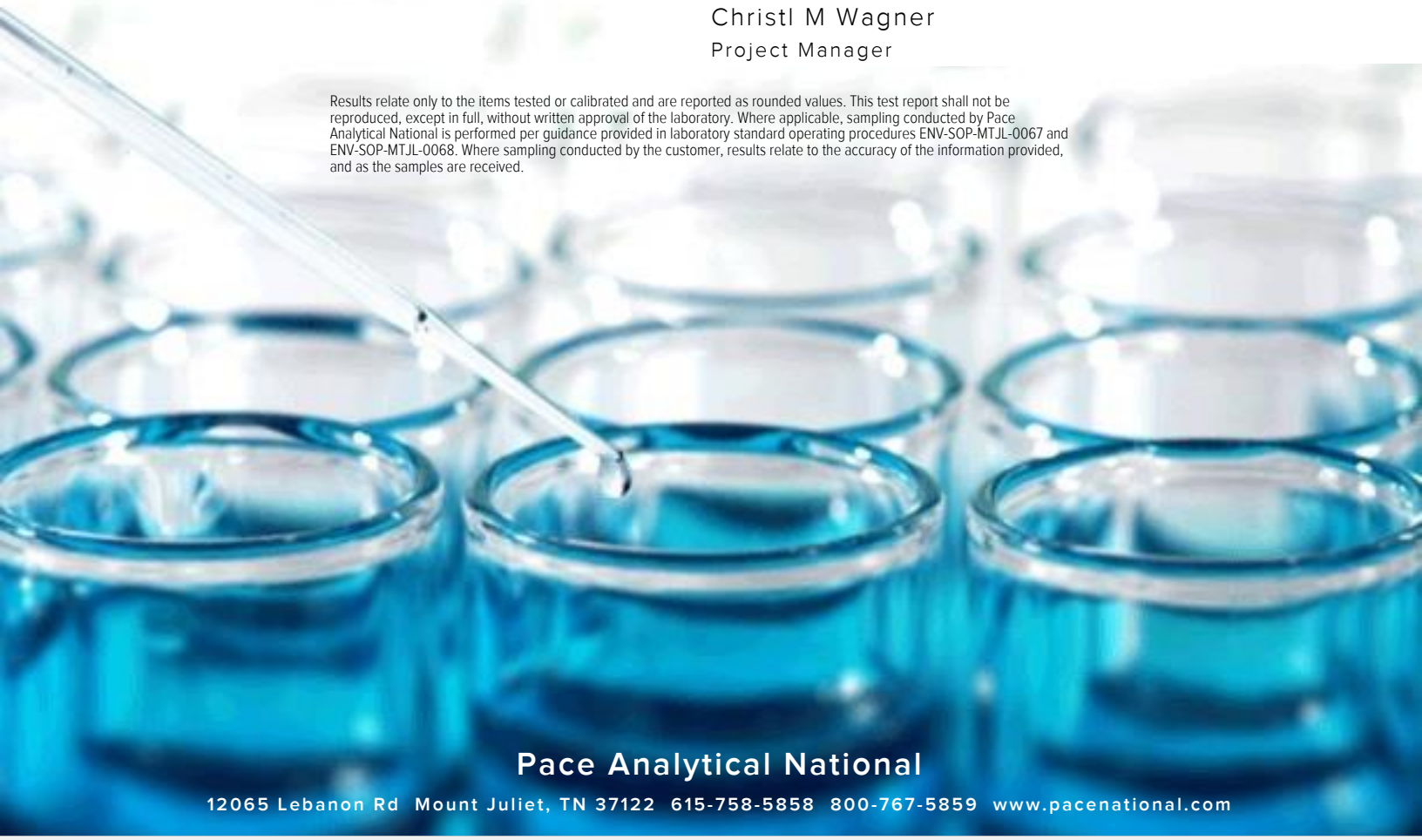
Pace Analytical - West Columbia, SC

Sample Delivery Group:	L1390235
Samples Received:	08/13/2021
Project Number:	WH13098
Description:	NASA ARC
Site:	01
Report To:	Kathy Smith 106 Vantage Point Dr. West Columbia, SC 29172

Entire Report Reviewed By:

Christl M Wagner
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

Cp: Cover Page 1

Tc: Table of Contents 2

Ss: Sample Summary 3

Cn: Case Narrative 7

Sr: Sample Results 8

IDW-GW-01-08112021 L1390235-01 8

IDW-GW-02-08112021 L1390235-02 13

IDW-GW-03-08112021 L1390235-03 18

IDW-GW-04-08112021 L1390235-04 23

IDW-GW-05-08112021 L1390235-05 28

IDW-GW-06-08112021 L1390235-06 33

IDW-GW-07-08112021 L1390235-07 38

IDW-GW-08-08112021 L1390235-08 43

IDW-GW-09-08112021 L1390235-09 48

IDW-GW-10-08112021 L1390235-10 53

IDW-GW-11-08112021 L1390235-11 58

IDW-GW-12-08112021 L1390235-12 63

Qc: Quality Control Summary 68

Wet Chemistry by Method 7196A 68

Mercury by Method 7470A 69

Metals (ICP) by Method 6010B 70

Volatile Organic Compounds (GC) by Method 8015 72

Volatile Organic Compounds (GC/MS) by Method 8260B 74

Semi-Volatile Organic Compounds (GC) by Method 3511/8015 80

Chlorinated Acid Herbicides (GC) by Method 8151 81

Pesticides (GC) by Method 8081 83

Polychlorinated Biphenyls (GC) by Method 8082 89

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM 92

Semi Volatile Organic Compounds (GC/MS) by Method 8270C 96

Gl: Glossary of Terms 101

Al: Accreditations & Locations 103

Sc: Sample Chain of Custody 104

IDW-GW-01-08112021 L1390235-01 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 10:00 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:52	08/14/21 00:52	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 09:48	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:22	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 18:20	08/14/21 18:20	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 04:25	08/20/21 04:25	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 16:51	08/24/21 16:51	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729646	1	08/25/21 21:52	08/25/21 21:52	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/18/21 01:11	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1	08/15/21 18:58	08/17/21 00:07	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1723612	1	08/17/21 22:55	08/18/21 12:56	AO	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1723612	1	08/17/21 22:55	08/18/21 21:54	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 11:51	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 14:38	TMM	Mt. Juliet, TN

IDW-GW-02-08112021 L1390235-02 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 10:20 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:52	08/14/21 00:52	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 09:51	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:25	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 18:43	08/14/21 18:43	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 04:44	08/20/21 04:44	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 17:12	08/24/21 17:12	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729646	1	08/25/21 22:13	08/25/21 22:13	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/18/21 01:37	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1	08/15/21 18:58	08/17/21 00:21	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1723612	1	08/17/21 22:55	08/20/21 07:18	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1723612	1	08/17/21 22:55	08/18/21 22:21	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 12:09	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1726247	1	08/22/21 01:37	08/22/21 12:59	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 14:59	TMM	Mt. Juliet, TN

IDW-GW-03-08112021 L1390235-03 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 10:40 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:52	08/14/21 00:52	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 09:53	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:28	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1726490	200	08/20/21 16:50	08/20/21 16:50	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 05:03	08/20/21 05:03	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 17:32	08/24/21 17:32	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729646	1	08/25/21 22:33	08/25/21 22:33	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/18/21 02:03	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1	08/15/21 18:58	08/17/21 00:36	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1727077	1.05	08/22/21 17:11	08/23/21 04:05	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1728813	1	08/27/21 07:10	08/29/21 18:07	MTJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 12:26	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 18:56	TMM	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

IDW-GW-04-08112021 L1390235-04 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 11:00 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:54	08/14/21 00:54	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 09:56	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:31	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 19:53	08/14/21 19:53	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 05:22	08/20/21 05:22	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 17:52	08/24/21 17:52	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729646	1	08/25/21 22:54	08/25/21 22:54	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/18/21 23:55	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1	08/15/21 18:58	08/17/21 00:50	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1727077	1	08/22/21 17:11	08/23/21 04:14	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1728813	1.19	08/27/21 07:10	08/29/21 19:59	MTJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 12:43	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 15:21	TMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/25/21 03:30	AMG	Mt. Juliet, TN

IDW-GW-05-08112021 L1390235-05 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 11:20 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:54	08/14/21 00:54	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 09:58	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:39	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 20:16	08/14/21 20:16	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 05:41	08/20/21 05:41	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 18:13	08/24/21 18:13	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729646	1	08/25/21 23:15	08/25/21 23:15	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/19/21 00:21	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1.05	08/15/21 18:58	08/17/21 01:05	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1727077	1.04	08/22/21 17:11	08/23/21 04:22	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1728813	1	08/27/21 07:10	08/29/21 20:24	MTJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 13:01	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1726247	1	08/22/21 01:37	08/22/21 13:59	ADF	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 15:42	TMM	Mt. Juliet, TN

IDW-GW-06-08112021 L1390235-06 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 11:40 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:54	08/14/21 00:54	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 10:00	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:42	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 20:39	08/14/21 20:39	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 06:00	08/20/21 06:00	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 18:33	08/24/21 18:33	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729646	1	08/25/21 23:35	08/25/21 23:35	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/19/21 00:47	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1	08/15/21 18:58	08/17/21 01:19	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1727077	1	08/22/21 17:11	08/23/21 04:31	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1728813	1	08/27/21 07:10	08/29/21 20:36	MTJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 16:29	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1726247	1	08/22/21 01:37	08/22/21 14:19	ADF	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 16:03	TMM	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

IDW-GW-07-08112021 L1390235-07 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 12:00 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:55	08/14/21 00:55	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 10:03	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:45	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 21:03	08/14/21 21:03	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 06:19	08/20/21 06:19	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 18:54	08/24/21 18:54	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729598	1	08/25/21 21:44	08/25/21 21:44	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/19/21 01:13	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1	08/15/21 18:58	08/17/21 01:34	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1727077	1	08/22/21 17:11	08/23/21 04:40	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1728813	1	08/27/21 07:10	08/29/21 20:48	MTJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 13:18	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1726247	1	08/22/21 01:37	08/22/21 14:39	ADF	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 16:25	TMM	Mt. Juliet, TN

IDW-GW-08-08112021 L1390235-08 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 12:20 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:55	08/14/21 00:55	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 10:10	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:48	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 21:26	08/14/21 21:26	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 06:38	08/20/21 06:38	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 19:14	08/24/21 19:14	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729598	1	08/25/21 22:04	08/25/21 22:04	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/19/21 01:40	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1	08/15/21 18:58	08/17/21 01:49	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1727077	1.01	08/22/21 17:11	08/23/21 04:49	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1728813	1	08/27/21 07:10	08/29/21 21:01	MTJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 13:36	LEA	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 16:46	TMM	Mt. Juliet, TN

IDW-GW-09-08112021 L1390235-09 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 12:40 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:57	08/14/21 00:57	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 10:13	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:51	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 21:49	08/14/21 21:49	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 06:57	08/20/21 06:57	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 19:34	08/24/21 19:34	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729598	1	08/25/21 22:25	08/25/21 22:25	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/19/21 02:06	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1.11	08/15/21 18:58	08/17/21 02:47	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1724084	1	08/18/21 05:48	08/18/21 16:34	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1726770	1	08/20/21 22:16	08/21/21 21:48	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 16:47	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1726247	1	08/22/21 01:37	08/22/21 14:59	ADF	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 17:08	TMM	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

IDW-GW-10-08112021 L1390235-10 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 10:00 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:57	08/14/21 00:57	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 10:15	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:54	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 22:12	08/14/21 22:12	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 07:16	08/20/21 07:16	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 19:55	08/24/21 19:55	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729598	1	08/25/21 22:45	08/25/21 22:45	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/19/21 02:32	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1.05	08/15/21 18:58	08/17/21 03:01	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1724084	1	08/18/21 05:48	08/18/21 16:43	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1726770	1	08/20/21 22:16	08/21/21 21:57	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 17:04	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1726247	1	08/22/21 01:37	08/22/21 15:19	ADF	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 17:30	TMM	Mt. Juliet, TN

IDW-GW-11-08112021 L1390235-11 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 10:00 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:57	08/14/21 00:57	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 10:18	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	1	08/18/21 16:50	08/20/21 09:57	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 22:35	08/14/21 22:35	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 07:35	08/20/21 07:35	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 20:15	08/24/21 20:15	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729598	1	08/25/21 23:05	08/25/21 23:05	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/19/21 02:58	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1	08/15/21 18:58	08/17/21 03:16	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1724084	1	08/18/21 05:48	08/18/21 16:52	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1726770	1	08/20/21 22:16	08/21/21 22:06	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 17:21	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1726247	1	08/22/21 01:37	08/22/21 15:39	ADF	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 17:51	TMM	Mt. Juliet, TN

IDW-GW-12-08112021 L1390235-12 GW

Collected by: Callie Neaves | Collected date/time: 08/11/21 10:00 | Received date/time: 08/13/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1723000	1	08/14/21 00:57	08/14/21 00:57	ARM	Mt. Juliet, TN
Mercury by Method 7470A	WG1724045	1	08/17/21 16:47	08/18/21 10:20	SD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1724277	5	08/18/21 16:50	08/20/21 14:24	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1723166	1	08/14/21 22:58	08/14/21 22:58	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1725112	1	08/20/21 07:54	08/20/21 07:54	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1728438	1	08/24/21 20:35	08/24/21 20:35	GLN	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1729598	1	08/25/21 23:26	08/25/21 23:26	GLN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1724076	1	08/17/21 15:59	08/19/21 03:24	JDG	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151	WG1722886	1.25	08/15/21 18:58	08/17/21 03:30	AO	Mt. Juliet, TN
Pesticides (GC) by Method 8081	WG1724084	1	08/18/21 05:48	08/18/21 17:00	JMB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1726770	1	08/20/21 22:16	08/21/21 22:15	AMM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1723610	1	08/17/21 21:53	08/18/21 17:39	AAT	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM	WG1726247	1	08/22/21 01:37	08/22/21 15:59	ADF	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1724081	1	08/18/21 02:32	08/18/21 19:18	TMM	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Christl M Wagner
Project Manager

Wet Chemistry by Method 7196A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:52	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 09:48	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:22	WG1724277
Arsenic	7440-38-2	5.00	U	4.40	5.00	10.0	1	08/20/2021 09:22	WG1724277
Barium	7440-39-3	75.3		0.736	2.50	5.00	1	08/20/2021 09:22	WG1724277
Beryllium	7440-41-7	1.00	U	0.330	1.00	2.00	1	08/20/2021 09:22	WG1724277
Cadmium	7440-43-9	1.76	J	0.479	1.00	2.00	1	08/20/2021 09:22	WG1724277
Calcium	7440-70-2	159000		79.3	500	1000	1	08/20/2021 09:22	WG1724277
Chromium	7440-47-3	5.00	U	1.40	5.00	10.0	1	08/20/2021 09:22	WG1724277
Cobalt	7440-48-4	0.990	J	0.840	5.00	10.0	1	08/20/2021 09:22	WG1724277
Copper	7440-50-8	8.75	J	3.68	5.00	10.0	1	08/20/2021 09:22	WG1724277
Lead	7439-92-1	2.50	U	2.99	2.50	6.00	1	08/20/2021 09:22	WG1724277
Molybdenum	7439-98-7	4.58	J	1.16	2.50	5.00	1	08/20/2021 09:22	WG1724277
Nickel	7440-02-0	5.16	J	1.61	5.00	10.0	1	08/20/2021 09:22	WG1724277
Selenium	7782-49-2	8.00	U	7.35	8.00	10.0	1	08/20/2021 09:22	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:22	WG1724277
Thallium	7440-28-0	5.00	U	4.31	5.00	10.0	1	08/20/2021 09:22	WG1724277
Vanadium	7440-62-2	10.0	U	4.99	10.0	20.0	1	08/20/2021 09:22	WG1724277
Zinc	7440-66-6	20.1	J	6.52	25.0	50.0	1	08/20/2021 09:22	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
TPHG C5 - C12	TPHG C5 - C12	32.8	B J	30.4	50.0	100	1	08/14/2021 18:20	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*108*				*62.0-128*		*08/14/2021 18:20*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	08/25/2021 21:52	WG1729646
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 04:25	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 04:25	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 04:25	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 04:25	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 04:25	WG1725112
Carbon disulfide	75-15-0	0.500	U	0.0962	0.500	1.00	1	08/20/2021 04:25	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 16:51	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 04:25	WG1725112
Chloroform	67-66-3	0.240	J	0.111	2.00	5.00	1	08/20/2021 04:25	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 04:25	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 04:25	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 04:25	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 04:25	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 04:25	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 04:25	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 04:25	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 04:25	WG1725112
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	08/20/2021 04:25	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 04:25	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 04:25	WG1725112
cis-1,2-Dichloroethene	156-59-2	0.486	J	0.126	0.500	1.00	1	08/20/2021 04:25	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 04:25	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 04:25	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 04:25	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 04:25	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 04:25	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 16:51	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 04:25	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 04:25	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 16:51	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 04:25	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 04:25	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 04:25	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 04:25	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 04:25	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 04:25	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 04:25	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 04:25	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 04:25	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 04:25	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 04:25	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 04:25	WG1725112
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	08/20/2021 04:25	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 04:25	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 16:51	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 04:25	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 04:25	WG1725112
(S) Toluene-d8	*2037-26-5*	*106*				*89.0-112*		*08/20/2021 04:25*	WG1725112
(S) Toluene-d8	*2037-26-5*	*111*				*89.0-112*		*08/24/2021 16:51*	WG1728438
(S) Toluene-d8	*2037-26-5*	*97.4*				*89.0-112*		*08/25/2021 21:52*	WG1729646
(S) 4-Bromofluorobenzene	*460-00-4*	*101*				*85.0-114*		*08/20/2021 04:25*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*100*				*85.0-114*		*08/24/2021 16:51*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*99.1*				*85.0-114*		*08/25/2021 21:52*	WG1729646
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*104*				*81.0-118*		*08/20/2021 04:25*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*103*				*81.0-118*		*08/24/2021 16:51*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*106*				*81.0-118*		*08/25/2021 21:52*	WG1729646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	197		33.0	50.0	100	1	08/18/2021 01:11	WG1724076
C22-C32 Hydrocarbons	C22-C32	102		33.0	50.0	100	1	08/18/2021 01:11	WG1724076
C32-C40 Hydrocarbons	C32-C40	50.0	U	33.0	50.0	100	1	08/18/2021 01:11	WG1724076
(S) o-Terphenyl	*84-15-1*	*68.4*				*52.0-156*		*08/18/2021 01:11*	WG1724076

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.00	U	0.547	1.00	2.00	1	08/17/2021 00:07	WG1722886
Dalapon	75-99-0	1.00	U	0.344	1.00	2.00	1	08/17/2021 00:07	WG1722886
2,4-DB	94-82-6	1.00	U	0.302	1.00	2.00	1	08/17/2021 00:07	WG1722886
Dicamba	1918-00-9	1.00	U	0.245	1.00	2.00	1	08/17/2021 00:07	WG1722886
Dichloroprop	120-36-5	1.04	U	1.04	1.04	2.00	1	08/17/2021 00:07	WG1722886
Dinoseb	88-85-7	1.00	U	0.250	1.00	2.00	1	08/17/2021 00:07	WG1722886
MCPA	94-74-6	50.0	J4 U	13.1	50.0	100	1	08/17/2021 00:07	WG1722886
MCPP	93-65-2	66.0	U	66.0	66.0	100	1	08/17/2021 00:07	WG1722886
2,4,5-T	93-76-5	1.00	U	0.258	1.00	2.00	1	08/17/2021 00:07	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.00	U	0.335	1.00	2.00	1	08/17/2021 00:07	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*55.0*				*32.0-138*		*08/17/2021 00:07*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0250	U	0.0198	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Alpha BHC	319-84-6	0.0250	U	0.0172	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Beta BHC	319-85-7	0.0250	U	0.0208	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Delta BHC	319-86-8	0.0250	U	0.0150	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Gamma BHC	58-89-9	0.0250	U	0.0209	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Chlordane	57-74-9	0.250	U	0.0198	0.250	5.00	1	08/18/2021 12:56	WG1723612
4,4-DDD	72-54-8	0.0250	U	0.0177	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
4,4-DDE	72-55-9	0.0250	U	0.0154	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
4,4-DDT	50-29-3	0.0250	U	0.0198	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Dieldrin	60-57-1	0.0250	U	0.0162	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Endosulfan I	959-98-8	0.0250	U	0.0160	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Endosulfan II	33213-65-9	0.0250	U	0.0164	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Endosulfan sulfate	1031-07-8	0.0250	U	0.0217	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Endrin	72-20-8	0.0250	U	0.0161	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Endrin aldehyde	7421-93-4	0.0250	U	0.0237	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Endrin ketone	53494-70-5	0.0250	J4 U	0.0219	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Heptachlor	76-44-8	0.0250	U	0.0148	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Heptachlor epoxide	1024-57-3	0.0250	U	0.0183	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Hexachlorobenzene	118-74-1	0.0250	U	0.0176	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Methoxychlor	72-43-5	0.0250	J4 U	0.0193	0.0250	0.0500	1	08/18/2021 12:56	WG1723612
Toxaphene	8001-35-2	0.250	U	0.168	0.250	0.500	1	08/18/2021 12:56	WG1723612
(S) Decachlorobiphenyl	*2051-24-3*	*181*	J1			*10.0-156*		*08/18/2021 12:56*	WG1723612
(S) Tetrachloro-m-xylene	*877-09-8*	*114*				*44.0-124*		*08/18/2021 12:56*	WG1723612

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	J5 U	0.270	0.270	0.500	1	08/18/2021 21:54	WG1723612
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/18/2021 21:54	WG1723612
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/18/2021 21:54	WG1723612
PCB 1242	53469-21-9	0.270	U	0.270	0.270	0.500	1	08/18/2021 21:54	WG1723612
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/18/2021 21:54	WG1723612
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/18/2021 21:54	WG1723612
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/18/2021 21:54	WG1723612
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/18/2021 21:54	WG1723612
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/18/2021 21:54	WG1723612
(S) Decachlorobiphenyl	*2051-24-3*	*71.2*				*10.0-156*		*08/18/2021 21:54*	WG1723612
(S) Tetrachloro-m-xylene	*877-09-8*	*81.1*				*44.0-124*		*08/18/2021 21:54*	WG1723612

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Benzo(a)anthracene	56-55-3	0.0250	U	0.0200	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Benzo(a)pyrene	50-32-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Benzo(k)fluoranthene	207-08-9	0.125	U	0.0200	0.125	0.250	1	08/18/2021 11:51	WG1723610
Chrysene	218-01-9	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Dibenz(a,h)anthracene	53-70-3	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Fluoranthene	206-44-0	0.0250	U	0.0110	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 11:51	WG1723610
Phenanthrene	85-01-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
Pyrene	129-00-0	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 11:51	WG1723610
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 11:51	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 11:51	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*68.5*				*55.0-111*		*08/18/2021 11:51*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*55.5*				*53.0-106*		*08/18/2021 11:51*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*29.1*	J2			*58.0-132*		*08/18/2021 11:51*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*54.0*				*50.0-150*		*08/18/2021 11:51*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*16.3*	J2			*50.0-150*		*08/18/2021 11:51*	WG1723610

Sample Narrative:

L1390235-01 WG1723610: Duplicate Analysis performed due to surrogate failure. Results confirm; reporting in hold data

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 14:38	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 14:38	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 14:38	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 14:38	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 14:38	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 14:38	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 14:38	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 14:38	WG1724081
Caprolactam	105-60-2	5.00	U	0.309	5.00	10.0	1	08/18/2021 14:38	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 14:38	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 14:38	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 14:38	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 14:38	WG1724081
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 14:38	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 14:38	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 14:38	WG1724081
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 14:38	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 14:38	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 14:38	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 14:38	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 14:38	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 14:38	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 14:38	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 14:38	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 14:38	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 14:38	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 14:38	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 14:38	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 14:38	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 14:38	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 14:38	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 14:38	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 14:38	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 14:38	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 14:38	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 14:38	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 14:38	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 14:38	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 14:38	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 14:38	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 14:38	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 14:38	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 14:38	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 14:38	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 14:38	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 14:38	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 14:38	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*44.4*				*19.0-119*		*08/18/2021 14:38*	WG1724081
(S) Phenol-d5	*4165-62-2*	*31.6*				*10.0-67.0*		*08/18/2021 14:38*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*61.3*				*44.0-120*		*08/18/2021 14:38*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*62.4*				*44.0-119*		*08/18/2021 14:38*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*71.5*				*43.0-140*		*08/18/2021 14:38*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*59.1*				*50.0-134*		*08/18/2021 14:38*	WG1724081

Wet Chemistry by Method 7196A

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:52	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 09:51	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:25	WG1724277
Arsenic	7440-38-2	5.00	U	4.40	5.00	10.0	1	08/20/2021 09:25	WG1724277
Barium	7440-39-3	94.2		0.736	2.50	5.00	1	08/20/2021 09:25	WG1724277
Beryllium	7440-41-7	1.00	U	0.330	1.00	2.00	1	08/20/2021 09:25	WG1724277
Cadmium	7440-43-9	1.22	J	0.479	1.00	2.00	1	08/20/2021 09:25	WG1724277
Calcium	7440-70-2	195000		79.3	500	1000	1	08/20/2021 09:25	WG1724277
Chromium	7440-47-3	1.76	J	1.40	5.00	10.0	1	08/20/2021 09:25	WG1724277
Cobalt	7440-48-4	5.00	U	0.840	5.00	10.0	1	08/20/2021 09:25	WG1724277
Copper	7440-50-8	4.35	J	3.68	5.00	10.0	1	08/20/2021 09:25	WG1724277
Lead	7439-92-1	2.50	U	2.99	2.50	6.00	1	08/20/2021 09:25	WG1724277
Molybdenum	7439-98-7	4.31	J	1.16	2.50	5.00	1	08/20/2021 09:25	WG1724277
Nickel	7440-02-0	6.53	J	1.61	5.00	10.0	1	08/20/2021 09:25	WG1724277
Selenium	7782-49-2	15.5		7.35	8.00	10.0	1	08/20/2021 09:25	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:25	WG1724277
Thallium	7440-28-0	7.53	J	4.31	5.00	10.0	1	08/20/2021 09:25	WG1724277
Vanadium	7440-62-2	10.0	U	4.99	10.0	20.0	1	08/20/2021 09:25	WG1724277
Zinc	7440-66-6	19.5	J	6.52	25.0	50.0	1	08/20/2021 09:25	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
TPHG C5 - C12	TPHG C5 - C12	41.3	B J	30.4	50.0	100	1	08/14/2021 18:43	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*107*				*62.0-128*		*08/14/2021 18:43*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	08/25/2021 22:13	WG1729646
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 04:44	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 04:44	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 04:44	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 04:44	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 04:44	WG1725112
Carbon disulfide	75-15-0	0.500	U	0.0962	0.500	1.00	1	08/20/2021 04:44	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 17:12	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 04:44	WG1725112
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	08/20/2021 04:44	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 04:44	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 04:44	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 04:44	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 04:44	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 04:44	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 04:44	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 04:44	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 04:44	WG1725112
1,1-Dichloroethane	75-34-3	0.313	J	0.100	0.500	1.00	1	08/20/2021 04:44	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 04:44	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 04:44	WG1725112
cis-1,2-Dichloroethene	156-59-2	10.6		0.126	0.500	1.00	1	08/20/2021 04:44	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 04:44	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 04:44	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 04:44	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 04:44	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 04:44	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 17:12	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 04:44	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 04:44	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 17:12	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 04:44	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 04:44	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 04:44	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 04:44	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 04:44	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 04:44	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 04:44	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 04:44	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 04:44	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 04:44	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 04:44	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 04:44	WG1725112
Trichloroethene	79-01-6	3.02		0.190	0.500	1.00	1	08/20/2021 04:44	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 04:44	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 17:12	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 04:44	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 04:44	WG1725112
(S) Toluene-d8	*2037-26-5*	*107*				*89.0-112*		*08/20/2021 04:44*	WG1725112
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*08/24/2021 17:12*	WG1728438
(S) Toluene-d8	*2037-26-5*	*94.8*				*89.0-112*		*08/25/2021 22:13*	WG1729646
(S) 4-Bromofluorobenzene	*460-00-4*	*101*				*85.0-114*		*08/20/2021 04:44*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*97.3*				*85.0-114*		*08/24/2021 17:12*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*97.8*				*85.0-114*		*08/25/2021 22:13*	WG1729646
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*103*				*81.0-118*		*08/20/2021 04:44*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*98.7*				*81.0-118*		*08/24/2021 17:12*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*110*				*81.0-118*		*08/25/2021 22:13*	WG1729646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	58.0	J	33.0	50.0	100	1	08/18/2021 01:37	WG1724076
C22-C32 Hydrocarbons	C22-C32	50.0	U	33.0	50.0	100	1	08/18/2021 01:37	WG1724076
C32-C40 Hydrocarbons	C32-C40	50.0	U	33.0	50.0	100	1	08/18/2021 01:37	WG1724076
(S) o-Terphenyl	*84-15-1*	*67.9*				*52.0-156*		*08/18/2021 01:37*	WG1724076

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.00	U	0.547	1.00	2.00	1	08/17/2021 00:21	WG1722886
Dalapon	75-99-0	1.00	U	0.344	1.00	2.00	1	08/17/2021 00:21	WG1722886
2,4-DB	94-82-6	1.00	U	0.302	1.00	2.00	1	08/17/2021 00:21	WG1722886
Dicamba	1918-00-9	1.00	U	0.245	1.00	2.00	1	08/17/2021 00:21	WG1722886
Dichloroprop	120-36-5	1.04	U	1.04	1.04	2.00	1	08/17/2021 00:21	WG1722886
Dinoseb	88-85-7	1.00	U	0.250	1.00	2.00	1	08/17/2021 00:21	WG1722886
MCPA	94-74-6	50.0	J4 U	13.1	50.0	100	1	08/17/2021 00:21	WG1722886
MCPP	93-65-2	66.0	U	66.0	66.0	100	1	08/17/2021 00:21	WG1722886
2,4,5-T	93-76-5	1.00	U	0.258	1.00	2.00	1	08/17/2021 00:21	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.00	U	0.335	1.00	2.00	1	08/17/2021 00:21	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*70.0*				*32.0-138*		*08/17/2021 00:21*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0250	U	0.0198	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Alpha BHC	319-84-6	0.0250	U	0.0172	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Beta BHC	319-85-7	0.0250	U	0.0208	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Delta BHC	319-86-8	0.0250	U	0.0150	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Gamma BHC	58-89-9	0.0250	U	0.0209	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Chlordane	57-74-9	0.250	U	0.0198	0.250	5.00	1	08/20/2021 07:18	WG1723612
4,4-DDD	72-54-8	0.0250	U	0.0177	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
4,4-DDE	72-55-9	0.0250	U	0.0154	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
4,4-DDT	50-29-3	0.0250	U	0.0198	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Dieldrin	60-57-1	0.0250	U	0.0162	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Endosulfan I	959-98-8	0.0250	U	0.0160	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Endosulfan II	33213-65-9	0.0250	U	0.0164	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Endosulfan sulfate	1031-07-8	0.0250	U	0.0217	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Endrin	72-20-8	0.0250	U	0.0161	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Endrin aldehyde	7421-93-4	0.0250	U	0.0237	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Endrin ketone	53494-70-5	0.0250	J4 U	0.0219	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Heptachlor	76-44-8	0.0250	U	0.0148	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Heptachlor epoxide	1024-57-3	0.0250	U	0.0183	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Hexachlorobenzene	118-74-1	0.0250	U	0.0176	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Methoxychlor	72-43-5	0.0250	J4 U	0.0193	0.0250	0.0500	1	08/20/2021 07:18	WG1723612
Toxaphene	8001-35-2	0.250	U	0.168	0.250	0.500	1	08/20/2021 07:18	WG1723612
(S) Decachlorobiphenyl	*2051-24-3*	*67.0*				*10.0-156*		*08/20/2021 07:18*	WG1723612
(S) Tetrachloro-m-xylene	*877-09-8*	*59.1*				*44.0-124*		*08/20/2021 07:18*	WG1723612

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	U	0.270	0.270	0.500	1	08/18/2021 22:21	WG1723612
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/18/2021 22:21	WG1723612
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/18/2021 22:21	WG1723612
PCB 1242	53469-21-9	0.270	U	0.270	0.270	0.500	1	08/18/2021 22:21	WG1723612
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/18/2021 22:21	WG1723612
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/18/2021 22:21	WG1723612
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/18/2021 22:21	WG1723612
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/18/2021 22:21	WG1723612
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/18/2021 22:21	WG1723612
(S) Decachlorobiphenyl	*2051-24-3*	*76.3*				*10.0-156*		*08/18/2021 22:21*	WG1723612
(S) Tetrachloro-m-xylene	*877-09-8*	*67.9*				*44.0-124*		*08/18/2021 22:21*	WG1723612

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Benzo(a)anthracene	56-55-3	0.0250	U	0.0200	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Benzo(a)pyrene	50-32-8	0.0215	B J	0.0180	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Benzo(a)pyrene	50-32-8	0.0909	B Q	0.0180	0.0250	0.0500	1	08/22/2021 12:59	WG1726247
Benzo(b)fluoranthene	205-99-2	0.0236	B J	0.0170	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0878	B Q	0.0170	0.0250	0.0500	1	08/22/2021 12:59	WG1726247
Benzo(g,h,i)perylene	191-24-2	0.0357	B J	0.0180	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.138	B Q	0.0180	0.0250	0.0500	1	08/22/2021 12:59	WG1726247
Benzo(k)fluoranthene	207-08-9	0.0208	B J	0.0200	0.125	0.250	1	08/18/2021 12:09	WG1723610
Chrysene	218-01-9	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Dibenz(a,h)anthracene	53-70-3	0.0261	B J	0.0180	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Dibenz(a,h)anthracene	53-70-3	0.134	Q	0.0180	0.0250	0.0500	1	08/22/2021 12:59	WG1726247
Fluoranthene	206-44-0	0.0155	J	0.0110	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0326	B J	0.0180	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.138	B Q	0.0180	0.0250	0.0500	1	08/22/2021 12:59	WG1726247
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 12:09	WG1723610
Phenanthrene	85-01-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
Pyrene	129-00-0	0.0184	B J	0.0170	0.0250	0.0500	1	08/18/2021 12:09	WG1723610
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 12:09	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 12:09	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*51.0*	J2			*55.0-111*		*08/18/2021 12:09*	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*62.0*				*55.0-111*		*08/22/2021 12:59*	WG1726247
(S) 2-Fluorobiphenyl	*321-60-8*	*31.3*	J2			*53.0-106*		*08/18/2021 12:09*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*45.8*	J2			*53.0-106*		*08/22/2021 12:59*	WG1726247
(S) p-Terphenyl-d14	*1718-51-0*	*33.0*	J2			*58.0-132*		*08/18/2021 12:09*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*51.5*	J2			*58.0-132*		*08/22/2021 12:59*	WG1726247
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*30.8*	J2			*50.0-150*		*08/18/2021 12:09*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*45.6*	J2			*50.0-150*		*08/22/2021 12:59*	WG1726247
(S) Fluoranthene-D10	*93951-69-0*	*23.5*	J2			*50.0-150*		*08/18/2021 12:09*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*40.1*	J2			*50.0-150*		*08/22/2021 12:59*	WG1726247

Sample Narrative:

L1390235-02 WG1723610, WG1726247: Duplicate Analysis performed due to surrogate failure. Results don't confirm; both analyses reported

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 14:59	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 14:59	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 14:59	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 14:59	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 14:59	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 14:59	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 14:59	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 14:59	WG1724081
Caprolactam	105-60-2	0.900	J	0.309	5.00	10.0	1	08/18/2021 14:59	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 14:59	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 14:59	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 14:59	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 14:59	WG1724081
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 14:59	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 14:59	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 14:59	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 14:59	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 14:59	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 14:59	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 14:59	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 14:59	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 14:59	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 14:59	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 14:59	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 14:59	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 14:59	WG1724081
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 14:59	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 14:59	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 14:59	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 14:59	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 14:59	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 14:59	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 14:59	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 14:59	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 14:59	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 14:59	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 14:59	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 14:59	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 14:59	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 14:59	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 14:59	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 14:59	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 14:59	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 14:59	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 14:59	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 14:59	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 14:59	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*41.9*				*19.0-119*		*08/18/2021 14:59*	WG1724081
(S) Phenol-d5	*4165-62-2*	*31.9*				*10.0-67.0*		*08/18/2021 14:59*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*57.2*				*44.0-120*		*08/18/2021 14:59*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*58.7*				*44.0-119*		*08/18/2021 14:59*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*66.0*				*43.0-140*		*08/18/2021 14:59*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*55.8*				*50.0-134*		*08/18/2021 14:59*	WG1724081

Wet Chemistry by Method 7196A

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:52	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 09:53	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:28	WG1724277
Arsenic	7440-38-2	5.00	U	4.40	5.00	10.0	1	08/20/2021 09:28	WG1724277
Barium	7440-39-3	60.4		0.736	2.50	5.00	1	08/20/2021 09:28	WG1724277
Beryllium	7440-41-7	1.00	U	0.330	1.00	2.00	1	08/20/2021 09:28	WG1724277
Cadmium	7440-43-9	1.19	J	0.479	1.00	2.00	1	08/20/2021 09:28	WG1724277
Calcium	7440-70-2	138000		79.3	500	1000	1	08/20/2021 09:28	WG1724277
Chromium	7440-47-3	5.00	U	1.40	5.00	10.0	1	08/20/2021 09:28	WG1724277
Cobalt	7440-48-4	5.00	U	0.840	5.00	10.0	1	08/20/2021 09:28	WG1724277
Copper	7440-50-8	5.65	J	3.68	5.00	10.0	1	08/20/2021 09:28	WG1724277
Lead	7439-92-1	2.50	U	2.99	2.50	6.00	1	08/20/2021 09:28	WG1724277
Molybdenum	7439-98-7	4.68	J	1.16	2.50	5.00	1	08/20/2021 09:28	WG1724277
Nickel	7440-02-0	4.00	J	1.61	5.00	10.0	1	08/20/2021 09:28	WG1724277
Selenium	7782-49-2	8.00	U	7.35	8.00	10.0	1	08/20/2021 09:28	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:28	WG1724277
Thallium	7440-28-0	5.00	U	4.31	5.00	10.0	1	08/20/2021 09:28	WG1724277
Vanadium	7440-62-2	10.0	U	4.99	10.0	20.0	1	08/20/2021 09:28	WG1724277
Zinc	7440-66-6	37.1	J	6.52	25.0	50.0	1	08/20/2021 09:28	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
TPHG C5 - C12	TPHG C5 - C12	10000	U	6080	10000	20000	200	08/20/2021 16:50	WG1726490
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*95.6*				*62.0-128*		*08/20/2021 16:50*	WG1726490

Sample Narrative:

L1390235-03 WG1726490: Lowest possible dilution due to sample foaming.

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	08/25/2021 22:33	WG1729646
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 05:03	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 05:03	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 05:03	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 05:03	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 05:03	WG1725112
Carbon disulfide	75-15-0	0.500	U	0.0962	0.500	1.00	1	08/20/2021 05:03	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 17:32	WG1728438
Chlorobenzene	108-90-7	0.684	J	0.116	0.500	1.00	1	08/20/2021 05:03	WG1725112
Chloroform	67-66-3	0.233	J	0.111	2.00	5.00	1	08/20/2021 05:03	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 05:03	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 05:03	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 05:03	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 05:03	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 05:03	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 05:03	WG1725112
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 05:03	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 05:03	WG1725112
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	08/20/2021 05:03	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 05:03	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 05:03	WG1725112
cis-1,2-Dichloroethene	156-59-2	1.08		0.126	0.500	1.00	1	08/20/2021 05:03	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 05:03	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 05:03	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 05:03	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 05:03	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 05:03	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 17:32	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 05:03	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 05:03	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 17:32	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 05:03	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 05:03	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 05:03	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 05:03	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 05:03	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 05:03	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 05:03	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 05:03	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 05:03	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 05:03	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 05:03	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 05:03	WG1725112
Trichloroethene	79-01-6	0.209	J	0.190	0.500	1.00	1	08/20/2021 05:03	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 05:03	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 17:32	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 05:03	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 05:03	WG1725112
(S) Toluene-d8	*2037-26-5*	*107*				*89.0-112*		*08/20/2021 05:03*	WG1725112
(S) Toluene-d8	*2037-26-5*	*107*				*89.0-112*		*08/24/2021 17:32*	WG1728438
(S) Toluene-d8	*2037-26-5*	*93.1*				*89.0-112*		*08/25/2021 22:33*	WG1729646
(S) 4-Bromofluorobenzene	*460-00-4*	*103*				*85.0-114*		*08/20/2021 05:03*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*98.9*				*85.0-114*		*08/24/2021 17:32*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*93.6*				*85.0-114*		*08/25/2021 22:33*	WG1729646
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*105*				*81.0-118*		*08/20/2021 05:03*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*104*				*81.0-118*		*08/24/2021 17:32*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*106*				*81.0-118*		*08/25/2021 22:33*	WG1729646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	692		33.0	50.0	100	1	08/18/2021 02:03	WG1724076
C22-C32 Hydrocarbons	C22-C32	1850		33.0	50.0	100	1	08/18/2021 02:03	WG1724076
C32-C40 Hydrocarbons	C32-C40	220		33.0	50.0	100	1	08/18/2021 02:03	WG1724076
(S) o-Terphenyl	*84-15-1*	*47.6*	J2			*52.0-156*		*08/18/2021 02:03*	WG1724076

Sample Narrative:

L1390235-03 WG1724076: Surrogate failure due to matrix interference

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.00	U	0.547	1.00	2.00	1	08/17/2021 00:36	WG1722886
Dalapon	75-99-0	1.00	U	0.344	1.00	2.00	1	08/17/2021 00:36	WG1722886
2,4-DB	94-82-6	1.00	U	0.302	1.00	2.00	1	08/17/2021 00:36	WG1722886
Dicamba	1918-00-9	1.00	U	0.245	1.00	2.00	1	08/17/2021 00:36	WG1722886
Dichloroprop	120-36-5	1.04	U	1.04	1.04	2.00	1	08/17/2021 00:36	WG1722886
Dinoseb	88-85-7	1.00	U	0.250	1.00	2.00	1	08/17/2021 00:36	WG1722886
MCPA	94-74-6	50.0	J4 U	13.1	50.0	100	1	08/17/2021 00:36	WG1722886
MCPP	93-65-2	66.0	U	66.0	66.0	100	1	08/17/2021 00:36	WG1722886
2,4,5-T	93-76-5	1.00	U	0.258	1.00	2.00	1	08/17/2021 00:36	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.00	U	0.335	1.00	2.00	1	08/17/2021 00:36	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*66.8*				*32.0-138*		*08/17/2021 00:36*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0263	U	0.0208	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Alpha BHC	319-84-6	0.0263	U	0.0181	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Beta BHC	319-85-7	0.0263	U	0.0218	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Delta BHC	319-86-8	0.0263	U	0.0158	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Gamma BHC	58-89-9	0.0263	U	0.0219	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Chlordane	57-74-9	0.263	U	0.0208	0.263	5.25	1.05	08/23/2021 04:05	WG1727077
4,4-DDD	72-54-8	0.0263	U	0.0186	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
4,4-DDE	72-55-9	0.0263	U	0.0162	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
4,4-DDT	50-29-3	0.0263	U	0.0208	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Dieldrin	60-57-1	0.0263	U	0.0170	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Endosulfan I	959-98-8	0.0263	U	0.0168	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Endosulfan II	33213-65-9	0.0263	U	0.0172	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Endosulfan sulfate	1031-07-8	0.0263	U	0.0228	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Endrin	72-20-8	0.0263	U	0.0169	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Endrin aldehyde	7421-93-4	0.0263	U	0.0249	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Endrin ketone	53494-70-5	0.0263	U	0.0230	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Heptachlor	76-44-8	0.0263	U	0.0155	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Heptachlor epoxide	1024-57-3	0.0263	U	0.0192	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Hexachlorobenzene	118-74-1	0.0263	U	0.0185	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Methoxychlor	72-43-5	0.0263	U	0.0203	0.0263	0.0525	1.05	08/23/2021 04:05	WG1727077
Toxaphene	8001-35-2	0.263	U	0.176	0.263	0.525	1.05	08/23/2021 04:05	WG1727077
(S) Decachlorobiphenyl	*2051-24-3*	*50.2*				*10.0-156*		*08/23/2021 04:05*	WG1727077
(S) Tetrachloro-m-xylene	*877-09-8*	*59.4*				*44.0-124*		*08/23/2021 04:05*	WG1727077

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	U	0.270	0.270	0.500	1	08/29/2021 18:07	WG1728813
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/29/2021 18:07	WG1728813
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/29/2021 18:07	WG1728813
PCB 1242	53469-21-9	0.427	J	0.270	0.270	0.500	1	08/29/2021 18:07	WG1728813
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/29/2021 18:07	WG1728813
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/29/2021 18:07	WG1728813
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/29/2021 18:07	WG1728813
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/29/2021 18:07	WG1728813
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/29/2021 18:07	WG1728813
(S) Decachlorobiphenyl	*2051-24-3*	*29.0*				*10.0-156*		*08/29/2021 18:07*	WG1728813
(S) Tetrachloro-m-xylene	*877-09-8*	*56.8*				*44.0-124*		*08/29/2021 18:07*	WG1728813

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Benzo(a)anthracene	56-55-3	0.0250	U	0.0200	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Benzo(a)pyrene	50-32-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Benzo(k)fluoranthene	207-08-9	0.125	U	0.0200	0.125	0.250	1	08/18/2021 12:26	WG1723610
Chrysene	218-01-9	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Dibenz(a,h)anthracene	53-70-3	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Fluoranthene	206-44-0	0.0250	U	0.0110	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0195	B J	0.0180	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 12:26	WG1723610
Phenanthrene	85-01-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
Pyrene	129-00-0	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 12:26	WG1723610
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 12:26	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 12:26	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*64.5*				*55.0-111*		*08/18/2021 12:26*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*42.9*	J2			*53.0-106*		*08/18/2021 12:26*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*19.6*	J2			*58.0-132*		*08/18/2021 12:26*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*46.2*	J2			*50.0-150*		*08/18/2021 12:26*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*21.9*	J2			*50.0-150*		*08/18/2021 12:26*	WG1723610

Sample Narrative:

L1390235-03 WG1723610: Duplicate Analysis performed due to surrogate failure. Results confirm; reporting in hold data

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 18:56	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 18:56	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 18:56	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 18:56	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 18:56	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 18:56	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 18:56	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 18:56	WG1724081
Caprolactam	105-60-2	5.00	U	0.309	5.00	10.0	1	08/18/2021 18:56	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 18:56	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 18:56	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 18:56	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 18:56	WG1724081
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 18:56	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 18:56	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 18:56	WG1724081
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 18:56	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 18:56	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 18:56	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 18:56	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 18:56	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 18:56	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 18:56	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 18:56	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 18:56	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 18:56	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 18:56	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 18:56	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 18:56	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 18:56	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 18:56	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 18:56	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 18:56	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 18:56	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 18:56	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 18:56	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 18:56	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 18:56	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 18:56	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 18:56	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 18:56	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 18:56	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 18:56	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 18:56	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 18:56	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 18:56	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 18:56	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*35.8*				*19.0-119*		*08/18/2021 18:56*	WG1724081
(S) Phenol-d5	*4165-62-2*	*24.7*				*10.0-67.0*		*08/18/2021 18:56*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*56.0*				*44.0-120*		*08/18/2021 18:56*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*59.8*				*44.0-119*		*08/18/2021 18:56*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*68.0*				*43.0-140*		*08/18/2021 18:56*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*59.8*				*50.0-134*		*08/18/2021 18:56*	WG1724081

Wet Chemistry by Method 7196A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:54	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 09:56	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:31	WG1724277
Arsenic	7440-38-2	5.00	U	4.40	5.00	10.0	1	08/20/2021 09:31	WG1724277
Barium	7440-39-3	15.4		0.736	2.50	5.00	1	08/20/2021 09:31	WG1724277
Beryllium	7440-41-7	1.00	U	0.330	1.00	2.00	1	08/20/2021 09:31	WG1724277
Cadmium	7440-43-9	0.950	J	0.479	1.00	2.00	1	08/20/2021 09:31	WG1724277
Calcium	7440-70-2	147000		79.3	500	1000	1	08/20/2021 09:31	WG1724277
Chromium	7440-47-3	2.11	J	1.40	5.00	10.0	1	08/20/2021 09:31	WG1724277
Cobalt	7440-48-4	5.00	U	0.840	5.00	10.0	1	08/20/2021 09:31	WG1724277
Copper	7440-50-8	5.00	U	3.68	5.00	10.0	1	08/20/2021 09:31	WG1724277
Lead	7439-92-1	2.50	U	2.99	2.50	6.00	1	08/20/2021 09:31	WG1724277
Molybdenum	7439-98-7	2.50	U	1.16	2.50	5.00	1	08/20/2021 09:31	WG1724277
Nickel	7440-02-0	5.00	U	1.61	5.00	10.0	1	08/20/2021 09:31	WG1724277
Selenium	7782-49-2	11.3		7.35	8.00	10.0	1	08/20/2021 09:31	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:31	WG1724277
Thallium	7440-28-0	5.00	U	4.31	5.00	10.0	1	08/20/2021 09:31	WG1724277
Vanadium	7440-62-2	10.0	U	4.99	10.0	20.0	1	08/20/2021 09:31	WG1724277
Zinc	7440-66-6	25.0	U	6.52	25.0	50.0	1	08/20/2021 09:31	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
TPHG C5 - C12	TPHG C5 - C12	44.5	B J	30.4	50.0	100	1	08/14/2021 19:53	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*109*				*62.0-128*		*08/14/2021 19:53*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	22.2	J	11.3	25.0	50.0	1	08/25/2021 22:54	WG1729646
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 05:22	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 05:22	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 05:22	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 05:22	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 05:22	WG1725112
Carbon disulfide	75-15-0	0.500	U	0.0962	0.500	1.00	1	08/20/2021 05:22	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 17:52	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 05:22	WG1725112
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	08/20/2021 05:22	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 05:22	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 05:22	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 05:22	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 05:22	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 05:22	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 05:22	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 05:22	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 05:22	WG1725112
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	08/20/2021 05:22	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 05:22	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 05:22	WG1725112
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	08/20/2021 05:22	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 05:22	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 05:22	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 05:22	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 05:22	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 05:22	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 17:52	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 05:22	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 05:22	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 17:52	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 05:22	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 05:22	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 05:22	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 05:22	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 05:22	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 05:22	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 05:22	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 05:22	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 05:22	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 05:22	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 05:22	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 05:22	WG1725112
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	08/20/2021 05:22	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 05:22	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 17:52	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 05:22	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 05:22	WG1725112
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*08/20/2021 05:22*	WG1725112
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*08/24/2021 17:52*	WG1728438
(S) Toluene-d8	*2037-26-5*	*92.9*				*89.0-112*		*08/25/2021 22:54*	WG1729646
(S) 4-Bromofluorobenzene	*460-00-4*	*105*				*85.0-114*		*08/20/2021 05:22*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*96.4*				*85.0-114*		*08/24/2021 17:52*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*96.3*				*85.0-114*		*08/25/2021 22:54*	WG1729646
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*107*				*81.0-118*		*08/20/2021 05:22*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*104*				*81.0-118*		*08/24/2021 17:52*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*106*				*81.0-118*		*08/25/2021 22:54*	WG1729646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	156		33.0	50.0	100	1	08/18/2021 23:55	WG1724076
C22-C32 Hydrocarbons	C22-C32	150		33.0	50.0	100	1	08/18/2021 23:55	WG1724076
C32-C40 Hydrocarbons	C32-C40	82.8	J	33.0	50.0	100	1	08/18/2021 23:55	WG1724076
(S) o-Terphenyl	*84-15-1*	*140*				*52.0-156*		*08/18/2021 23:55*	WG1724076

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.00	U	0.547	1.00	2.00	1	08/17/2021 00:50	WG1722886
Dalapon	75-99-0	1.00	U	0.344	1.00	2.00	1	08/17/2021 00:50	WG1722886
2,4-DB	94-82-6	1.00	U	0.302	1.00	2.00	1	08/17/2021 00:50	WG1722886
Dicamba	1918-00-9	1.00	U	0.245	1.00	2.00	1	08/17/2021 00:50	WG1722886
Dichloroprop	120-36-5	1.04	U	1.04	1.04	2.00	1	08/17/2021 00:50	WG1722886
Dinoseb	88-85-7	1.00	U	0.250	1.00	2.00	1	08/17/2021 00:50	WG1722886
MCPA	94-74-6	50.0	J4 U	13.1	50.0	100	1	08/17/2021 00:50	WG1722886
MCPP	93-65-2	66.0	U	66.0	66.0	100	1	08/17/2021 00:50	WG1722886
2,4,5-T	93-76-5	1.00	U	0.258	1.00	2.00	1	08/17/2021 00:50	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.00	U	0.335	1.00	2.00	1	08/17/2021 00:50	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*69.0*				*32.0-138*		*08/17/2021 00:50*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0250	U	0.0198	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Alpha BHC	319-84-6	0.0250	U	0.0172	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Beta BHC	319-85-7	0.0250	U	0.0208	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Delta BHC	319-86-8	0.0250	U	0.0150	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Gamma BHC	58-89-9	0.0250	U	0.0209	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Chlordane	57-74-9	0.250	U	0.0198	0.250	5.00	1	08/23/2021 04:14	WG1727077
4,4-DDD	72-54-8	0.0250	U	0.0177	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
4,4-DDE	72-55-9	0.0250	U	0.0154	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
4,4-DDT	50-29-3	0.0250	U	0.0198	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Dieldrin	60-57-1	0.0250	U	0.0162	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Endosulfan I	959-98-8	0.0250	U	0.0160	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Endosulfan II	33213-65-9	0.0250	U	0.0164	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Endosulfan sulfate	1031-07-8	0.0250	U	0.0217	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Endrin	72-20-8	0.0250	U	0.0161	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Endrin aldehyde	7421-93-4	0.0250	U	0.0237	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Endrin ketone	53494-70-5	0.0250	U	0.0219	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Heptachlor	76-44-8	0.0250	U	0.0148	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Heptachlor epoxide	1024-57-3	0.0250	U	0.0183	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Hexachlorobenzene	118-74-1	0.0250	U	0.0176	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Methoxychlor	72-43-5	0.0250	U	0.0193	0.0250	0.0500	1	08/23/2021 04:14	WG1727077
Toxaphene	8001-35-2	0.250	U	0.168	0.250	0.500	1	08/23/2021 04:14	WG1727077
(S) Decachlorobiphenyl	*2051-24-3*	*74.3*				*10.0-156*		*08/23/2021 04:14*	WG1727077
(S) Tetrachloro-m-xylene	*877-09-8*	*70.7*				*44.0-124*		*08/23/2021 04:14*	WG1727077

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.321	U	0.321	0.321	0.595	1.19	08/29/2021 19:59	WG1728813
PCB 1221	11104-28-2	0.321	U	0.321	0.321	0.595	1.19	08/29/2021 19:59	WG1728813
PCB 1232	11141-16-5	0.321	U	0.321	0.321	0.595	1.19	08/29/2021 19:59	WG1728813
PCB 1242	53469-21-9	0.325	J	0.321	0.321	0.595	1.19	08/29/2021 19:59	WG1728813
PCB 1248	12672-29-6	0.298	U	0.205	0.298	0.595	1.19	08/29/2021 19:59	WG1728813
PCB 1254	11097-69-1	0.298	U	0.205	0.298	0.595	1.19	08/29/2021 19:59	WG1728813
PCB 1260	11096-82-5	0.263	J	0.205	0.298	0.595	1.19	08/29/2021 19:59	WG1728813
PCB 1262	37324-23-5	0.298	U	0.205	0.298	0.595	1.19	08/29/2021 19:59	WG1728813
PCB 1268	11100-14-4	0.298	U	0.205	0.298	0.595	1.19	08/29/2021 19:59	WG1728813
(S) Decachlorobiphenyl	*2051-24-3*	*67.1*				*10.0-156*		*08/29/2021 19:59*	WG1728813
(S) Tetrachloro-m-xylene	*877-09-8*	*74.8*				*44.0-124*		*08/29/2021 19:59*	WG1728813

Sample Narrative:

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	

L1390235-04 WG1728813: Dilution due to sample volume.

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Benzo(a)anthracene	56-55-3	0.0232	B J	0.0200	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Benzo(a)pyrene	50-32-8	0.0199	B J	0.0180	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0256	B J	0.0170	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0352	B J	0.0180	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Benzo(k)fluoranthene	207-08-9	0.0270	B J	0.0200	0.125	0.250	1	08/18/2021 12:43	WG1723610
Chrysene	218-01-9	0.0270	B J	0.0180	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Dibenz(a,h)anthracene	53-70-3	0.0325	B J	0.0180	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Fluoranthene	206-44-0	0.0166	J	0.0110	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0276	B J	0.0180	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 12:43	WG1723610
Phenanthrene	85-01-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
Pyrene	129-00-0	0.0181	B J	0.0170	0.0250	0.0500	1	08/18/2021 12:43	WG1723610
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 12:43	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 12:43	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*86.5*				*55.0-111*		*08/18/2021 12:43*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*88.0*				*53.0-106*		*08/18/2021 12:43*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*101*				*58.0-132*		*08/18/2021 12:43*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*82.5*				*50.0-150*		*08/18/2021 12:43*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*88.5*				*50.0-150*		*08/18/2021 12:43*	WG1723610

Sample Narrative:

L1390235-04 WG1723610: Duplicate Analysis performed due to QC failure. Results confirm; reporting in hold data

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 15:21	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 15:21	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 15:21	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 15:21	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 15:21	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 15:21	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 15:21	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 15:21	WG1724081
Caprolactam	105-60-2	8.85	J	0.309	5.00	10.0	1	08/25/2021 03:30	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 15:21	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 15:21	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 15:21	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 15:21	WG1724081
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 15:21	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 15:21	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 15:21	WG1724081
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 15:21	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 15:21	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 15:21	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 15:21	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 15:21	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 15:21	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 15:21	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 15:21	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 15:21	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 15:21	WG1724081
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 15:21	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 15:21	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 15:21	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 15:21	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 15:21	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 15:21	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 15:21	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 15:21	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 15:21	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 15:21	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 15:21	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 15:21	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 15:21	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 15:21	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 15:21	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 15:21	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 15:21	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 15:21	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 15:21	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 15:21	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 15:21	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*32.0*				*19.0-119*		*08/25/2021 03:30*	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*39.8*				*19.0-119*		*08/18/2021 15:21*	WG1724081
(S) Phenol-d5	*4165-62-2*	*21.8*				*10.0-67.0*		*08/25/2021 03:30*	WG1724081
(S) Phenol-d5	*4165-62-2*	*26.1*				*10.0-67.0*		*08/18/2021 15:21*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*56.9*				*44.0-120*		*08/18/2021 15:21*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*55.3*				*44.0-120*		*08/25/2021 03:30*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*59.9*				*44.0-119*		*08/18/2021 15:21*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*59.4*				*44.0-119*		*08/25/2021 03:30*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*37.5*	J2			*43.0-140*		*08/25/2021 03:30*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*60.0*				*43.0-140*		*08/18/2021 15:21*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*55.2*				*50.0-134*		*08/18/2021 15:21*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*56.2*				*50.0-134*		*08/25/2021 03:30*	WG1724081

Sample Narrative:

L1390235-04 WG1724081: Surrogate recovery within historical limits.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Wet Chemistry by Method 7196A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:54	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 09:58	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:39	WG1724277
Arsenic	7440-38-2	5.00	U	4.40	5.00	10.0	1	08/20/2021 09:39	WG1724277
Barium	7440-39-3	8.31		0.736	2.50	5.00	1	08/20/2021 09:39	WG1724277
Beryllium	7440-41-7	1.00	U	0.330	1.00	2.00	1	08/20/2021 09:39	WG1724277
Cadmium	7440-43-9	1.10	J	0.479	1.00	2.00	1	08/20/2021 09:39	WG1724277
Calcium	7440-70-2	13700		79.3	500	1000	1	08/20/2021 09:39	WG1724277
Chromium	7440-47-3	17.0		1.40	5.00	10.0	1	08/20/2021 09:39	WG1724277
Cobalt	7440-48-4	1.52	J	0.840	5.00	10.0	1	08/20/2021 09:39	WG1724277
Copper	7440-50-8	7.80	J	3.68	5.00	10.0	1	08/20/2021 09:39	WG1724277
Lead	7439-92-1	3.37	J	2.99	2.50	6.00	1	08/20/2021 09:39	WG1724277
Molybdenum	7439-98-7	2.50	U	1.16	2.50	5.00	1	08/20/2021 09:39	WG1724277
Nickel	7440-02-0	12.4		1.61	5.00	10.0	1	08/20/2021 09:39	WG1724277
Selenium	7782-49-2	8.00	U	7.35	8.00	10.0	1	08/20/2021 09:39	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:39	WG1724277
Thallium	7440-28-0	5.00	U	4.31	5.00	10.0	1	08/20/2021 09:39	WG1724277
Vanadium	7440-62-2	10.0	U	4.99	10.0	20.0	1	08/20/2021 09:39	WG1724277
Zinc	7440-66-6	31.2	J	6.52	25.0	50.0	1	08/20/2021 09:39	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
TPHG C5 - C12	TPHG C5 - C12	42.6	B J	30.4	50.0	100	1	08/14/2021 20:16	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*106*				*62.0-128*		*08/14/2021 20:16*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	08/25/2021 23:15	WG1729646
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 05:41	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 05:41	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 05:41	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 05:41	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 05:41	WG1725112
Carbon disulfide	75-15-0	0.500	U	0.0962	0.500	1.00	1	08/20/2021 05:41	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 18:13	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 05:41	WG1725112
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	08/20/2021 05:41	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 05:41	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 05:41	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 05:41	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 05:41	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 05:41	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 05:41	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 05:41	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 05:41	WG1725112
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	08/20/2021 05:41	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 05:41	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 05:41	WG1725112
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	08/20/2021 05:41	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 05:41	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 05:41	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 05:41	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 05:41	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 05:41	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 18:13	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 05:41	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 05:41	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 18:13	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 05:41	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 05:41	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 05:41	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 05:41	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 05:41	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 05:41	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 05:41	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 05:41	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 05:41	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 05:41	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 05:41	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 05:41	WG1725112
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	08/20/2021 05:41	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 05:41	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 18:13	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 05:41	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 05:41	WG1725112
(S) Toluene-d8	*2037-26-5*	*107*				*89.0-112*		*08/20/2021 05:41*	WG1725112
(S) Toluene-d8	*2037-26-5*	*104*				*89.0-112*		*08/24/2021 18:13*	WG1728438
(S) Toluene-d8	*2037-26-5*	*91.5*				*89.0-112*		*08/25/2021 23:15*	WG1729646
(S) 4-Bromofluorobenzene	*460-00-4*	*101*				*85.0-114*		*08/20/2021 05:41*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*101*				*85.0-114*		*08/24/2021 18:13*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*98.9*				*85.0-114*		*08/25/2021 23:15*	WG1729646
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*101*				*81.0-118*		*08/20/2021 05:41*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*100*				*81.0-118*		*08/24/2021 18:13*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*109*				*81.0-118*		*08/25/2021 23:15*	WG1729646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	50.0	U	33.0	50.0	100	1	08/19/2021 00:21	WG1724076
C22-C32 Hydrocarbons	C22-C32	50.0	U	33.0	50.0	100	1	08/19/2021 00:21	WG1724076
C32-C40 Hydrocarbons	C32-C40	50.0	U	33.0	50.0	100	1	08/19/2021 00:21	WG1724076
(S) o-Terphenyl	*84-15-1*	*63.2*				*52.0-156*		*08/19/2021 00:21*	WG1724076

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.05	U	0.574	1.05	2.10	1.05	08/17/2021 01:05	WG1722886
Dalapon	75-99-0	1.05	U	0.361	1.05	2.10	1.05	08/17/2021 01:05	WG1722886
2,4-DB	94-82-6	1.05	U	0.317	1.05	2.10	1.05	08/17/2021 01:05	WG1722886
Dicamba	1918-00-9	1.05	U	0.257	1.05	2.10	1.05	08/17/2021 01:05	WG1722886
Dichloroprop	120-36-5	1.09	U	1.09	1.09	2.10	1.05	08/17/2021 01:05	WG1722886
Dinoseb	88-85-7	1.05	U	0.263	1.05	2.10	1.05	08/17/2021 01:05	WG1722886
MCPA	94-74-6	52.5	J4 U	13.8	52.5	105	1.05	08/17/2021 01:05	WG1722886
MCPP	93-65-2	69.3	U	69.3	69.3	105	1.05	08/17/2021 01:05	WG1722886
2,4,5-T	93-76-5	1.05	U	0.271	1.05	2.10	1.05	08/17/2021 01:05	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.05	U	0.352	1.05	2.10	1.05	08/17/2021 01:05	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*73.0*				*32.0-138*		*08/17/2021 01:05*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0260	U	0.0206	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Alpha BHC	319-84-6	0.0260	U	0.0179	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Beta BHC	319-85-7	0.0260	U	0.0216	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Delta BHC	319-86-8	0.0260	U	0.0156	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Gamma BHC	58-89-9	0.0260	U	0.0217	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Chlordane	57-74-9	0.260	U	0.0206	0.260	5.20	1.04	08/23/2021 04:22	WG1727077
4,4-DDD	72-54-8	0.0260	U	0.0184	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
4,4-DDE	72-55-9	0.0260	U	0.0160	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
4,4-DDT	50-29-3	0.0260	U	0.0206	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Dieldrin	60-57-1	0.0260	U	0.0168	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Endosulfan I	959-98-8	0.0260	U	0.0166	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Endosulfan II	33213-65-9	0.0260	U	0.0171	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Endosulfan sulfate	1031-07-8	0.0260	U	0.0226	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Endrin	72-20-8	0.0260	U	0.0167	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Endrin aldehyde	7421-93-4	0.0260	U	0.0246	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Endrin ketone	53494-70-5	0.0260	U	0.0228	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Heptachlor	76-44-8	0.0260	U	0.0154	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Heptachlor epoxide	1024-57-3	0.0260	U	0.0190	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Hexachlorobenzene	118-74-1	0.0260	U	0.0183	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Methoxychlor	72-43-5	0.0260	U	0.0201	0.0260	0.0520	1.04	08/23/2021 04:22	WG1727077
Toxaphene	8001-35-2	0.260	U	0.175	0.260	0.520	1.04	08/23/2021 04:22	WG1727077
(S) Decachlorobiphenyl	*2051-24-3*	*69.9*				*10.0-156*		*08/23/2021 04:22*	WG1727077
(S) Tetrachloro-m-xylene	*877-09-8*	*71.3*				*44.0-124*		*08/23/2021 04:22*	WG1727077

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:24	WG1728813
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:24	WG1728813
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:24	WG1728813
PCB 1242	53469-21-9	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:24	WG1728813
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:24	WG1728813
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:24	WG1728813
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:24	WG1728813
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:24	WG1728813
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:24	WG1728813
(S) Decachlorobiphenyl	*2051-24-3*	*46.3*				*10.0-156*		*08/29/2021 20:24*	WG1728813
(S) Tetrachloro-m-xylene	*877-09-8*	*76.8*				*44.0-124*		*08/29/2021 20:24*	WG1728813

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Benzo(a)anthracene	56-55-3	0.0259	B J	0.0200	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Benzo(a)anthracene	56-55-3	0.0250	Q U	0.0200	0.0250	0.0500	1	08/22/2021 13:59	WG1726247
Benzo(a)pyrene	50-32-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0200	B J	0.0170	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0250	Q U	0.0170	0.0250	0.0500	1	08/22/2021 13:59	WG1726247
Benzo(g,h,i)perylene	191-24-2	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Benzo(k)fluoranthene	207-08-9	0.125	U	0.0200	0.125	0.250	1	08/18/2021 13:01	WG1723610
Chrysene	218-01-9	0.0208	B J	0.0180	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Chrysene	218-01-9	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 13:59	WG1726247
Dibenz(a,h)anthracene	53-70-3	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Fluoranthene	206-44-0	0.0196	J	0.0110	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Fluoranthene	206-44-0	0.0250	Q U	0.0110	0.0250	0.0500	1	08/22/2021 13:59	WG1726247
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 13:01	WG1723610
Phenanthrene	85-01-8	0.0205	B J	0.0180	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Phenanthrene	85-01-8	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 13:59	WG1726247
Pyrene	129-00-0	0.0241	B J	0.0170	0.0250	0.0500	1	08/18/2021 13:01	WG1723610
Pyrene	129-00-0	0.0250	Q U	0.0170	0.0250	0.0500	1	08/22/2021 13:59	WG1726247
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 13:01	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 13:01	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*67.0*				*55.0-111*		*08/18/2021 13:01*	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*74.5*				*55.0-111*		*08/22/2021 13:59*	WG1726247
(S) 2-Fluorobiphenyl	*321-60-8*	*55.5*				*53.0-106*		*08/18/2021 13:01*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*68.0*				*53.0-106*		*08/22/2021 13:59*	WG1726247
(S) p-Terphenyl-d14	*1718-51-0*	*57.0*	J2			*58.0-132*		*08/18/2021 13:01*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*78.0*				*58.0-132*		*08/22/2021 13:59*	WG1726247
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*55.0*				*50.0-150*		*08/18/2021 13:01*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*68.5*				*50.0-150*		*08/22/2021 13:59*	WG1726247
(S) Fluoranthene-D10	*93951-69-0*	*42.2*	J2			*50.0-150*		*08/18/2021 13:01*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*70.0*				*50.0-150*		*08/22/2021 13:59*	WG1726247

Sample Narrative:

L1390235-05 WG1723610, WG1726247: Duplicate Analysis performed due to QC failure. Results don't confirm; both analyses reported

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 15:42	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 15:42	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 15:42	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 15:42	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 15:42	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 15:42	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 15:42	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 15:42	WG1724081
Caprolactam	105-60-2	0.788	J	0.309	5.00	10.0	1	08/18/2021 15:42	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 15:42	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 15:42	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 15:42	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 15:42	WG1724081
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 15:42	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 15:42	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 15:42	WG1724081
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 15:42	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 15:42	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 15:42	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 15:42	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 15:42	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 15:42	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 15:42	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 15:42	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 15:42	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 15:42	WG1724081
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 15:42	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 15:42	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 15:42	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 15:42	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 15:42	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 15:42	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 15:42	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 15:42	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 15:42	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 15:42	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 15:42	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 15:42	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 15:42	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 15:42	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 15:42	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 15:42	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 15:42	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 15:42	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 15:42	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 15:42	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 15:42	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*31.6*				*19.0-119*		*08/18/2021 15:42*	WG1724081
(S) Phenol-d5	*4165-62-2*	*21.9*				*10.0-67.0*		*08/18/2021 15:42*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*43.9*	J2			*44.0-120*		*08/18/2021 15:42*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*48.1*				*44.0-119*		*08/18/2021 15:42*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*47.9*				*43.0-140*		*08/18/2021 15:42*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*45.8*	J2			*50.0-134*		*08/18/2021 15:42*	WG1724081

Sample Narrative:

L1390235-05 WG1724081: Surrogate recovery within historical limits.

Wet Chemistry by Method 7196A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chromium,Hexavalent	18540-29-9	3.00	J T8	3.00	5.00	10.0	1	08/14/2021 00:54	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 10:00	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:42	WG1724277
Arsenic	7440-38-2	5.00	U	4.40	5.00	10.0	1	08/20/2021 09:42	WG1724277
Barium	7440-39-3	14.0		0.736	2.50	5.00	1	08/20/2021 09:42	WG1724277
Beryllium	7440-41-7	1.00	U	0.330	1.00	2.00	1	08/20/2021 09:42	WG1724277
Cadmium	7440-43-9	0.599	J	0.479	1.00	2.00	1	08/20/2021 09:42	WG1724277
Calcium	7440-70-2	123000		79.3	500	1000	1	08/20/2021 09:42	WG1724277
Chromium	7440-47-3	1.84	J	1.40	5.00	10.0	1	08/20/2021 09:42	WG1724277
Cobalt	7440-48-4	5.00	U	0.840	5.00	10.0	1	08/20/2021 09:42	WG1724277
Copper	7440-50-8	5.00	U	3.68	5.00	10.0	1	08/20/2021 09:42	WG1724277
Lead	7439-92-1	2.50	U	2.99	2.50	6.00	1	08/20/2021 09:42	WG1724277
Molybdenum	7439-98-7	1.38	J	1.16	2.50	5.00	1	08/20/2021 09:42	WG1724277
Nickel	7440-02-0	5.00	U	1.61	5.00	10.0	1	08/20/2021 09:42	WG1724277
Selenium	7782-49-2	7.76	J	7.35	8.00	10.0	1	08/20/2021 09:42	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:42	WG1724277
Thallium	7440-28-0	5.00	U	4.31	5.00	10.0	1	08/20/2021 09:42	WG1724277
Vanadium	7440-62-2	10.0	U	4.99	10.0	20.0	1	08/20/2021 09:42	WG1724277
Zinc	7440-66-6	25.0	U	6.52	25.0	50.0	1	08/20/2021 09:42	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
TPHG C5 - C12	TPHG C5 - C12	38.5	B J	30.4	50.0	100	1	08/14/2021 20:39	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*105*				*62.0-128*		*08/14/2021 20:39*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	28.6	J	11.3	25.0	50.0	1	08/25/2021 23:35	WG1729646
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 06:00	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 06:00	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 06:00	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 06:00	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 06:00	WG1725112
Carbon disulfide	75-15-0	0.500	U	0.0962	0.500	1.00	1	08/20/2021 06:00	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 18:33	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 06:00	WG1725112
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	08/20/2021 06:00	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 06:00	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 06:00	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 06:00	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 06:00	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 06:00	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 06:00	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 06:00	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 06:00	WG1725112
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	08/20/2021 06:00	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 06:00	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 06:00	WG1725112
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	08/20/2021 06:00	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:00	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:00	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 06:00	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 06:00	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 06:00	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 18:33	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 06:00	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 06:00	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 18:33	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 06:00	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 06:00	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 06:00	WG1725112
Methyl tert-butyl ether	1634-04-4	0.176	J	0.101	0.500	1.00	1	08/20/2021 06:00	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 06:00	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 06:00	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 06:00	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 06:00	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 06:00	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 06:00	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:00	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 06:00	WG1725112
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	08/20/2021 06:00	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 06:00	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 18:33	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 06:00	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 06:00	WG1725112
(S) Toluene-d8	*2037-26-5*	*106*				*89.0-112*		*08/20/2021 06:00*	WG1725112
(S) Toluene-d8	*2037-26-5*	*104*				*89.0-112*		*08/24/2021 18:33*	WG1728438
(S) Toluene-d8	*2037-26-5*	*89.9*				*89.0-112*		*08/25/2021 23:35*	WG1729646
(S) 4-Bromofluorobenzene	*460-00-4*	*102*				*85.0-114*		*08/20/2021 06:00*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*100*				*85.0-114*		*08/24/2021 18:33*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*97.3*				*85.0-114*		*08/25/2021 23:35*	WG1729646
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*104*				*81.0-118*		*08/20/2021 06:00*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*105*				*81.0-118*		*08/24/2021 18:33*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*107*				*81.0-118*		*08/25/2021 23:35*	WG1729646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	50.0	U	33.0	50.0	100	1	08/19/2021 00:47	WG1724076
C22-C32 Hydrocarbons	C22-C32	50.0	U	33.0	50.0	100	1	08/19/2021 00:47	WG1724076
C32-C40 Hydrocarbons	C32-C40	50.0	U	33.0	50.0	100	1	08/19/2021 00:47	WG1724076
(S) o-Terphenyl	*84-15-1*	*65.3*				*52.0-156*		*08/19/2021 00:47*	WG1724076

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.00	U	0.547	1.00	2.00	1	08/17/2021 01:19	WG1722886
Dalapon	75-99-0	1.00	U	0.344	1.00	2.00	1	08/17/2021 01:19	WG1722886
2,4-DB	94-82-6	1.00	U	0.302	1.00	2.00	1	08/17/2021 01:19	WG1722886
Dicamba	1918-00-9	1.00	U	0.245	1.00	2.00	1	08/17/2021 01:19	WG1722886
Dichloroprop	120-36-5	1.04	U	1.04	1.04	2.00	1	08/17/2021 01:19	WG1722886
Dinoseb	88-85-7	1.00	U	0.250	1.00	2.00	1	08/17/2021 01:19	WG1722886
MCPA	94-74-6	50.0	J4 U	13.1	50.0	100	1	08/17/2021 01:19	WG1722886
MCPP	93-65-2	66.0	U	66.0	66.0	100	1	08/17/2021 01:19	WG1722886
2,4,5-T	93-76-5	1.00	U	0.258	1.00	2.00	1	08/17/2021 01:19	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.00	U	0.335	1.00	2.00	1	08/17/2021 01:19	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*77.6*				*32.0-138*		*08/17/2021 01:19*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0250	U	0.0198	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Alpha BHC	319-84-6	0.0250	U	0.0172	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Beta BHC	319-85-7	0.0250	U	0.0208	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Delta BHC	319-86-8	0.0250	U	0.0150	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Gamma BHC	58-89-9	0.0250	U	0.0209	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Chlordane	57-74-9	0.250	U	0.0198	0.250	5.00	1	08/23/2021 04:31	WG1727077
4,4-DDD	72-54-8	0.0250	U	0.0177	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
4,4-DDE	72-55-9	0.0250	U	0.0154	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
4,4-DDT	50-29-3	0.0250	U	0.0198	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Dieldrin	60-57-1	0.0250	U	0.0162	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Endosulfan I	959-98-8	0.0250	U	0.0160	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Endosulfan II	33213-65-9	0.0250	U	0.0164	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Endosulfan sulfate	1031-07-8	0.0250	U	0.0217	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Endrin	72-20-8	0.0250	U	0.0161	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Endrin aldehyde	7421-93-4	0.0250	U	0.0237	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Endrin ketone	53494-70-5	0.0250	U	0.0219	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Heptachlor	76-44-8	0.0250	U	0.0148	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Heptachlor epoxide	1024-57-3	0.0250	U	0.0183	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Hexachlorobenzene	118-74-1	0.0250	U	0.0176	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Methoxychlor	72-43-5	0.0250	U	0.0193	0.0250	0.0500	1	08/23/2021 04:31	WG1727077
Toxaphene	8001-35-2	0.250	U	0.168	0.250	0.500	1	08/23/2021 04:31	WG1727077
(S) Decachlorobiphenyl	*2051-24-3*	*66.0*				*10.0-156*		*08/23/2021 04:31*	WG1727077
(S) Tetrachloro-m-xylene	*877-09-8*	*65.5*				*44.0-124*		*08/23/2021 04:31*	WG1727077

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:36	WG1728813
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:36	WG1728813
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:36	WG1728813
PCB 1242	53469-21-9	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:36	WG1728813
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:36	WG1728813
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:36	WG1728813
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:36	WG1728813
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:36	WG1728813
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:36	WG1728813
(S) Decachlorobiphenyl	*2051-24-3*	*63.5*				*10.0-156*		*08/29/2021 20:36*	WG1728813
(S) Tetrachloro-m-xylene	*877-09-8*	*86.0*				*44.0-124*		*08/29/2021 20:36*	WG1728813

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Benzo(a)anthracene	56-55-3	0.0224	B J	0.0200	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Benzo(a)pyrene	50-32-8	0.0222	B J	0.0180	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0253	B J	0.0170	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0279	B J	0.0180	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 14:19	WG1726247
Benzo(k)fluoranthene	207-08-9	0.0237	B J	0.0200	0.125	0.250	1	08/18/2021 16:29	WG1723610
Benzo(k)fluoranthene	207-08-9	0.125	Q U	0.0200	0.125	0.250	1	08/22/2021 14:19	WG1726247
Chrysene	218-01-9	0.0188	B J	0.0180	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Dibenz(a,h)anthracene	53-70-3	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Fluoranthene	206-44-0	0.0227	J	0.0110	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0313	B J	0.0180	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 14:19	WG1726247
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 16:29	WG1723610
Phenanthrene	85-01-8	0.0210	B J	0.0180	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Phenanthrene	85-01-8	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 14:19	WG1726247
Pyrene	129-00-0	0.0241	B J	0.0170	0.0250	0.0500	1	08/18/2021 16:29	WG1723610
Pyrene	129-00-0	0.0250	Q U	0.0170	0.0250	0.0500	1	08/22/2021 14:19	WG1726247
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 16:29	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 16:29	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*79.0*				*55.0-111*		*08/18/2021 16:29*	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*85.0*				*55.0-111*		*08/22/2021 14:19*	WG1726247
(S) 2-Fluorobiphenyl	*321-60-8*	*83.0*				*53.0-106*		*08/18/2021 16:29*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*81.0*				*53.0-106*		*08/22/2021 14:19*	WG1726247
(S) p-Terphenyl-d14	*1718-51-0*	*85.5*				*58.0-132*		*08/18/2021 16:29*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*90.0*				*58.0-132*		*08/22/2021 14:19*	WG1726247
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*78.0*				*50.0-150*		*08/18/2021 16:29*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*81.5*				*50.0-150*		*08/22/2021 14:19*	WG1726247
(S) Fluoranthene-D10	*93951-69-0*	*80.0*				*50.0-150*		*08/18/2021 16:29*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*81.5*				*50.0-150*		*08/22/2021 14:19*	WG1726247

Sample Narrative:

L1390235-06 WG1723610, WG1726247: Duplicate Analysis performed due to QC failure. Results don't confirm; both analyses reported

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 16:03	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 16:03	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 16:03	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 16:03	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 16:03	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 16:03	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 16:03	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 16:03	WG1724081
Caprolactam	105-60-2	2.50	J	0.309	5.00	10.0	1	08/18/2021 16:03	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 16:03	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 16:03	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 16:03	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 16:03	WG1724081
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 16:03	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 16:03	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 16:03	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 16:03	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 16:03	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 16:03	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 16:03	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 16:03	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 16:03	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 16:03	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 16:03	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 16:03	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 16:03	WG1724081
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 16:03	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 16:03	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 16:03	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 16:03	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 16:03	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 16:03	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 16:03	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 16:03	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 16:03	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 16:03	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 16:03	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 16:03	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 16:03	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 16:03	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 16:03	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 16:03	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 16:03	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 16:03	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 16:03	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 16:03	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 16:03	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*38.2*				*19.0-119*		*08/18/2021 16:03*	WG1724081
(S) Phenol-d5	*4165-62-2*	*26.8*				*10.0-67.0*		*08/18/2021 16:03*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*57.5*				*44.0-120*		*08/18/2021 16:03*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*62.3*				*44.0-119*		*08/18/2021 16:03*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*63.5*				*43.0-140*		*08/18/2021 16:03*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*60.6*				*50.0-134*		*08/18/2021 16:03*	WG1724081

Wet Chemistry by Method 7196A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:55	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 10:03	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:45	WG1724277
Arsenic	7440-38-2	4.76	J	4.40	5.00	10.0	1	08/20/2021 09:45	WG1724277
Barium	7440-39-3	28.0		0.736	2.50	5.00	1	08/20/2021 09:45	WG1724277
Beryllium	7440-41-7	1.00	U	0.330	1.00	2.00	1	08/20/2021 09:45	WG1724277
Cadmium	7440-43-9	1.00	U	0.479	1.00	2.00	1	08/20/2021 09:45	WG1724277
Calcium	7440-70-2	39000		79.3	500	1000	1	08/20/2021 09:45	WG1724277
Chromium	7440-47-3	4.89	J	1.40	5.00	10.0	1	08/20/2021 09:45	WG1724277
Cobalt	7440-48-4	5.00	U	0.840	5.00	10.0	1	08/20/2021 09:45	WG1724277
Copper	7440-50-8	6.78	J	3.68	5.00	10.0	1	08/20/2021 09:45	WG1724277
Lead	7439-92-1	2.50	U	2.99	2.50	6.00	1	08/20/2021 09:45	WG1724277
Molybdenum	7439-98-7	38.1		1.16	2.50	5.00	1	08/20/2021 09:45	WG1724277
Nickel	7440-02-0	5.00	U	1.61	5.00	10.0	1	08/20/2021 09:45	WG1724277
Selenium	7782-49-2	15.0		7.35	8.00	10.0	1	08/20/2021 09:45	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:45	WG1724277
Thallium	7440-28-0	5.00	U	4.31	5.00	10.0	1	08/20/2021 09:45	WG1724277
Vanadium	7440-62-2	33.2		4.99	10.0	20.0	1	08/20/2021 09:45	WG1724277
Zinc	7440-66-6	25.0	U	6.52	25.0	50.0	1	08/20/2021 09:45	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
TPHG C5 - C12	TPHG C5 - C12	34.8	B J	30.4	50.0	100	1	08/14/2021 21:03	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*107*				*62.0-128*		*08/14/2021 21:03*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	08/25/2021 21:44	WG1729598
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 06:19	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 06:19	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 06:19	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 06:19	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 06:19	WG1725112
Carbon disulfide	75-15-0	0.357	J	0.0962	0.500	1.00	1	08/20/2021 06:19	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 18:54	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 06:19	WG1725112
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	08/20/2021 06:19	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 06:19	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 06:19	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 06:19	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 06:19	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 06:19	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 06:19	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 06:19	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 06:19	WG1725112
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	08/20/2021 06:19	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 06:19	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 06:19	WG1725112
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	08/20/2021 06:19	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:19	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:19	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 06:19	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 06:19	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 06:19	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 18:54	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 06:19	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 06:19	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 18:54	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 06:19	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 06:19	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 06:19	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 06:19	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 06:19	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 06:19	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 06:19	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 06:19	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 06:19	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 06:19	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:19	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 06:19	WG1725112
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	08/20/2021 06:19	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 06:19	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 18:54	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 06:19	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 06:19	WG1725112
(S) Toluene-d8	*2037-26-5*	*108*				*89.0-112*		*08/20/2021 06:19*	WG1725112
(S) Toluene-d8	*2037-26-5*	*104*				*89.0-112*		*08/24/2021 18:54*	WG1728438
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*08/25/2021 21:44*	WG1729598
(S) 4-Bromofluorobenzene	*460-00-4*	*100*				*85.0-114*		*08/20/2021 06:19*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*97.2*				*85.0-114*		*08/24/2021 18:54*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*92.4*				*85.0-114*		*08/25/2021 21:44*	WG1729598
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*103*				*81.0-118*		*08/20/2021 06:19*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*105*				*81.0-118*		*08/24/2021 18:54*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*94.9*				*81.0-118*		*08/25/2021 21:44*	WG1729598

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	121		33.0	50.0	100	1	08/19/2021 01:13	WG1724076
C22-C32 Hydrocarbons	C22-C32	50.0	U	33.0	50.0	100	1	08/19/2021 01:13	WG1724076
C32-C40 Hydrocarbons	C32-C40	50.0	U	33.0	50.0	100	1	08/19/2021 01:13	WG1724076
(S) o-Terphenyl	*84-15-1*	*61.6*				*52.0-156*		*08/19/2021 01:13*	WG1724076

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.00	U	0.547	1.00	2.00	1	08/17/2021 01:34	WG1722886
Dalapon	75-99-0	1.00	U	0.344	1.00	2.00	1	08/17/2021 01:34	WG1722886
2,4-DB	94-82-6	1.00	U	0.302	1.00	2.00	1	08/17/2021 01:34	WG1722886
Dicamba	1918-00-9	1.00	U	0.245	1.00	2.00	1	08/17/2021 01:34	WG1722886
Dichloroprop	120-36-5	1.04	U	1.04	1.04	2.00	1	08/17/2021 01:34	WG1722886
Dinoseb	88-85-7	1.00	U	0.250	1.00	2.00	1	08/17/2021 01:34	WG1722886
MCPA	94-74-6	50.0	J4 U	13.1	50.0	100	1	08/17/2021 01:34	WG1722886
MCPP	93-65-2	66.0	U	66.0	66.0	100	1	08/17/2021 01:34	WG1722886
2,4,5-T	93-76-5	1.00	U	0.258	1.00	2.00	1	08/17/2021 01:34	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.00	U	0.335	1.00	2.00	1	08/17/2021 01:34	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*76.4*				*32.0-138*		*08/17/2021 01:34*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0250	U	0.0198	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Alpha BHC	319-84-6	0.0250	U	0.0172	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Beta BHC	319-85-7	0.0250	U	0.0208	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Delta BHC	319-86-8	0.0250	U	0.0150	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Gamma BHC	58-89-9	0.0250	U	0.0209	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Chlordane	57-74-9	0.250	U	0.0198	0.250	5.00	1	08/23/2021 04:40	WG1727077
4,4-DDD	72-54-8	0.0250	U	0.0177	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
4,4-DDE	72-55-9	0.0250	U	0.0154	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
4,4-DDT	50-29-3	0.0250	U	0.0198	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Dieldrin	60-57-1	0.0250	U	0.0162	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Endosulfan I	959-98-8	0.0250	U	0.0160	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Endosulfan II	33213-65-9	0.0250	U	0.0164	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Endosulfan sulfate	1031-07-8	0.0250	U	0.0217	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Endrin	72-20-8	0.0250	U	0.0161	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Endrin aldehyde	7421-93-4	0.0250	U	0.0237	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Endrin ketone	53494-70-5	0.0250	U	0.0219	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Heptachlor	76-44-8	0.0250	U	0.0148	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Heptachlor epoxide	1024-57-3	0.0250	U	0.0183	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Hexachlorobenzene	118-74-1	0.0250	U	0.0176	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Methoxychlor	72-43-5	0.0250	U	0.0193	0.0250	0.0500	1	08/23/2021 04:40	WG1727077
Toxaphene	8001-35-2	0.250	U	0.168	0.250	0.500	1	08/23/2021 04:40	WG1727077
(S) Decachlorobiphenyl	*2051-24-3*	*65.6*				*10.0-156*		*08/23/2021 04:40*	WG1727077
(S) Tetrachloro-m-xylene	*877-09-8*	*66.6*				*44.0-124*		*08/23/2021 04:40*	WG1727077

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:48	WG1728813
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:48	WG1728813
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:48	WG1728813
PCB 1242	53469-21-9	0.270	U	0.270	0.270	0.500	1	08/29/2021 20:48	WG1728813
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:48	WG1728813
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:48	WG1728813
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:48	WG1728813
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:48	WG1728813
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/29/2021 20:48	WG1728813
(S) Decachlorobiphenyl	*2051-24-3*	*49.6*				*10.0-156*		*08/29/2021 20:48*	WG1728813
(S) Tetrachloro-m-xylene	*877-09-8*	*62.9*				*44.0-124*		*08/29/2021 20:48*	WG1728813

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Benzo(a)anthracene	56-55-3	0.0234	B J	0.0200	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Benzo(a)anthracene	56-55-3	0.0250	Q U	0.0200	0.0250	0.0500	1	08/22/2021 14:39	WG1726247
Benzo(a)pyrene	50-32-8	0.0253	B J	0.0180	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Benzo(a)pyrene	50-32-8	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 14:39	WG1726247
Benzo(b)fluoranthene	205-99-2	0.0310	B J	0.0170	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0250	Q U	0.0170	0.0250	0.0500	1	08/22/2021 14:39	WG1726247
Benzo(g,h,i)perylene	191-24-2	0.0215	B J	0.0180	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 14:39	WG1726247
Benzo(k)fluoranthene	207-08-9	0.0271	B J	0.0200	0.125	0.250	1	08/18/2021 13:18	WG1723610
Benzo(k)fluoranthene	207-08-9	0.125	Q U	0.0200	0.125	0.250	1	08/22/2021 14:39	WG1726247
Chrysene	218-01-9	0.0214	B J	0.0180	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Chrysene	218-01-9	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 14:39	WG1726247
Dibenz(a,h)anthracene	53-70-3	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Fluoranthene	206-44-0	0.0220	J	0.0110	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0256	B J	0.0180	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 14:39	WG1726247
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 13:18	WG1723610
Phenanthrene	85-01-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Pyrene	129-00-0	0.0278	B J	0.0170	0.0250	0.0500	1	08/18/2021 13:18	WG1723610
Pyrene	129-00-0	0.0250	Q U	0.0170	0.0250	0.0500	1	08/22/2021 14:39	WG1726247
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 13:18	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 13:18	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*83.5*				*55.0-111*		*08/18/2021 13:18*	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*72.5*				*55.0-111*		*08/22/2021 14:39*	WG1726247
(S) 2-Fluorobiphenyl	*321-60-8*	*86.5*				*53.0-106*		*08/18/2021 13:18*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*67.0*				*53.0-106*		*08/22/2021 14:39*	WG1726247
(S) p-Terphenyl-d14	*1718-51-0*	*99.0*				*58.0-132*		*08/18/2021 13:18*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*73.0*				*58.0-132*		*08/22/2021 14:39*	WG1726247
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*80.0*				*50.0-150*		*08/18/2021 13:18*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*67.5*				*50.0-150*		*08/22/2021 14:39*	WG1726247
(S) Fluoranthene-D10	*93951-69-0*	*86.5*				*50.0-150*		*08/18/2021 13:18*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*71.0*				*50.0-150*		*08/22/2021 14:39*	WG1726247

Sample Narrative:

L1390235-07 WG1723610, WG1726247: Duplicate Analysis performed due to QC failure. Results don't confirm; both analyses reported

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 16:25	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 16:25	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 16:25	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 16:25	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 16:25	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 16:25	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 16:25	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 16:25	WG1724081
Caprolactam	105-60-2	1.28	J	0.309	5.00	10.0	1	08/18/2021 16:25	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 16:25	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 16:25	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 16:25	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 16:25	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 16:25	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 16:25	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 16:25	WG1724081
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 16:25	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 16:25	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 16:25	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 16:25	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 16:25	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 16:25	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 16:25	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 16:25	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 16:25	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 16:25	WG1724081
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 16:25	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 16:25	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 16:25	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 16:25	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 16:25	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 16:25	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 16:25	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 16:25	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 16:25	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 16:25	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 16:25	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 16:25	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 16:25	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 16:25	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 16:25	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 16:25	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 16:25	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 16:25	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 16:25	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 16:25	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 16:25	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*45.8*				*19.0-119*		*08/18/2021 16:25*	WG1724081
(S) Phenol-d5	*4165-62-2*	*29.2*				*10.0-67.0*		*08/18/2021 16:25*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*64.5*				*44.0-120*		*08/18/2021 16:25*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*72.0*				*44.0-119*		*08/18/2021 16:25*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*77.5*				*43.0-140*		*08/18/2021 16:25*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*66.5*				*50.0-134*		*08/18/2021 16:25*	WG1724081

Wet Chemistry by Method 7196A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:55	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 10:10	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:48	WG1724277
Arsenic	7440-38-2	5.00	U	4.40	5.00	10.0	1	08/20/2021 09:48	WG1724277
Barium	7440-39-3	192		0.736	2.50	5.00	1	08/20/2021 09:48	WG1724277
Beryllium	7440-41-7	0.597	J	0.330	1.00	2.00	1	08/20/2021 09:48	WG1724277
Cadmium	7440-43-9	1.21	J	0.479	1.00	2.00	1	08/20/2021 09:48	WG1724277
Calcium	7440-70-2	81300		79.3	500	1000	1	08/20/2021 09:48	WG1724277
Chromium	7440-47-3	51.6		1.40	5.00	10.0	1	08/20/2021 09:48	WG1724277
Cobalt	7440-48-4	15.1		0.840	5.00	10.0	1	08/20/2021 09:48	WG1724277
Copper	7440-50-8	45.2		3.68	5.00	10.0	1	08/20/2021 09:48	WG1724277
Lead	7439-92-1	5.68	J	2.99	2.50	6.00	1	08/20/2021 09:48	WG1724277
Molybdenum	7439-98-7	2.50	U	1.16	2.50	5.00	1	08/20/2021 09:48	WG1724277
Nickel	7440-02-0	74.4		1.61	5.00	10.0	1	08/20/2021 09:48	WG1724277
Selenium	7782-49-2	8.00	U	7.35	8.00	10.0	1	08/20/2021 09:48	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:48	WG1724277
Thallium	7440-28-0	5.00	U	4.31	5.00	10.0	1	08/20/2021 09:48	WG1724277
Vanadium	7440-62-2	51.9		4.99	10.0	20.0	1	08/20/2021 09:48	WG1724277
Zinc	7440-66-6	79.0		6.52	25.0	50.0	1	08/20/2021 09:48	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
TPHG C5 - C12	TPHG C5 - C12	49.4	B J	30.4	50.0	100	1	08/14/2021 21:26	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*105*				*62.0-128*		*08/14/2021 21:26*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	08/25/2021 22:04	WG1729598
Benzene	71-43-2	0.188	J	0.0941	0.500	1.00	1	08/20/2021 06:38	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 06:38	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 06:38	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 06:38	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 06:38	WG1725112
Carbon disulfide	75-15-0	0.295	J	0.0962	0.500	1.00	1	08/20/2021 06:38	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 19:14	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 06:38	WG1725112
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	08/20/2021 06:38	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 06:38	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 06:38	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 06:38	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 06:38	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 06:38	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 06:38	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 06:38	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 06:38	WG1725112
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	08/20/2021 06:38	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 06:38	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 06:38	WG1725112
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	08/20/2021 06:38	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:38	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:38	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 06:38	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 06:38	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 06:38	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 19:14	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 06:38	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 06:38	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 19:14	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 06:38	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 06:38	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 06:38	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 06:38	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 06:38	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 06:38	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 06:38	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 06:38	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 06:38	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 06:38	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:38	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 06:38	WG1725112
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	08/20/2021 06:38	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 06:38	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 19:14	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 06:38	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 06:38	WG1725112
(S) Toluene-d8	*2037-26-5*	*108*				*89.0-112*		*08/20/2021 06:38*	WG1725112
(S) Toluene-d8	*2037-26-5*	*106*				*89.0-112*		*08/24/2021 19:14*	WG1728438
(S) Toluene-d8	*2037-26-5*	*107*				*89.0-112*		*08/25/2021 22:04*	WG1729598
(S) 4-Bromofluorobenzene	*460-00-4*	*102*				*85.0-114*		*08/20/2021 06:38*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*97.7*				*85.0-114*		*08/24/2021 19:14*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*90.4*				*85.0-114*		*08/25/2021 22:04*	WG1729598
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*105*				*81.0-118*		*08/20/2021 06:38*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*108*				*81.0-118*		*08/24/2021 19:14*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*95.0*				*81.0-118*		*08/25/2021 22:04*	WG1729598

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	50.0	U	33.0	50.0	100	1	08/19/2021 01:40	WG1724076
C22-C32 Hydrocarbons	C22-C32	50.0	U	33.0	50.0	100	1	08/19/2021 01:40	WG1724076
C32-C40 Hydrocarbons	C32-C40	50.0	U	33.0	50.0	100	1	08/19/2021 01:40	WG1724076
(S) o-Terphenyl	*84-15-1*	*61.1*				*52.0-156*		*08/19/2021 01:40*	WG1724076

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.00	U	0.547	1.00	2.00	1	08/17/2021 01:49	WG1722886
Dalapon	75-99-0	1.00	U	0.344	1.00	2.00	1	08/17/2021 01:49	WG1722886
2,4-DB	94-82-6	1.00	U	0.302	1.00	2.00	1	08/17/2021 01:49	WG1722886
Dicamba	1918-00-9	1.00	U	0.245	1.00	2.00	1	08/17/2021 01:49	WG1722886
Dichloroprop	120-36-5	1.04	U	1.04	1.04	2.00	1	08/17/2021 01:49	WG1722886
Dinoseb	88-85-7	1.00	U	0.250	1.00	2.00	1	08/17/2021 01:49	WG1722886
MCPA	94-74-6	50.0	J4 U	13.1	50.0	100	1	08/17/2021 01:49	WG1722886
MCPP	93-65-2	66.0	U	66.0	66.0	100	1	08/17/2021 01:49	WG1722886
2,4,5-T	93-76-5	1.00	U	0.258	1.00	2.00	1	08/17/2021 01:49	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.00	U	0.335	1.00	2.00	1	08/17/2021 01:49	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*75.8*				*32.0-138*		*08/17/2021 01:49*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0253	U	0.0200	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Alpha BHC	319-84-6	0.0253	U	0.0174	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Beta BHC	319-85-7	0.0253	U	0.0210	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Delta BHC	319-86-8	0.0253	U	0.0152	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Gamma BHC	58-89-9	0.0253	U	0.0211	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Chlordane	57-74-9	0.253	U	0.0200	0.253	5.05	1.01	08/23/2021 04:49	WG1727077
4,4-DDD	72-54-8	0.0253	U	0.0179	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
4,4-DDE	72-55-9	0.0253	U	0.0156	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
4,4-DDT	50-29-3	0.0253	U	0.0200	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Dieldrin	60-57-1	0.0253	U	0.0164	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Endosulfan I	959-98-8	0.0253	U	0.0162	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Endosulfan II	33213-65-9	0.0253	U	0.0166	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Endosulfan sulfate	1031-07-8	0.0253	U	0.0219	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Endrin	72-20-8	0.0253	U	0.0163	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Endrin aldehyde	7421-93-4	0.0253	U	0.0239	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Endrin ketone	53494-70-5	0.0253	U	0.0221	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Heptachlor	76-44-8	0.0253	U	0.0149	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Heptachlor epoxide	1024-57-3	0.0253	U	0.0185	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Hexachlorobenzene	118-74-1	0.0253	U	0.0178	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Methoxychlor	72-43-5	0.0253	U	0.0195	0.0253	0.0505	1.01	08/23/2021 04:49	WG1727077
Toxaphene	8001-35-2	0.253	U	0.170	0.253	0.505	1.01	08/23/2021 04:49	WG1727077
(S) Decachlorobiphenyl	*2051-24-3*	*21.9*				*10.0-156*		*08/23/2021 04:49*	WG1727077
(S) Tetrachloro-m-xylene	*877-09-8*	*66.0*				*44.0-124*		*08/23/2021 04:49*	WG1727077

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	U	0.270	0.270	0.500	1	08/29/2021 21:01	WG1728813
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/29/2021 21:01	WG1728813
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/29/2021 21:01	WG1728813
PCB 1242	53469-21-9	0.273	J	0.270	0.270	0.500	1	08/29/2021 21:01	WG1728813
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/29/2021 21:01	WG1728813
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/29/2021 21:01	WG1728813
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/29/2021 21:01	WG1728813
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/29/2021 21:01	WG1728813
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/29/2021 21:01	WG1728813
(S) Decachlorobiphenyl	*2051-24-3*	*68.1*				*10.0-156*		*08/29/2021 21:01*	WG1728813
(S) Tetrachloro-m-xylene	*877-09-8*	*82.3*				*44.0-124*		*08/29/2021 21:01*	WG1728813

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Benzo(a)anthracene	56-55-3	0.0250	U	0.0200	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Benzo(a)pyrene	50-32-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Benzo(k)fluoranthene	207-08-9	0.125	U	0.0200	0.125	0.250	1	08/18/2021 13:36	WG1723610
Chrysene	218-01-9	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Dibenz(a,h)anthracene	53-70-3	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Fluoranthene	206-44-0	0.0152	J	0.0110	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 13:36	WG1723610
Phenanthrene	85-01-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
Pyrene	129-00-0	0.0172	B J	0.0170	0.0250	0.0500	1	08/18/2021 13:36	WG1723610
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 13:36	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 13:36	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*80.5*				*55.0-111*		*08/18/2021 13:36*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*73.0*				*53.0-106*		*08/18/2021 13:36*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*62.5*				*58.0-132*		*08/18/2021 13:36*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*69.5*				*50.0-150*		*08/18/2021 13:36*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*65.5*				*50.0-150*		*08/18/2021 13:36*	WG1723610

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 16:46	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 16:46	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 16:46	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 16:46	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 16:46	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 16:46	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 16:46	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 16:46	WG1724081
Caprolactam	105-60-2	2.56	J	0.309	5.00	10.0	1	08/18/2021 16:46	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 16:46	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 16:46	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 16:46	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 16:46	WG1724081
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 16:46	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 16:46	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 16:46	WG1724081
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 16:46	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 16:46	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 16:46	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 16:46	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 16:46	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 16:46	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 16:46	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 16:46	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 16:46	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 16:46	WG1724081
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 16:46	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 16:46	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 16:46	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 16:46	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 16:46	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 16:46	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 16:46	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 16:46	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 16:46	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 16:46	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 16:46	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 16:46	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 16:46	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 16:46	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 16:46	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 16:46	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 16:46	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 16:46	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 16:46	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 16:46	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 16:46	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*45.6*				*19.0-119*		*08/18/2021 16:46*	WG1724081
(S) Phenol-d5	*4165-62-2*	*29.9*				*10.0-67.0*		*08/18/2021 16:46*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*67.6*				*44.0-120*		*08/18/2021 16:46*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*72.6*				*44.0-119*		*08/18/2021 16:46*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*74.0*				*43.0-140*		*08/18/2021 16:46*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*67.0*				*50.0-134*		*08/18/2021 16:46*	WG1724081

Wet Chemistry by Method 7196A

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:57	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 10:13	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:51	WG1724277
Arsenic	7440-38-2	5.00	U	4.40	5.00	10.0	1	08/20/2021 09:51	WG1724277
Barium	7440-39-3	136		0.736	2.50	5.00	1	08/20/2021 09:51	WG1724277
Beryllium	7440-41-7	0.343	J	0.330	1.00	2.00	1	08/20/2021 09:51	WG1724277
Cadmium	7440-43-9	1.39	J	0.479	1.00	2.00	1	08/20/2021 09:51	WG1724277
Calcium	7440-70-2	95900		79.3	500	1000	1	08/20/2021 09:51	WG1724277
Chromium	7440-47-3	34.9		1.40	5.00	10.0	1	08/20/2021 09:51	WG1724277
Cobalt	7440-48-4	9.10	J	0.840	5.00	10.0	1	08/20/2021 09:51	WG1724277
Copper	7440-50-8	28.6		3.68	5.00	10.0	1	08/20/2021 09:51	WG1724277
Lead	7439-92-1	6.66		2.99	2.50	6.00	1	08/20/2021 09:51	WG1724277
Molybdenum	7439-98-7	1.29	J	1.16	2.50	5.00	1	08/20/2021 09:51	WG1724277
Nickel	7440-02-0	45.1		1.61	5.00	10.0	1	08/20/2021 09:51	WG1724277
Selenium	7782-49-2	11.7		7.35	8.00	10.0	1	08/20/2021 09:51	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:51	WG1724277
Thallium	7440-28-0	5.00	U	4.31	5.00	10.0	1	08/20/2021 09:51	WG1724277
Vanadium	7440-62-2	31.1		4.99	10.0	20.0	1	08/20/2021 09:51	WG1724277
Zinc	7440-66-6	56.5		6.52	25.0	50.0	1	08/20/2021 09:51	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
TPHG C5 - C12	TPHG C5 - C12	50.0	U	30.4	50.0	100	1	08/14/2021 21:49	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*105*				*62.0-128*		*08/14/2021 21:49*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	08/25/2021 22:25	WG1729598
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 06:57	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 06:57	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 06:57	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 06:57	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 06:57	WG1725112
Carbon disulfide	75-15-0	0.500	U	0.0962	0.500	1.00	1	08/20/2021 06:57	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 19:34	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 06:57	WG1725112
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	08/20/2021 06:57	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 06:57	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 06:57	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 06:57	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 06:57	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 06:57	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 06:57	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 06:57	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 06:57	WG1725112
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	08/20/2021 06:57	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 06:57	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 06:57	WG1725112
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	08/20/2021 06:57	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:57	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:57	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 06:57	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 06:57	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 06:57	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/20/2021 06:57	WG1725112
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 06:57	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 06:57	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 19:34	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 06:57	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 06:57	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 06:57	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 06:57	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 06:57	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 06:57	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 06:57	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 06:57	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 06:57	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 06:57	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 06:57	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 06:57	WG1725112
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	08/20/2021 06:57	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 06:57	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 19:34	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 06:57	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 06:57	WG1725112
(S) Toluene-d8	*2037-26-5*	*107*				*89.0-112*		*08/20/2021 06:57*	WG1725112
(S) Toluene-d8	*2037-26-5*	*106*				*89.0-112*		*08/24/2021 19:34*	WG1728438
(S) Toluene-d8	*2037-26-5*	*104*				*89.0-112*		*08/25/2021 22:25*	WG1729598
(S) 4-Bromofluorobenzene	*460-00-4*	*102*				*85.0-114*		*08/20/2021 06:57*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*95.1*				*85.0-114*		*08/24/2021 19:34*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*94.6*				*85.0-114*		*08/25/2021 22:25*	WG1729598
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*108*				*81.0-118*		*08/20/2021 06:57*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*103*				*81.0-118*		*08/24/2021 19:34*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*96.9*				*81.0-118*		*08/25/2021 22:25*	WG1729598

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	50.0	U	33.0	50.0	100	1	08/19/2021 02:06	WG1724076
C22-C32 Hydrocarbons	C22-C32	50.0	U	33.0	50.0	100	1	08/19/2021 02:06	WG1724076
C32-C40 Hydrocarbons	C32-C40	50.0	U	33.0	50.0	100	1	08/19/2021 02:06	WG1724076
(S) o-Terphenyl	*84-15-1*	*54.2*				*52.0-156*		*08/19/2021 02:06*	WG1724076

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.11	U	0.607	1.11	2.22	1.11	08/17/2021 02:47	WG1722886
Dalapon	75-99-0	1.11	U	0.382	1.11	2.22	1.11	08/17/2021 02:47	WG1722886
2,4-DB	94-82-6	1.11	U	0.335	1.11	2.22	1.11	08/17/2021 02:47	WG1722886
Dicamba	1918-00-9	1.11	U	0.272	1.11	2.22	1.11	08/17/2021 02:47	WG1722886
Dichloroprop	120-36-5	1.15	U	1.15	1.15	2.22	1.11	08/17/2021 02:47	WG1722886
Dinoseb	88-85-7	1.11	U	0.278	1.11	2.22	1.11	08/17/2021 02:47	WG1722886
MCPA	94-74-6	55.5	J4 U	14.5	55.5	111	1.11	08/17/2021 02:47	WG1722886
MCPP	93-65-2	73.3	U	73.3	73.3	111	1.11	08/17/2021 02:47	WG1722886
2,4,5-T	93-76-5	1.11	U	0.286	1.11	2.22	1.11	08/17/2021 02:47	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.11	U	0.372	1.11	2.22	1.11	08/17/2021 02:47	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*80.7*				*32.0-138*		*08/17/2021 02:47*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0250	U	0.0198	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Alpha BHC	319-84-6	0.0250	U	0.0172	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Beta BHC	319-85-7	0.0250	U	0.0208	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Delta BHC	319-86-8	0.0250	U	0.0150	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Gamma BHC	58-89-9	0.0250	U	0.0209	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Chlordane	57-74-9	0.250	U	0.0198	0.250	5.00	1	08/18/2021 16:34	WG1724084
4,4-DDD	72-54-8	0.0250	U	0.0177	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
4,4-DDE	72-55-9	0.0250	U	0.0154	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
4,4-DDT	50-29-3	0.0250	U	0.0198	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Dieldrin	60-57-1	0.0250	U	0.0162	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Endosulfan I	959-98-8	0.0250	U	0.0160	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Endosulfan II	33213-65-9	0.0250	U	0.0164	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Endosulfan sulfate	1031-07-8	0.0250	U	0.0217	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Endrin	72-20-8	0.0250	U	0.0161	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Endrin aldehyde	7421-93-4	0.0250	U	0.0237	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Endrin ketone	53494-70-5	0.0250	U	0.0219	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Heptachlor	76-44-8	0.0250	U	0.0148	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Heptachlor epoxide	1024-57-3	0.0250	U	0.0183	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Hexachlorobenzene	118-74-1	0.0250	U	0.0176	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Methoxychlor	72-43-5	0.0250	U	0.0193	0.0250	0.0500	1	08/18/2021 16:34	WG1724084
Toxaphene	8001-35-2	0.250	U	0.168	0.250	0.500	1	08/18/2021 16:34	WG1724084
(S) Decachlorobiphenyl	*2051-24-3*	*64.5*				*10.0-156*		*08/18/2021 16:34*	WG1724084
(S) Tetrachloro-m-xylene	*877-09-8*	*80.0*				*44.0-124*		*08/18/2021 16:34*	WG1724084

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	U	0.270	0.270	0.500	1	08/21/2021 21:48	WG1726770
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/21/2021 21:48	WG1726770
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/21/2021 21:48	WG1726770
PCB 1242	53469-21-9	0.270	U	0.270	0.270	0.500	1	08/21/2021 21:48	WG1726770
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/21/2021 21:48	WG1726770
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/21/2021 21:48	WG1726770
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/21/2021 21:48	WG1726770
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/21/2021 21:48	WG1726770
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/21/2021 21:48	WG1726770
(S) Decachlorobiphenyl	*2051-24-3*	*43.7*				*10.0-156*		*08/21/2021 21:48*	WG1726770
(S) Tetrachloro-m-xylene	*877-09-8*	*77.9*				*44.0-124*		*08/21/2021 21:48*	WG1726770

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Benzo(a)anthracene	56-55-3	0.0230	B J	0.0200	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Benzo(a)pyrene	50-32-8	0.0407	B J	0.0180	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Benzo(a)pyrene	50-32-8	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 14:59	WG1726247
Benzo(b)fluoranthene	205-99-2	0.0375	B J	0.0170	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0270	B J	0.0180	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 14:59	WG1726247
Benzo(k)fluoranthene	207-08-9	0.0361	B J	0.0200	0.125	0.250	1	08/18/2021 16:47	WG1723610
Chrysene	218-01-9	0.0186	B J	0.0180	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Dibenz(a,h)anthracene	53-70-3	0.0380	B J	0.0180	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Dibenz(a,h)anthracene	53-70-3	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 14:59	WG1726247
Fluoranthene	206-44-0	0.0182	J	0.0110	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0507	B	0.0180	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0216	B J Q	0.0180	0.0250	0.0500	1	08/22/2021 14:59	WG1726247
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 16:47	WG1723610
Phenanthrene	85-01-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
Pyrene	129-00-0	0.0198	B J	0.0170	0.0250	0.0500	1	08/18/2021 16:47	WG1723610
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 16:47	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 16:47	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*75.0*				*55.0-111*		*08/18/2021 16:47*	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*79.5*				*55.0-111*		*08/22/2021 14:59*	WG1726247
(S) 2-Fluorobiphenyl	*321-60-8*	*71.0*				*53.0-106*		*08/18/2021 16:47*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*73.0*				*53.0-106*		*08/22/2021 14:59*	WG1726247
(S) p-Terphenyl-d14	*1718-51-0*	*85.5*				*58.0-132*		*08/18/2021 16:47*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*82.5*				*58.0-132*		*08/22/2021 14:59*	WG1726247
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*68.0*				*50.0-150*		*08/18/2021 16:47*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*72.5*				*50.0-150*		*08/22/2021 14:59*	WG1726247
(S) Fluoranthene-D10	*93951-69-0*	*74.5*				*50.0-150*		*08/18/2021 16:47*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*77.0*				*50.0-150*		*08/22/2021 14:59*	WG1726247

Sample Narrative:

L1390235-09 WG1723610: Duplicate Analysis performed due to QC failure. Results don't confirm; both analyses reported

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 17:08	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 17:08	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 17:08	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 17:08	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 17:08	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 17:08	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 17:08	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 17:08	WG1724081
Caprolactam	105-60-2	2.15	J	0.309	5.00	10.0	1	08/18/2021 17:08	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 17:08	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 17:08	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 17:08	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 17:08	WG1724081
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 17:08	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 17:08	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 17:08	WG1724081
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 17:08	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 17:08	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 17:08	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 17:08	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 17:08	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 17:08	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 17:08	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 17:08	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 17:08	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 17:08	WG1724081
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 17:08	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 17:08	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 17:08	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 17:08	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 17:08	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 17:08	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 17:08	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 17:08	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 17:08	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 17:08	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 17:08	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 17:08	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 17:08	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 17:08	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 17:08	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 17:08	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 17:08	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 17:08	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 17:08	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 17:08	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 17:08	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*44.7*				*19.0-119*		*08/18/2021 17:08*	WG1724081
(S) Phenol-d5	*4165-62-2*	*31.2*				*10.0-67.0*		*08/18/2021 17:08*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*65.4*				*44.0-120*		*08/18/2021 17:08*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*72.1*				*44.0-119*		*08/18/2021 17:08*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*75.0*				*43.0-140*		*08/18/2021 17:08*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*70.0*				*50.0-134*		*08/18/2021 17:08*	WG1724081

Sample Narrative:

L1390235-09 WG1724081: Duplicate Analysis performed due to QC failure. Results don't confirm; both analyses reported

Wet Chemistry by Method 7196A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:57	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 10:15	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:54	WG1724277
Arsenic	7440-38-2	5.00	U	4.40	5.00	10.0	1	08/20/2021 09:54	WG1724277
Barium	7440-39-3	19.0		0.736	2.50	5.00	1	08/20/2021 09:54	WG1724277
Beryllium	7440-41-7	1.00	U	0.330	1.00	2.00	1	08/20/2021 09:54	WG1724277
Cadmium	7440-43-9	0.732	J	0.479	1.00	2.00	1	08/20/2021 09:54	WG1724277
Calcium	7440-70-2	75800		79.3	500	1000	1	08/20/2021 09:54	WG1724277
Chromium	7440-47-3	1.65	J	1.40	5.00	10.0	1	08/20/2021 09:54	WG1724277
Cobalt	7440-48-4	5.00	U	0.840	5.00	10.0	1	08/20/2021 09:54	WG1724277
Copper	7440-50-8	5.00	U	3.68	5.00	10.0	1	08/20/2021 09:54	WG1724277
Lead	7439-92-1	2.50	U	2.99	2.50	6.00	1	08/20/2021 09:54	WG1724277
Molybdenum	7439-98-7	2.50	U	1.16	2.50	5.00	1	08/20/2021 09:54	WG1724277
Nickel	7440-02-0	2.06	J	1.61	5.00	10.0	1	08/20/2021 09:54	WG1724277
Selenium	7782-49-2	8.00	U	7.35	8.00	10.0	1	08/20/2021 09:54	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:54	WG1724277
Thallium	7440-28-0	5.00	U	4.31	5.00	10.0	1	08/20/2021 09:54	WG1724277
Vanadium	7440-62-2	10.0	U	4.99	10.0	20.0	1	08/20/2021 09:54	WG1724277
Zinc	7440-66-6	25.0	U	6.52	25.0	50.0	1	08/20/2021 09:54	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
TPHG C5 - C12	TPHG C5 - C12	86.1	B J	30.4	50.0	100	1	08/14/2021 22:12	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*108*				*62.0-128*		*08/14/2021 22:12*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	08/25/2021 22:45	WG1729598
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 07:16	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 07:16	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 07:16	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 07:16	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 07:16	WG1725112
Carbon disulfide	75-15-0	0.500	U	0.0962	0.500	1.00	1	08/20/2021 07:16	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 19:55	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 07:16	WG1725112
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	08/20/2021 07:16	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 07:16	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 07:16	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 07:16	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 07:16	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 07:16	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 07:16	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 07:16	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 07:16	WG1725112
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	08/20/2021 07:16	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 07:16	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 07:16	WG1725112
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	08/20/2021 07:16	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 07:16	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 07:16	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 07:16	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 07:16	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 07:16	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 19:55	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 07:16	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 07:16	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 19:55	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 07:16	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 07:16	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 07:16	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 07:16	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 07:16	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 07:16	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 07:16	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 07:16	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 07:16	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 07:16	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 07:16	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 07:16	WG1725112
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	08/20/2021 07:16	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 07:16	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 19:55	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 07:16	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 07:16	WG1725112
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*08/20/2021 07:16*	WG1725112
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*08/24/2021 19:55*	WG1728438
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*08/25/2021 22:45*	WG1729598
(S) 4-Bromofluorobenzene	*460-00-4*	*101*				*85.0-114*		*08/20/2021 07:16*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*95.9*				*85.0-114*		*08/24/2021 19:55*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*91.0*				*85.0-114*		*08/25/2021 22:45*	WG1729598
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*106*				*81.0-118*		*08/20/2021 07:16*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*106*				*81.0-118*		*08/24/2021 19:55*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*97.6*				*81.0-118*		*08/25/2021 22:45*	WG1729598

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	50.0	U	33.0	50.0	100	1	08/19/2021 02:32	WG1724076
C22-C32 Hydrocarbons	C22-C32	50.0	U	33.0	50.0	100	1	08/19/2021 02:32	WG1724076
C32-C40 Hydrocarbons	C32-C40	50.0	U	33.0	50.0	100	1	08/19/2021 02:32	WG1724076
(S) o-Terphenyl	*84-15-1*	*52.2*				*52.0-156*		*08/19/2021 02:32*	WG1724076

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.05	U	0.574	1.05	2.10	1.05	08/17/2021 03:01	WG1722886
Dalapon	75-99-0	1.05	U	0.361	1.05	2.10	1.05	08/17/2021 03:01	WG1722886
2,4-DB	94-82-6	1.05	U	0.317	1.05	2.10	1.05	08/17/2021 03:01	WG1722886
Dicamba	1918-00-9	1.05	U	0.257	1.05	2.10	1.05	08/17/2021 03:01	WG1722886
Dichloroprop	120-36-5	1.09	U	1.09	1.09	2.10	1.05	08/17/2021 03:01	WG1722886
Dinoseb	88-85-7	1.05	U	0.263	1.05	2.10	1.05	08/17/2021 03:01	WG1722886
MCPA	94-74-6	52.5	J4 U	13.8	52.5	105	1.05	08/17/2021 03:01	WG1722886
MCPP	93-65-2	69.3	U	69.3	69.3	105	1.05	08/17/2021 03:01	WG1722886
2,4,5-T	93-76-5	1.05	U	0.271	1.05	2.10	1.05	08/17/2021 03:01	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.05	U	0.352	1.05	2.10	1.05	08/17/2021 03:01	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*84.6*				*32.0-138*		*08/17/2021 03:01*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0250	U	0.0198	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Alpha BHC	319-84-6	0.0250	U	0.0172	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Beta BHC	319-85-7	0.0250	U	0.0208	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Delta BHC	319-86-8	0.0250	U	0.0150	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Gamma BHC	58-89-9	0.0250	U	0.0209	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Chlordane	57-74-9	0.250	U	0.0198	0.250	5.00	1	08/18/2021 16:43	WG1724084
4,4-DDD	72-54-8	0.0250	U	0.0177	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
4,4-DDE	72-55-9	0.0250	U	0.0154	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
4,4-DDT	50-29-3	0.0250	U	0.0198	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Dieldrin	60-57-1	0.0250	U	0.0162	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Endosulfan I	959-98-8	0.0250	U	0.0160	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Endosulfan II	33213-65-9	0.0250	U	0.0164	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Endosulfan sulfate	1031-07-8	0.0250	U	0.0217	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Endrin	72-20-8	0.0250	U	0.0161	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Endrin aldehyde	7421-93-4	0.0250	U	0.0237	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Endrin ketone	53494-70-5	0.0250	U	0.0219	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Heptachlor	76-44-8	0.0250	U	0.0148	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Heptachlor epoxide	1024-57-3	0.0250	U	0.0183	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Hexachlorobenzene	118-74-1	0.0250	U	0.0176	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Methoxychlor	72-43-5	0.0250	U	0.0193	0.0250	0.0500	1	08/18/2021 16:43	WG1724084
Toxaphene	8001-35-2	0.250	U	0.168	0.250	0.500	1	08/18/2021 16:43	WG1724084
(S) Decachlorobiphenyl	*2051-24-3*	*77.2*				*10.0-156*		*08/18/2021 16:43*	WG1724084
(S) Tetrachloro-m-xylene	*877-09-8*	*70.7*				*44.0-124*		*08/18/2021 16:43*	WG1724084

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	U	0.270	0.270	0.500	1	08/21/2021 21:57	WG1726770
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/21/2021 21:57	WG1726770
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/21/2021 21:57	WG1726770
PCB 1242	53469-21-9	0.270	U	0.270	0.270	0.500	1	08/21/2021 21:57	WG1726770
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/21/2021 21:57	WG1726770
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/21/2021 21:57	WG1726770
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/21/2021 21:57	WG1726770
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/21/2021 21:57	WG1726770
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/21/2021 21:57	WG1726770
(S) Decachlorobiphenyl	*2051-24-3*	*78.9*				*10.0-156*		*08/21/2021 21:57*	WG1726770
(S) Tetrachloro-m-xylene	*877-09-8*	*75.0*				*44.0-124*		*08/21/2021 21:57*	WG1726770

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Benzo(a)anthracene	56-55-3	0.0312	B J	0.0200	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Benzo(a)anthracene	56-55-3	0.0250	Q U	0.0200	0.0250	0.0500	1	08/22/2021 15:19	WG1726247
Benzo(a)pyrene	50-32-8	0.0243	B J	0.0180	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Benzo(a)pyrene	50-32-8	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 15:19	WG1726247
Benzo(b)fluoranthene	205-99-2	0.0313	B J	0.0170	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0250	Q U	0.0170	0.0250	0.0500	1	08/22/2021 15:19	WG1726247
Benzo(g,h,i)perylene	191-24-2	0.0254	B J	0.0180	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 15:19	WG1726247
Benzo(k)fluoranthene	207-08-9	0.0216	B J	0.0200	0.125	0.250	1	08/18/2021 17:04	WG1723610
Benzo(k)fluoranthene	207-08-9	0.125	Q U	0.0200	0.125	0.250	1	08/22/2021 15:19	WG1726247
Chrysene	218-01-9	0.0235	B J	0.0180	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Chrysene	218-01-9	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 15:19	WG1726247
Dibenz(a,h)anthracene	53-70-3	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Fluoranthene	206-44-0	0.0306	J	0.0110	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Fluoranthene	206-44-0	0.0250	Q U	0.0110	0.0250	0.0500	1	08/22/2021 15:19	WG1726247
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0222	B J	0.0180	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 15:19	WG1726247
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 17:04	WG1723610
Phenanthrene	85-01-8	0.0223	B J	0.0180	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Phenanthrene	85-01-8	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 15:19	WG1726247
Pyrene	129-00-0	0.0349	B J	0.0170	0.0250	0.0500	1	08/18/2021 17:04	WG1723610
Pyrene	129-00-0	0.0250	Q U	0.0170	0.0250	0.0500	1	08/22/2021 15:19	WG1726247
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 17:04	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 17:04	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*80.0*				*55.0-111*		*08/18/2021 17:04*	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*74.0*				*55.0-111*		*08/22/2021 15:19*	WG1726247
(S) 2-Fluorobiphenyl	*321-60-8*	*78.0*				*53.0-106*		*08/18/2021 17:04*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*72.0*				*53.0-106*		*08/22/2021 15:19*	WG1726247
(S) p-Terphenyl-d14	*1718-51-0*	*99.0*				*58.0-132*		*08/18/2021 17:04*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*87.5*				*58.0-132*		*08/22/2021 15:19*	WG1726247
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*73.5*				*50.0-150*		*08/18/2021 17:04*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*70.5*				*50.0-150*		*08/22/2021 15:19*	WG1726247
(S) Fluoranthene-D10	*93951-69-0*	*83.0*				*50.0-150*		*08/18/2021 17:04*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*75.5*				*50.0-150*		*08/22/2021 15:19*	WG1726247

Sample Narrative:

L1390235-10 WG1723610, WG1726247: Duplicate Analysis performed due to QC failure. Results don't confirm; both analyses reported

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 17:30	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 17:30	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 17:30	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 17:30	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 17:30	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 17:30	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 17:30	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 17:30	WG1724081
Caprolactam	105-60-2	0.418	J	0.309	5.00	10.0	1	08/18/2021 17:30	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 17:30	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 17:30	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 17:30	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 17:30	WG1724081
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 17:30	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 17:30	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 17:30	WG1724081
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 17:30	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 17:30	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 17:30	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 17:30	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 17:30	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 17:30	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 17:30	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 17:30	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 17:30	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 17:30	WG1724081
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 17:30	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 17:30	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 17:30	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 17:30	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 17:30	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 17:30	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 17:30	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 17:30	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 17:30	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 17:30	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 17:30	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 17:30	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 17:30	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 17:30	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 17:30	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 17:30	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 17:30	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 17:30	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 17:30	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 17:30	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 17:30	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*39.8*				*19.0-119*		*08/18/2021 17:30*	WG1724081
(S) Phenol-d5	*4165-62-2*	*25.8*				*10.0-67.0*		*08/18/2021 17:30*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*58.1*				*44.0-120*		*08/18/2021 17:30*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*62.0*				*44.0-119*		*08/18/2021 17:30*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*61.0*				*43.0-140*		*08/18/2021 17:30*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*58.4*				*50.0-134*		*08/18/2021 17:30*	WG1724081

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Wet Chemistry by Method 7196A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:57	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Mercury	7439-97-6	0.150	U	0.100	0.150	0.200	1	08/18/2021 10:18	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Antimony	7440-36-0	5.00	U	4.30	5.00	10.0	1	08/20/2021 09:57	WG1724277
Arsenic	7440-38-2	5.00	U	4.40	5.00	10.0	1	08/20/2021 09:57	WG1724277
Barium	7440-39-3	6.07		0.736	2.50	5.00	1	08/20/2021 09:57	WG1724277
Beryllium	7440-41-7	1.00	U	0.330	1.00	2.00	1	08/20/2021 09:57	WG1724277
Cadmium	7440-43-9	1.44	J	0.479	1.00	2.00	1	08/20/2021 09:57	WG1724277
Calcium	7440-70-2	71400		79.3	500	1000	1	08/20/2021 09:57	WG1724277
Chromium	7440-47-3	3.67	J	1.40	5.00	10.0	1	08/20/2021 09:57	WG1724277
Cobalt	7440-48-4	5.00	U	0.840	5.00	10.0	1	08/20/2021 09:57	WG1724277
Copper	7440-50-8	5.00	U	3.68	5.00	10.0	1	08/20/2021 09:57	WG1724277
Lead	7439-92-1	2.50	U	2.99	2.50	6.00	1	08/20/2021 09:57	WG1724277
Molybdenum	7439-98-7	2.65	J	1.16	2.50	5.00	1	08/20/2021 09:57	WG1724277
Nickel	7440-02-0	3.24	J	1.61	5.00	10.0	1	08/20/2021 09:57	WG1724277
Selenium	7782-49-2	8.00	U	7.35	8.00	10.0	1	08/20/2021 09:57	WG1724277
Silver	7440-22-4	2.50	U	1.54	2.50	5.00	1	08/20/2021 09:57	WG1724277
Thallium	7440-28-0	5.00	U	4.31	5.00	10.0	1	08/20/2021 09:57	WG1724277
Vanadium	7440-62-2	10.0	U	4.99	10.0	20.0	1	08/20/2021 09:57	WG1724277
Zinc	7440-66-6	11.7	J	6.52	25.0	50.0	1	08/20/2021 09:57	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
TPHG C5 - C12	TPHG C5 - C12	50.0	U	30.4	50.0	100	1	08/14/2021 22:35	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*105*				*62.0-128*		*08/14/2021 22:35*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	08/25/2021 23:05	WG1729598
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 07:35	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 07:35	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 07:35	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 07:35	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 07:35	WG1725112
Carbon disulfide	75-15-0	0.500	U	0.0962	0.500	1.00	1	08/20/2021 07:35	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 20:15	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 07:35	WG1725112
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	08/20/2021 07:35	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 07:35	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 07:35	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 07:35	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 07:35	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 07:35	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 07:35	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 07:35	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 07:35	WG1725112
1,1-Dichloroethane	75-34-3	0.128	J	0.100	0.500	1.00	1	08/20/2021 07:35	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 07:35	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 07:35	WG1725112
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	08/20/2021 07:35	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 07:35	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 07:35	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 07:35	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 07:35	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 07:35	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 20:15	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 07:35	WG1725112
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	08/20/2021 07:35	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 20:15	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 07:35	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 07:35	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 07:35	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 07:35	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 07:35	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 07:35	WG1725112
Tetrachloroethene	127-18-4	0.334	J	0.300	0.500	1.00	1	08/20/2021 07:35	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 07:35	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 07:35	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 07:35	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 07:35	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 07:35	WG1725112
Trichloroethene	79-01-6	0.250	J	0.190	0.500	1.00	1	08/20/2021 07:35	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 07:35	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 20:15	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 07:35	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 07:35	WG1725112
(S) Toluene-d8	*2037-26-5*	*107*				*89.0-112*		*08/20/2021 07:35*	WG1725112
(S) Toluene-d8	*2037-26-5*	*109*				*89.0-112*		*08/24/2021 20:15*	WG1728438
(S) Toluene-d8	*2037-26-5*	*104*				*89.0-112*		*08/25/2021 23:05*	WG1729598
(S) 4-Bromofluorobenzene	*460-00-4*	*103*				*85.0-114*		*08/20/2021 07:35*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*97.8*				*85.0-114*		*08/24/2021 20:15*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*91.4*				*85.0-114*		*08/25/2021 23:05*	WG1729598
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*107*				*81.0-118*		*08/20/2021 07:35*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*104*				*81.0-118*		*08/24/2021 20:15*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*98.2*				*81.0-118*		*08/25/2021 23:05*	WG1729598

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	50.0	U	33.0	50.0	100	1	08/19/2021 02:58	WG1724076
C22-C32 Hydrocarbons	C22-C32	50.0	U	33.0	50.0	100	1	08/19/2021 02:58	WG1724076
C32-C40 Hydrocarbons	C32-C40	50.0	U	33.0	50.0	100	1	08/19/2021 02:58	WG1724076
(S) o-Terphenyl	*84-15-1*	*57.4*				*52.0-156*		*08/19/2021 02:58*	WG1724076

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.00	U	0.547	1.00	2.00	1	08/17/2021 03:16	WG1722886
Dalapon	75-99-0	1.00	U	0.344	1.00	2.00	1	08/17/2021 03:16	WG1722886
2,4-DB	94-82-6	1.00	U	0.302	1.00	2.00	1	08/17/2021 03:16	WG1722886
Dicamba	1918-00-9	1.00	U	0.245	1.00	2.00	1	08/17/2021 03:16	WG1722886
Dichloroprop	120-36-5	1.04	U	1.04	1.04	2.00	1	08/17/2021 03:16	WG1722886
Dinoseb	88-85-7	1.00	U	0.250	1.00	2.00	1	08/17/2021 03:16	WG1722886
MCPA	94-74-6	50.0	J4 U	13.1	50.0	100	1	08/17/2021 03:16	WG1722886
MCPP	93-65-2	66.0	U	66.0	66.0	100	1	08/17/2021 03:16	WG1722886
2,4,5-T	93-76-5	1.00	U	0.258	1.00	2.00	1	08/17/2021 03:16	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.00	U	0.335	1.00	2.00	1	08/17/2021 03:16	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*83.0*				*32.0-138*		*08/17/2021 03:16*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0250	U	0.0198	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Alpha BHC	319-84-6	0.0250	U	0.0172	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Beta BHC	319-85-7	0.0250	U	0.0208	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Delta BHC	319-86-8	0.0250	U	0.0150	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Gamma BHC	58-89-9	0.0250	U	0.0209	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Chlordane	57-74-9	0.250	U	0.0198	0.250	5.00	1	08/18/2021 16:52	WG1724084
4,4-DDD	72-54-8	0.0250	U	0.0177	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
4,4-DDE	72-55-9	0.0250	U	0.0154	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
4,4-DDT	50-29-3	0.0250	U	0.0198	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Dieldrin	60-57-1	0.0250	U	0.0162	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Endosulfan I	959-98-8	0.0250	U	0.0160	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Endosulfan II	33213-65-9	0.0250	U	0.0164	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Endosulfan sulfate	1031-07-8	0.0250	U	0.0217	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Endrin	72-20-8	0.0250	U	0.0161	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Endrin aldehyde	7421-93-4	0.0250	U	0.0237	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Endrin ketone	53494-70-5	0.0250	U	0.0219	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Heptachlor	76-44-8	0.0250	U	0.0148	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Heptachlor epoxide	1024-57-3	0.0250	U	0.0183	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Hexachlorobenzene	118-74-1	0.0250	U	0.0176	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Methoxychlor	72-43-5	0.0250	U	0.0193	0.0250	0.0500	1	08/18/2021 16:52	WG1724084
Toxaphene	8001-35-2	0.250	U	0.168	0.250	0.500	1	08/18/2021 16:52	WG1724084
(S) Decachlorobiphenyl	*2051-24-3*	*83.9*				*10.0-156*		*08/18/2021 16:52*	WG1724084
(S) Tetrachloro-m-xylene	*877-09-8*	*75.5*				*44.0-124*		*08/18/2021 16:52*	WG1724084

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	U	0.270	0.270	0.500	1	08/21/2021 22:06	WG1726770
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/21/2021 22:06	WG1726770
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/21/2021 22:06	WG1726770
PCB 1242	53469-21-9	0.270	U	0.270	0.270	0.500	1	08/21/2021 22:06	WG1726770
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/21/2021 22:06	WG1726770
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/21/2021 22:06	WG1726770
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/21/2021 22:06	WG1726770
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/21/2021 22:06	WG1726770
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/21/2021 22:06	WG1726770
(S) Decachlorobiphenyl	*2051-24-3*	*17.9*				*10.0-156*		*08/21/2021 22:06*	WG1726770
(S) Tetrachloro-m-xylene	*877-09-8*	*78.8*				*44.0-124*		*08/21/2021 22:06*	WG1726770

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Benzo(a)anthracene	56-55-3	0.0221	B J	0.0200	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Benzo(a)pyrene	50-32-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0174	B J	0.0170	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0237	B J Q	0.0180	0.0250	0.0500	1	08/22/2021 15:39	WG1726247
Benzo(k)fluoranthene	207-08-9	0.125	U	0.0200	0.125	0.250	1	08/18/2021 17:21	WG1723610
Chrysene	218-01-9	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Dibenz(a,h)anthracene	53-70-3	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Fluoranthene	206-44-0	0.0202	J	0.0110	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 17:21	WG1723610
Phenanthrene	85-01-8	0.0195	B J	0.0180	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
Phenanthrene	85-01-8	0.0250	Q U	0.0180	0.0250	0.0500	1	08/22/2021 15:39	WG1726247
Pyrene	129-00-0	0.0251	B J	0.0170	0.0250	0.0500	1	08/18/2021 17:21	WG1723610
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 17:21	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 17:21	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*75.5*				*55.0-111*		*08/18/2021 17:21*	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*81.0*				*55.0-111*		*08/22/2021 15:39*	WG1726247
(S) 2-Fluorobiphenyl	*321-60-8*	*70.5*				*53.0-106*		*08/18/2021 17:21*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*78.0*				*53.0-106*		*08/22/2021 15:39*	WG1726247
(S) p-Terphenyl-d14	*1718-51-0*	*84.0*				*58.0-132*		*08/18/2021 17:21*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*94.5*				*58.0-132*		*08/22/2021 15:39*	WG1726247
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*68.0*				*50.0-150*		*08/18/2021 17:21*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*76.0*				*50.0-150*		*08/22/2021 15:39*	WG1726247
(S) Fluoranthene-D10	*93951-69-0*	*68.5*				*50.0-150*		*08/18/2021 17:21*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*80.5*				*50.0-150*		*08/22/2021 15:39*	WG1726247

Sample Narrative:

L1390235-11 WG1723610, WG1726247: Duplicate Analysis performed due to QC failure. Results don't confirm; both analyses reported

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 17:51	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 17:51	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 17:51	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 17:51	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 17:51	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 17:51	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 17:51	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 17:51	WG1724081
Caprolactam	105-60-2	2.93	J	0.309	5.00	10.0	1	08/18/2021 17:51	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 17:51	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 17:51	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 17:51	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 17:51	WG1724081
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 17:51	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 17:51	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 17:51	WG1724081
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 17:51	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 17:51	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 17:51	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 17:51	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 17:51	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 17:51	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 17:51	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 17:51	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 17:51	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 17:51	WG1724081
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 17:51	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 17:51	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 17:51	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 17:51	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 17:51	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 17:51	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 17:51	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 17:51	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0	1	08/18/2021 17:51	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 17:51	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 17:51	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 17:51	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 17:51	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 17:51	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 17:51	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 17:51	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 17:51	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 17:51	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 17:51	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 17:51	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 17:51	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*43.0*				*19.0-119*		*08/18/2021 17:51*	WG1724081
(S) Phenol-d5	*4165-62-2*	*29.1*				*10.0-67.0*		*08/18/2021 17:51*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*60.9*				*44.0-120*		*08/18/2021 17:51*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*68.1*				*44.0-119*		*08/18/2021 17:51*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*68.5*				*43.0-140*		*08/18/2021 17:51*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*65.3*				*50.0-134*		*08/18/2021 17:51*	WG1724081

Wet Chemistry by Method 7196A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chromium,Hexavalent	18540-29-9	5.00	T8 U	3.00	5.00	10.0	1	08/14/2021 00:57	WG1723000

Mercury by Method 7470A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Mercury	7439-97-6	0.213		0.100	0.150	0.200	1	08/18/2021 10:20	WG1724045

Metals (ICP) by Method 6010B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Antimony	7440-36-0	25.0	U	21.5	25.0	50.0	5	08/20/2021 14:24	WG1724277
Arsenic	7440-38-2	46.1	J	22.0	25.0	50.0	5	08/20/2021 14:24	WG1724277
Barium	7440-39-3	979		3.68	12.5	25.0	5	08/20/2021 14:24	WG1724277
Beryllium	7440-41-7	2.59	J	1.65	5.00	10.0	5	08/20/2021 14:24	WG1724277
Cadmium	7440-43-9	17.4		2.40	5.00	10.0	5	08/20/2021 14:24	WG1724277
Calcium	7440-70-2	909000		396	2500	5000	5	08/20/2021 14:24	WG1724277
Chromium	7440-47-3	306		7.00	25.0	50.0	5	08/20/2021 14:24	WG1724277
Cobalt	7440-48-4	80.6		4.20	25.0	50.0	5	08/20/2021 14:24	WG1724277
Copper	7440-50-8	459		18.4	25.0	50.0	5	08/20/2021 14:24	WG1724277
Lead	7439-92-1	42.3		15.0	12.5	30.0	5	08/20/2021 14:24	WG1724277
Molybdenum	7439-98-7	12.5	U	5.80	12.5	25.0	5	08/20/2021 14:24	WG1724277
Nickel	7440-02-0	403		8.05	25.0	50.0	5	08/20/2021 14:24	WG1724277
Selenium	7782-49-2	119		36.8	40.0	50.0	5	08/20/2021 14:24	WG1724277
Silver	7440-22-4	12.5	U	7.70	12.5	25.0	5	08/20/2021 14:24	WG1724277
Thallium	7440-28-0	25.0	U	21.6	25.0	50.0	5	08/20/2021 14:24	WG1724277
Vanadium	7440-62-2	317		25.0	50.0	100	5	08/20/2021 14:24	WG1724277
Zinc	7440-66-6	661		32.6	125	250	5	08/20/2021 14:24	WG1724277

Volatile Organic Compounds (GC) by Method 8015

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
TPHG C5 - C12	TPHG C5 - C12	50.0	U	30.4	50.0	100	1	08/14/2021 22:58	WG1723166
(S) a,a,a-Trifluorotoluene(FID)	*98-08-8*	*106*				*62.0-128*		*08/14/2021 22:58*	WG1723166

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	08/25/2021 23:26	WG1729598
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	08/20/2021 07:54	WG1725112
Bromochloromethane	74-97-5	0.500	U	0.128	0.500	1.00	1	08/20/2021 07:54	WG1725112
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	08/20/2021 07:54	WG1725112
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	08/20/2021 07:54	WG1725112
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	08/20/2021 07:54	WG1725112
Carbon disulfide	75-15-0	0.253	J	0.0962	0.500	1.00	1	08/20/2021 07:54	WG1725112
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	08/24/2021 20:35	WG1728438
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	08/20/2021 07:54	WG1725112
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	08/20/2021 07:54	WG1725112
Chloromethane	74-87-3	1.00	U	0.960	1.00	2.50	1	08/20/2021 07:54	WG1725112
Cyclohexane	110-82-7	1.00	U	0.188	1.00	1.00	1	08/20/2021 07:54	WG1725112
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	08/20/2021 07:54	WG1725112
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	08/20/2021 07:54	WG1725112
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	08/20/2021 07:54	WG1725112
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	08/20/2021 07:54	WG1725112

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	08/20/2021 07:54	WG1725112
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	08/20/2021 07:54	WG1725112
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	08/20/2021 07:54	WG1725112
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	08/20/2021 07:54	WG1725112
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	08/20/2021 07:54	WG1725112
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	08/20/2021 07:54	WG1725112
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 07:54	WG1725112
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	08/20/2021 07:54	WG1725112
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	08/20/2021 07:54	WG1725112
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	08/20/2021 07:54	WG1725112
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	08/20/2021 07:54	WG1725112
2-Hexanone	591-78-6	5.00	U	0.787	5.00	10.0	1	08/24/2021 20:35	WG1728438
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	08/20/2021 07:54	WG1725112
2-Butanone (MEK)	78-93-3	2.37	J	1.19	5.00	10.0	1	08/20/2021 07:54	WG1725112
Methyl Acetate	79-20-9	5.00	U	1.29	5.00	20.0	1	08/24/2021 20:35	WG1728438
Methyl Cyclohexane	108-87-2	0.660	U	0.660	0.660	1.00	1	08/20/2021 07:54	WG1725112
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	08/20/2021 07:54	WG1725112
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	08/20/2021 07:54	WG1725112
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	08/20/2021 07:54	WG1725112
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	08/20/2021 07:54	WG1725112
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	08/20/2021 07:54	WG1725112
Tetrachloroethene	127-18-4	0.500	U	0.300	0.500	1.00	1	08/20/2021 07:54	WG1725112
Toluene	108-88-3	0.500	U	0.278	0.500	1.00	1	08/20/2021 07:54	WG1725112
1,2,3-Trichlorobenzene	87-61-6	0.500	U	0.230	0.500	1.00	1	08/20/2021 07:54	WG1725112
1,2,4-Trichlorobenzene	120-82-1	0.500	U	0.481	0.500	1.00	1	08/20/2021 07:54	WG1725112
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	08/20/2021 07:54	WG1725112
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	08/20/2021 07:54	WG1725112
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	08/20/2021 07:54	WG1725112
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	08/20/2021 07:54	WG1725112
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	08/24/2021 20:35	WG1728438
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	08/20/2021 07:54	WG1725112
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	08/20/2021 07:54	WG1725112
(S) Toluene-d8	*2037-26-5*	*106*				*89.0-112*		*08/20/2021 07:54*	WG1725112
(S) Toluene-d8	*2037-26-5*	*106*				*89.0-112*		*08/24/2021 20:35*	WG1728438
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*08/25/2021 23:26*	WG1729598
(S) 4-Bromofluorobenzene	*460-00-4*	*101*				*85.0-114*		*08/20/2021 07:54*	WG1725112
(S) 4-Bromofluorobenzene	*460-00-4*	*94.3*				*85.0-114*		*08/24/2021 20:35*	WG1728438
(S) 4-Bromofluorobenzene	*460-00-4*	*92.8*				*85.0-114*		*08/25/2021 23:26*	WG1729598
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*108*				*81.0-118*		*08/20/2021 07:54*	WG1725112
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*104*				*81.0-118*		*08/24/2021 20:35*	WG1728438
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*99.1*				*81.0-118*		*08/25/2021 23:26*	WG1729598

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
C12-C22 Hydrocarbons	C12-C22	50.0	U	33.0	50.0	100	1	08/19/2021 03:24	WG1724076
C22-C32 Hydrocarbons	C22-C32	50.0	U	33.0	50.0	100	1	08/19/2021 03:24	WG1724076
C32-C40 Hydrocarbons	C32-C40	50.0	U	33.0	50.0	100	1	08/19/2021 03:24	WG1724076
(S) o-Terphenyl	*84-15-1*	*32.7*	J2			*52.0-156*		*08/19/2021 03:24*	WG1724076

Sample Narrative:

L1390235-12 WG1724076: Sample produced emulsion during Extraction process, low surr/spike recoveries due to matrix.

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
2,4-D	94-75-7	1.25	U	0.684	1.25	2.50	1.25	08/17/2021 03:30	WG1722886
Dalapon	75-99-0	1.25	U	0.430	1.25	2.50	1.25	08/17/2021 03:30	WG1722886
2,4-DB	94-82-6	1.25	U	0.378	1.25	2.50	1.25	08/17/2021 03:30	WG1722886
Dicamba	1918-00-9	1.25	U	0.306	1.25	2.50	1.25	08/17/2021 03:30	WG1722886
Dichloroprop	120-36-5	1.30	U	1.30	1.30	2.50	1.25	08/17/2021 03:30	WG1722886
Dinoseb	88-85-7	1.25	U	0.313	1.25	2.50	1.25	08/17/2021 03:30	WG1722886
MCPA	94-74-6	62.5	J4 U	16.4	62.5	125	1.25	08/17/2021 03:30	WG1722886
MCPP	93-65-2	82.5	U	82.5	82.5	125	1.25	08/17/2021 03:30	WG1722886
2,4,5-T	93-76-5	1.25	U	0.322	1.25	2.50	1.25	08/17/2021 03:30	WG1722886
2,4,5-TP (Silvex)	93-72-1	1.25	U	0.419	1.25	2.50	1.25	08/17/2021 03:30	WG1722886
(S) 2,4-Dichlorophenyl Acetic Acid	*19719-28-9*	*79.7*				*32.0-138*		*08/17/2021 03:30*	WG1722886

Pesticides (GC) by Method 8081

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Aldrin	309-00-2	0.0250	U	0.0198	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Alpha BHC	319-84-6	0.0250	U	0.0172	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Beta BHC	319-85-7	0.0250	U	0.0208	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Delta BHC	319-86-8	0.0250	U	0.0150	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Gamma BHC	58-89-9	0.0250	U	0.0209	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Chlordane	57-74-9	0.250	U	0.0198	0.250	5.00	1	08/18/2021 17:00	WG1724084
4,4-DDD	72-54-8	0.0250	U	0.0177	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
4,4-DDE	72-55-9	0.0250	U	0.0154	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
4,4-DDT	50-29-3	0.0250	U	0.0198	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Dieldrin	60-57-1	0.0250	U	0.0162	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Endosulfan I	959-98-8	0.0250	U	0.0160	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Endosulfan II	33213-65-9	0.0250	U	0.0164	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Endosulfan sulfate	1031-07-8	0.0250	U	0.0217	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Endrin	72-20-8	0.0250	U	0.0161	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Endrin aldehyde	7421-93-4	0.0250	U	0.0237	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Endrin ketone	53494-70-5	0.0250	U	0.0219	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Heptachlor	76-44-8	0.0250	U	0.0148	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Heptachlor epoxide	1024-57-3	0.0250	U	0.0183	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Hexachlorobenzene	118-74-1	0.0250	U	0.0176	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Methoxychlor	72-43-5	0.0250	U	0.0193	0.0250	0.0500	1	08/18/2021 17:00	WG1724084
Toxaphene	8001-35-2	0.250	U	0.168	0.250	0.500	1	08/18/2021 17:00	WG1724084
(S) Decachlorobiphenyl	*2051-24-3*	*69.8*				*10.0-156*		*08/18/2021 17:00*	WG1724084
(S) Tetrachloro-m-xylene	*877-09-8*	*82.2*				*44.0-124*		*08/18/2021 17:00*	WG1724084

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
PCB 1016	12674-11-2	0.270	U	0.270	0.270	0.500	1	08/21/2021 22:15	WG1726770
PCB 1221	11104-28-2	0.270	U	0.270	0.270	0.500	1	08/21/2021 22:15	WG1726770
PCB 1232	11141-16-5	0.270	U	0.270	0.270	0.500	1	08/21/2021 22:15	WG1726770
PCB 1242	53469-21-9	0.270	U	0.270	0.270	0.500	1	08/21/2021 22:15	WG1726770
PCB 1248	12672-29-6	0.250	U	0.173	0.250	0.500	1	08/21/2021 22:15	WG1726770
PCB 1254	11097-69-1	0.250	U	0.173	0.250	0.500	1	08/21/2021 22:15	WG1726770
PCB 1260	11096-82-5	0.250	U	0.173	0.250	0.500	1	08/21/2021 22:15	WG1726770
PCB 1262	37324-23-5	0.250	U	0.173	0.250	0.500	1	08/21/2021 22:15	WG1726770
PCB 1268	11100-14-4	0.250	U	0.173	0.250	0.500	1	08/21/2021 22:15	WG1726770
(S) Decachlorobiphenyl	*2051-24-3*	*62.3*				*10.0-156*		*08/21/2021 22:15*	WG1726770
(S) Tetrachloro-m-xylene	*877-09-8*	*81.5*				*44.0-124*		*08/21/2021 22:15*	WG1726770

Semi Volatile Organic Compounds (GC/MS) by Method 8270 C-SIM

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Anthracene	120-12-7	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Acenaphthene	83-32-9	0.0250	U	0.0190	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Acenaphthylene	208-96-8	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Benzo(a)anthracene	56-55-3	0.0250	U	0.0200	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Benzo(a)anthracene	56-55-3	0.0256	B J Q	0.0200	0.0250	0.0500	1	08/22/2021 15:59	WG1726247
Benzo(a)pyrene	50-32-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Benzo(a)pyrene	50-32-8	0.0223	B J Q	0.0180	0.0250	0.0500	1	08/22/2021 15:59	WG1726247
Benzo(b)fluoranthene	205-99-2	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Benzo(b)fluoranthene	205-99-2	0.0379	B J Q	0.0170	0.0250	0.0500	1	08/22/2021 15:59	WG1726247
Benzo(g,h,i)perylene	191-24-2	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Benzo(g,h,i)perylene	191-24-2	0.0206	B J Q	0.0180	0.0250	0.0500	1	08/22/2021 15:59	WG1726247
Benzo(k)fluoranthene	207-08-9	0.125	U	0.0200	0.125	0.250	1	08/18/2021 17:39	WG1723610
Benzo(k)fluoranthene	207-08-9	0.0249	B J Q	0.0200	0.125	0.250	1	08/22/2021 15:59	WG1726247
Chrysene	218-01-9	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Chrysene	218-01-9	0.0318	B J Q	0.0180	0.0250	0.0500	1	08/22/2021 15:59	WG1726247
Dibenz(a,h)anthracene	53-70-3	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Fluoranthene	206-44-0	0.0124	J	0.0110	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Fluorene	86-73-7	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Indeno(1,2,3-cd)pyrene	193-39-5	0.0332	B J Q	0.0180	0.0250	0.0500	1	08/22/2021 15:59	WG1726247
Naphthalene	91-20-3	0.250	U	0.128	0.250	0.500	1	08/18/2021 17:39	WG1723610
Phenanthrene	85-01-8	0.0250	U	0.0180	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Pyrene	129-00-0	0.0250	U	0.0170	0.0250	0.0500	1	08/18/2021 17:39	WG1723610
Pyrene	129-00-0	0.0269	B J Q	0.0170	0.0250	0.0500	1	08/22/2021 15:59	WG1726247
2-Methylnaphthalene	91-57-6	0.250	U	0.0280	0.250	0.500	1	08/18/2021 17:39	WG1723610
2-Chloronaphthalene	91-58-7	0.250	U	0.0120	0.250	0.500	1	08/18/2021 17:39	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*25.9*	J2			*55.0-111*		*08/18/2021 17:39*	WG1723610
(S) Nitrobenzene-d5	*4165-60-0*	*85.0*				*55.0-111*		*08/22/2021 15:59*	WG1726247
(S) 2-Fluorobiphenyl	*321-60-8*	*15.2*	J2			*53.0-106*		*08/18/2021 17:39*	WG1723610
(S) 2-Fluorobiphenyl	*321-60-8*	*82.0*				*53.0-106*		*08/22/2021 15:59*	WG1726247
(S) p-Terphenyl-d14	*1718-51-0*	*7.00*	J2			*58.0-132*		*08/18/2021 17:39*	WG1723610
(S) p-Terphenyl-d14	*1718-51-0*	*103*				*58.0-132*		*08/22/2021 15:59*	WG1726247
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*14.2*	J2			*50.0-150*		*08/18/2021 17:39*	WG1723610
(S) 2-Methylnaphthalene-D10	*7297-45-2*	*80.5*				*50.0-150*		*08/22/2021 15:59*	WG1726247
(S) Fluoranthene-D10	*93951-69-0*	*2.34*	J2			*50.0-150*		*08/18/2021 17:39*	WG1723610
(S) Fluoranthene-D10	*93951-69-0*	*83.5*				*50.0-150*		*08/22/2021 15:59*	WG1726247

Sample Narrative:

L1390235-12 WG1723610, WG1726247: Duplicate Analysis performed due to surrogate failure. Results don't confirm; both analyses reported

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetophenone	98-86-2	5.00	U	0.208	5.00	10.0	1	08/18/2021 19:18	WG1724081
Atrazine	1912-24-9	5.00	U	0.255	5.00	10.0	1	08/18/2021 19:18	WG1724081
Benzaldehyde	100-52-7	5.00	C6 J4 U	1.69	5.00	10.0	1	08/18/2021 19:18	WG1724081
Biphenyl	92-52-4	5.00	U	0.790	5.00	10.0	1	08/18/2021 19:18	WG1724081
Bis(2-chlorethoxy)methane	111-91-1	5.00	U	0.116	5.00	10.0	1	08/18/2021 19:18	WG1724081
Bis(2-chloroethyl)ether	111-44-4	5.00	U	0.137	5.00	10.0	1	08/18/2021 19:18	WG1724081
2,2-Oxybis(1-Chloropropane)	108-60-1	5.00	U	0.210	5.00	10.0	1	08/18/2021 19:18	WG1724081
4-Bromophenyl-phenylether	101-55-3	5.00	U	0.0877	5.00	10.0	1	08/18/2021 19:18	WG1724081
Caprolactam	105-60-2	5.00	U	0.309	5.00	10.0	1	08/18/2021 19:18	WG1724081
Carbazole	86-74-8	5.00	U	0.111	5.00	10.0	1	08/18/2021 19:18	WG1724081
4-Chloroaniline	106-47-8	5.00	U	0.234	5.00	10.0	1	08/18/2021 19:18	WG1724081
4-Chlorophenyl-phenylether	7005-72-3	5.00	U	0.0926	5.00	10.0	1	08/18/2021 19:18	WG1724081
3,3-Dichlorobenzidine	91-94-1	5.00	U	0.212	5.00	10.0	1	08/18/2021 19:18	WG1724081

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
2,4-Dinitrotoluene	121-14-2	5.00	U	0.0983	5.00	10.0	1	08/18/2021 19:18	WG1724081
2,6-Dinitrotoluene	606-20-2	5.00	U	0.250	5.00	10.0	1	08/18/2021 19:18	WG1724081
Hexachlorobenzene	118-74-1	0.500	U	0.0755	0.500	1.00	1	08/18/2021 19:18	WG1724081
Hexachloro-1,3-butadiene	87-68-3	5.00	U	0.0968	5.00	10.0	1	08/18/2021 19:18	WG1724081
Hexachlorocyclopentadiene	77-47-4	5.00	U	0.0598	5.00	10.0	1	08/18/2021 19:18	WG1724081
Hexachloroethane	67-72-1	5.00	U	0.127	5.00	10.0	1	08/18/2021 19:18	WG1724081
Isophorone	78-59-1	5.00	U	0.143	5.00	10.0	1	08/18/2021 19:18	WG1724081
Nitrobenzene	98-95-3	5.00	U	0.297	5.00	10.0	1	08/18/2021 19:18	WG1724081
n-Nitrosodiphenylamine	86-30-6	5.00	U	2.37	5.00	10.0	1	08/18/2021 19:18	WG1724081
n-Nitrosodi-n-propylamine	621-64-7	5.00	U	0.261	5.00	10.0	1	08/18/2021 19:18	WG1724081
Benzylbutyl phthalate	85-68-7	1.50	U	0.765	1.50	3.00	1	08/18/2021 19:18	WG1724081
Bis(2-Ethylhexyl)phthalate	117-81-7	1.50	U	0.895	1.50	3.00	1	08/18/2021 19:18	WG1724081
Di-n-butyl phthalate	84-74-2	1.50	U	0.453	1.50	3.00	1	08/18/2021 19:18	WG1724081
Diethyl phthalate	84-66-2	1.50	U	0.287	1.50	3.00	1	08/18/2021 19:18	WG1724081
Dimethyl phthalate	131-11-3	1.50	U	0.260	1.50	3.00	1	08/18/2021 19:18	WG1724081
Di-n-octyl phthalate	117-84-0	1.50	U	0.932	1.50	3.00	1	08/18/2021 19:18	WG1724081
2-Nitroaniline	88-74-4	1.50	U	0.102	1.50	10.0	1	08/18/2021 19:18	WG1724081
3-Nitroaniline	99-09-2	1.50	U	0.0869	1.50	10.0	1	08/18/2021 19:18	WG1724081
4-Nitroaniline	100-01-6	1.50	U	0.0910	1.50	10.0	1	08/18/2021 19:18	WG1724081
1,2,4,5-Tetrachlorobenzene	95-94-3	1.50	U	0.0647	1.50	10.0	1	08/18/2021 19:18	WG1724081
2-Methylphenol	95-48-7	5.00	U	0.929	5.00	10.0	1	08/18/2021 19:18	WG1724081
3&4-Methyl Phenol	3&4-Methyl Phenol	0.280	J	0.168	5.00	10.0	1	08/18/2021 19:18	WG1724081
4-Chloro-3-methylphenol	59-50-7	5.00	U	0.131	5.00	10.0	1	08/18/2021 19:18	WG1724081
2-Chlorophenol	95-57-8	5.00	U	0.133	5.00	10.0	1	08/18/2021 19:18	WG1724081
2,4-Dichlorophenol	120-83-2	5.00	U	0.102	5.00	10.0	1	08/18/2021 19:18	WG1724081
2,4-Dimethylphenol	105-67-9	5.00	U	0.0636	5.00	10.0	1	08/18/2021 19:18	WG1724081
4,6-Dinitro-2-methylphenol	534-52-1	5.00	U	1.12	5.00	10.0	1	08/18/2021 19:18	WG1724081
2,4-Dinitrophenol	51-28-5	5.93	U	5.93	5.93	10.0	1	08/18/2021 19:18	WG1724081
2-Nitrophenol	88-75-5	5.00	U	0.117	5.00	10.0	1	08/18/2021 19:18	WG1724081
4-Nitrophenol	100-02-7	5.00	U	0.143	5.00	10.0	1	08/18/2021 19:18	WG1724081
Pentachlorophenol	87-86-5	5.00	U	0.313	5.00	10.0	1	08/18/2021 19:18	WG1724081
Phenol	108-95-2	5.00	U	4.33	5.00	10.0	1	08/18/2021 19:18	WG1724081
2,4,5-Trichlorophenol	95-95-4	5.00	U	0.109	5.00	10.0	1	08/18/2021 19:18	WG1724081
2,4,6-Trichlorophenol	88-06-2	5.00	U	0.100	5.00	10.0	1	08/18/2021 19:18	WG1724081
(S) 2-Fluorophenol	*367-12-4*	*46.9*				*19.0-119*		*08/18/2021 19:18*	WG1724081
(S) Phenol-d5	*4165-62-2*	*33.5*				*10.0-67.0*		*08/18/2021 19:18*	WG1724081
(S) Nitrobenzene-d5	*4165-60-0*	*67.9*				*44.0-120*		*08/18/2021 19:18*	WG1724081
(S) 2-Fluorobiphenyl	*321-60-8*	*73.0*				*44.0-119*		*08/18/2021 19:18*	WG1724081
(S) 2,4,6-Tribromophenol	*118-79-6*	*76.0*				*43.0-140*		*08/18/2021 19:18*	WG1724081
(S) p-Terphenyl-d14	*1718-51-0*	*66.8*				*50.0-134*		*08/18/2021 19:18*	WG1724081

Method Blank (MB)

(MB) R3691938-1 08/14/21 00:51

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Chromium,Hexavalent	5.00	U	3.00	5.00	10.0

L1390189-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1390189-01 08/14/21 00:51 • (DUP) R3691938-3 08/14/21 00:51

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	5.00	5.00	1	0.000	U	20

L1390468-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1390468-01 08/14/21 01:00 • (DUP) R3691938-6 08/14/21 01:00

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	5.00	5.00	1	0.000	U	20

Laboratory Control Sample (LCS)

(LCS) R3691938-2 08/14/21 00:51

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Hexavalent	500	495	99.0	90.0-111	

L1390235-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390235-08 08/14/21 00:55 • (MS) R3691938-4 08/14/21 00:56 • (MSD) R3691938-5 08/14/21 00:57

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chromium,Hexavalent	500	5.00	481	494	96.2	98.8	1	90.0-111			2.67	20

QUALITY CONTROL SUMMARY

L1390235-01,02,03,04,05,06,07,08,09,10,11,12

Method Blank (MB)

(MB) R3693315-1 08/18/21 09:18

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Mercury	0.150	U	0.100	0.150	0.200

Laboratory Control Sample (LCS)

(LCS) R3693315-2 08/18/21 09:20

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	3.00	3.44	115	82.0-119	

L1390483-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390483-01 08/18/21 09:23 • (MS) R3693315-3 08/18/21 09:25 • (MSD) R3693315-4 08/18/21 09:28

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00	0.150	3.38	3.31	113	110	1	82.0-119			2.20	20

Method Blank (MB)

(MB) R3694568-1 08/20/21 09:05

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Antimony	5.00	U	4.30	5.00	10.0
Arsenic	5.00	U	4.40	5.00	10.0
Barium	2.50	U	0.736	2.50	5.00
Beryllium	1.00	U	0.330	1.00	2.00
Cadmium	1.00	U	0.479	1.00	2.00
Calcium	500	U	79.3	500	1000
Chromium	5.00	U	1.40	5.00	10.0
Cobalt	5.00	U	0.840	5.00	10.0
Copper	5.00	U	3.68	5.00	10.0
Lead	2.50	U	2.99	2.50	6.00
Molybdenum	2.50	U	1.16	2.50	5.00
Nickel	5.00	U	1.61	5.00	10.0
Selenium	8.00	U	7.35	8.00	10.0
Silver	2.50	U	1.54	2.50	5.00
Thallium	5.00	U	4.31	5.00	10.0
Vanadium	10.0	U	4.99	10.0	20.0
Zinc	25.0	U	6.52	25.0	50.0

Laboratory Control Sample (LCS)

(LCS) R3694568-2 08/20/21 09:08

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	1000	938	93.8	88.0-113	
Arsenic	1000	915	91.5	87.0-113	
Barium	1000	964	96.4	88.0-113	
Beryllium	1000	941	94.1	89.0-112	
Cadmium	1000	946	94.6	88.0-113	
Calcium	10000	9320	93.2	87.0-113	
Chromium	1000	936	93.6	90.0-113	
Cobalt	1000	956	95.6	89.0-114	
Copper	1000	963	96.3	86.0-114	
Lead	1000	943	94.3	86.0-113	
Molybdenum	1000	981	98.1	89.0-113	
Nickel	1000	945	94.5	88.0-113	
Selenium	1000	951	95.1	83.0-114	
Silver	200	170	85.0	84.0-115	
Thallium	1000	925	92.5	85.0-114	
Vanadium	1000	956	95.6	90.0-111	

Laboratory Control Sample (LCS)

(LCS) R3694568-2 08/20/21 09:08

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Zinc	1000	934	93.4	87.0-115	

L1390483-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390483-01 08/20/21 09:11 • (MS) R3694568-4 08/20/21 09:16 • (MSD) R3694568-5 08/20/21 09:19

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	1000	5.00	957	973	95.7	97.3	1	88.0-113			1.60	20
Arsenic	1000	5.00	945	958	94.5	95.8	1	87.0-113			1.35	20
Barium	1000	116	1090	1110	97.0	99.0	1	88.0-113			1.78	20
Beryllium	1000	1.00	968	981	96.8	98.1	1	89.0-112			1.39	20
Cadmium	1000	0.613	959	978	95.9	97.7	1	88.0-113			1.91	20
Calcium	10000	25300	34600	34700	92.7	93.7	1	87.0-113			0.278	20
Chromium	1000	2.10	943	952	94.1	95.0	1	90.0-113			0.952	20
Cobalt	1000	2.85	977	994	97.4	99.1	1	89.0-114			1.73	20
Copper	1000	3.93	978	997	97.4	99.3	1	86.0-114			1.96	20
Lead	1000	2.50	957	966	95.7	96.6	1	86.0-113			1.00	20
Molybdenum	1000	2.50	991	1010	99.1	101	1	89.0-113			1.72	20
Nickel	1000	6.18	964	981	95.8	97.5	1	88.0-113			1.73	20
Selenium	1000	8.00	979	988	97.9	98.8	1	83.0-114			0.931	20
Silver	200	2.50	172	175	86.2	87.6	1	84.0-115			1.54	20
Thallium	1000	5.00	947	968	94.7	96.8	1	85.0-114			2.12	20
Vanadium	1000	10.0	983	999	98.3	99.9	1	90.0-111			1.67	20
Zinc	1000	28.0	964	977	93.6	94.9	1	87.0-115			1.35	20

Method Blank (MB)

(MB) R3694208-3 08/14/21 14:36

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
TPHG C5 - C12	51.4	J	30.4	50.0	100
(S) a,a,a-Trifluorotoluene(FID)	*106*				*62.0-128*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3694208-1 08/14/21 12:47 • (LCSD) R3694208-2 08/14/21 13:10

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPHG C5 - C12	5500	6150	6440	112	117	78.0-122			4.61	30
(S) a,a,a-Trifluorotoluene(FID)				*99.4*	*99.6*	*62.0-128*				

L1390545-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390545-11 08/14/21 17:57 • (MS) R3694208-4 08/14/21 23:21 • (MSD) R3694208-5 08/14/21 23:45

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPHG C5 - C12	5500	90.3	4600	4850	82.0	86.5	1	78.0-122			5.29	30
(S) a,a,a-Trifluorotoluene(FID)					*109*	*103*		*62.0-128*				

Method Blank (MB)

(MB) R3694904-2 08/20/21 08:59

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
TPHG C5 - C12	50.0	U	30.4	50.0	100
(S) a,a,a-Trifluorotoluene(FID)	*95.0*				*62.0-128*

Laboratory Control Sample (LCS)

(LCS) R3694904-1 08/20/21 08:06

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPHG C5 - C12	5500	6100	111	78.0-122	
(S) a,a,a-Trifluorotoluene(FID)			*106*	*62.0-128*	

Method Blank (MB)

(MB) R3695673-3 08/20/21 03:28

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Benzene	0.500	U	0.0941	0.500	1.00
Bromochloromethane	0.500	U	0.128	0.500	1.00
Bromodichloromethane	0.500	U	0.136	0.500	1.00
Bromoform	0.500	U	0.129	0.500	1.00
Bromomethane	2.00	U	0.605	2.00	5.00
Carbon disulfide	0.500	U	0.0962	0.500	1.00
Chlorobenzene	0.500	U	0.116	0.500	1.00
Chloroform	2.00	U	0.111	2.00	5.00
Chloromethane	1.00	U	0.960	1.00	2.50
Cyclohexane	1.00	U	0.188	1.00	1.00
1,2-Dibromo-3-Chloropropane	2.00	U	0.276	2.00	5.00
1,2-Dibromoethane	0.500	U	0.126	0.500	1.00
1,2-Dichlorobenzene	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	0.500	U	0.149	0.500	1.00
cis-1,3-Dichloropropene	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	0.500	U	0.118	0.500	1.00
Ethylbenzene	0.500	U	0.137	0.500	1.00
2-Hexanone	5.00	U	0.787	5.00	10.0
Isopropylbenzene	0.500	U	0.105	0.500	1.00
2-Butanone (MEK)	5.00	U	1.19	5.00	10.0
Methyl Cyclohexane	0.660	U	0.660	0.660	1.00
Methylene Chloride	2.00	U	0.430	2.00	5.00
4-Methyl-2-pentanone (MIBK)	5.00	U	0.478	5.00	10.0
Methyl tert-butyl ether	0.500	U	0.101	0.500	1.00
Styrene	0.500	U	0.118	0.500	1.00
1,1,2,2-Tetrachloroethane	0.500	U	0.133	0.500	1.00
Tetrachloroethene	0.500	U	0.300	0.500	1.00
Toluene	0.500	U	0.278	0.500	1.00
1,2,3-Trichlorobenzene	0.500	U	0.230	0.500	1.00
1,2,4-Trichlorobenzene	0.500	U	0.481	0.500	1.00
1,1,1-Trichloroethane	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	0.500	U	0.158	0.500	1.00

Method Blank (MB)

(MB) R3695673-3 08/20/21 03:28

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Trichloroethene	0.500	U	0.190	0.500	1.00
Trichlorofluoromethane	2.00	U	0.160	2.00	5.00
Vinyl chloride	0.500	U	0.234	0.500	1.00
Xylenes, Total	1.50	U	0.174	1.50	3.00
(S) Toluene-d8	*106*				*89.0-112*
(S) 4-Bromofluorobenzene	*102*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*104*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3695673-1 08/20/21 02:31 • (LCSD) R3695673-2 08/20/21 02:50

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	5.00	4.78	4.68	95.6	93.6	79.0-120			2.11	20
Bromochloromethane	5.00	5.28	5.09	106	102	78.0-123			3.66	20
Bromodichloromethane	5.00	4.78	4.78	95.6	95.6	79.0-125			0.000	20
Bromoform	5.00	4.77	4.60	95.4	92.0	66.0-130			3.63	20
Bromomethane	5.00	4.72	4.87	94.4	97.4	53.0-141			3.13	20
Carbon disulfide	5.00	4.87	5.14	97.4	103	64.0-133			5.39	20
Chlorobenzene	5.00	5.08	5.06	102	101	82.0-118			0.394	20
Chloroform	5.00	4.81	4.80	96.2	96.0	79.0-124			0.208	20
Chloromethane	5.00	4.49	4.63	89.8	92.6	50.0-139			3.07	20
Cyclohexane	5.00	4.43	4.61	88.6	92.2	71.0-130			3.98	20
1,2-Dibromo-3-Chloropropane	5.00	5.22	4.98	104	99.6	62.0-128			4.71	20
1,2-Dibromoethane	5.00	5.07	5.00	101	100	77.0-121			1.39	20
1,2-Dichlorobenzene	5.00	5.35	5.20	107	104	80.0-119			2.84	20
1,3-Dichlorobenzene	5.00	5.20	5.23	104	105	80.0-119			0.575	20
1,4-Dichlorobenzene	5.00	5.20	5.12	104	102	79.0-118			1.55	20
Dichlorodifluoromethane	5.00	5.70	5.75	114	115	32.0-152			0.873	20
1,1-Dichloroethane	5.00	4.87	4.72	97.4	94.4	77.0-125			3.13	20
1,2-Dichloroethane	5.00	5.09	4.90	102	98.0	73.0-128			3.80	20
1,1-Dichloroethene	5.00	4.91	5.01	98.2	100	71.0-131			2.02	20
cis-1,2-Dichloroethene	5.00	4.79	4.78	95.8	95.6	78.0-123			0.209	20
trans-1,2-Dichloroethene	5.00	4.75	4.91	95.0	98.2	75.0-124			3.31	20
1,2-Dichloropropane	5.00	4.78	4.82	95.6	96.4	78.0-122			0.833	20
cis-1,3-Dichloropropene	5.00	4.79	4.93	95.8	98.6	75.0-124			2.88	20
trans-1,3-Dichloropropene	5.00	4.78	4.80	95.6	96.0	73.0-127			0.418	20
Ethylbenzene	5.00	5.06	4.98	101	99.6	79.0-121			1.59	20
2-Hexanone	25.0	25.9	25.0	104	100	57.0-139			3.54	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3695673-1 08/20/21 02:31 • (LCSD) R3695673-2 08/20/21 02:50

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Isopropylbenzene	5.00	5.30	5.14	106	103	72.0-131			3.07	20
2-Butanone (MEK)	25.0	24.4	21.6	97.6	86.4	56.0-143			12.2	20
Methylene Chloride	5.00	4.72	4.79	94.4	95.8	74.0-124			1.47	20
Methyl Cyclohexane	5.00	4.97	5.47	99.4	109	72.0-132			9.58	20
4-Methyl-2-pentanone (MIBK)	25.0	26.2	25.2	105	101	67.0-130			3.89	20
Methyl tert-butyl ether	5.00	5.00	4.90	100	98.0	71.0-124			2.02	20
Styrene	5.00	4.93	4.88	98.6	97.6	78.0-123			1.02	20
1,1,2,2-Tetrachloroethane	5.00	4.56	4.61	91.2	92.2	71.0-121			1.09	20
Tetrachloroethene	5.00	5.17	5.23	103	105	74.0-129			1.15	20
Toluene	5.00	5.02	5.03	100	101	80.0-121			0.199	20
1,2,3-Trichlorobenzene	5.00	5.18	5.32	104	106	69.0-129			2.67	20
1,2,4-Trichlorobenzene	5.00	5.39	5.10	108	102	69.0-130			5.53	20
1,1,1-Trichloroethane	5.00	4.79	5.06	95.8	101	74.0-131			5.48	20
1,1,2-Trichloroethane	5.00	4.94	5.03	98.8	101	80.0-119			1.81	20
Trichloroethene	5.00	5.22	5.20	104	104	79.0-123			0.384	20
Trichlorofluoromethane	5.00	5.32	5.47	106	109	65.0-141			2.78	20
Vinyl chloride	5.00	4.61	4.59	92.2	91.8	58.0-137			0.435	20
Xylenes, Total	15.0	15.4	15.1	103	101	79.0-121			1.97	20
(S) Toluene-d8				*105*	*106*	*89.0-112*				
(S) 4-Bromofluorobenzene				*103*	*100*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*106*	*104*	*81.0-118*				

Method Blank (MB)

(MB) R3696428-3 08/24/21 12:50

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Carbon tetrachloride	0.500	U	0.128	0.500	1.00
2-Hexanone	5.00	U	0.787	5.00	10.0
Methyl Acetate	5.00	U	1.29	5.00	20.0
1,1,2-Trichlorotrifluoroethane	0.500	U	0.180	0.500	1.00
(S) Toluene-d8	*105*				*89.0-112*
(S) 4-Bromofluorobenzene	*99.2*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*103*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3696428-1 08/24/21 11:09 • (LCSD) R3696428-2 08/24/21 11:29

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Carbon tetrachloride	5.00	5.27	5.37	105	107	72.0-136			1.88	20
2-Hexanone	25.0	22.0	20.6	88.0	82.4	57.0-139			6.57	20
1,1,2-Trichlorotrifluoroethane	5.00	4.99	5.36	99.8	107	70.0-136			7.15	20
Methyl Acetate	25.0	23.5	22.3	94.0	89.2	56.0-136			5.24	20
(S) Toluene-d8				*98.7*	*98.8*	*89.0-112*				
(S) 4-Bromofluorobenzene				*97.6*	*91.3*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*101*	*107*	*81.0-118*				

L1390488-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390488-01 08/24/21 16:31 • (MS) R3696428-4 08/24/21 20:55 • (MSD) R3696428-5 08/24/21 21:16

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Carbon tetrachloride	5.00	0.500	4.65	3.21	93.0	64.2	1	72.0-136		J3 J6	36.6	20
2-Hexanone	25.0	5.00	22.9	22.4	91.6	89.6	1	57.0-139			2.21	20
1,1,2-Trichlorotrifluoroethane	5.00	0.500	4.46	2.75	89.2	55.0	1	70.0-136		J3 J6	47.4	20
Methyl Acetate	25.0	5.00	24.2	23.9	96.8	95.6	1	18.0-151			1.25	20
(S) Toluene-d8					*96.8*	*102*		*89.0-112*				
(S) 4-Bromofluorobenzene					*94.9*	*95.4*		*85.0-114*				
(S) 1,2-Dichloroethane-d4					*103*	*102*		*81.0-118*				

Method Blank (MB)

(MB) R3696918-4 08/25/21 21:23

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Acetone	25.0	U	11.3	25.0	50.0
(S) Toluene-d8	*104*				*89.0-112*
(S) 4-Bromofluorobenzene	*92.8*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*97.6*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3696918-1 08/25/21 20:02 • (LCSD) R3696918-2 08/25/21 20:22

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	25.7	24.8	103	99.2	39.0-160			3.56	20
(S) Toluene-d8				*104*	*105*	*89.0-112*				
(S) 4-Bromofluorobenzene				*96.9*	*96.3*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*94.3*	*93.9*	*81.0-118*				

Method Blank (MB)

(MB) R3696810-3 08/25/21 21:32

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Acetone	25.0	U	11.3	25.0	50.0
(S) Toluene-d8	*92.9*				*89.0-112*
(S) 4-Bromofluorobenzene	*96.6*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*107*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3696810-1 08/25/21 20:29 • (LCSD) R3696810-2 08/25/21 20:50

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	27.5	24.0	110	96.0	39.0-160			13.6	20
(S) Toluene-d8				*91.3*	*92.1*	*89.0-112*				
(S) 4-Bromofluorobenzene				*93.4*	*94.7*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*108*	*105*	*81.0-118*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3693289-1 08/17/21 22:35

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
C12-C22 Hydrocarbons	50.0	U	33.0	50.0	100
C22-C32 Hydrocarbons	50.0	U	33.0	50.0	100
C32-C40 Hydrocarbons	50.0	U	33.0	50.0	100
(S) o-Terphenyl	*56.0*				*52.0-156*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3693289-2 08/17/21 23:01 • (LCSD) R3693289-3 08/17/21 23:27

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
C22-C32 Hydrocarbons	750	712	690	94.9	92.0	50.0-150			3.14	20
C12-C22 Hydrocarbons	750	792	765	106	102	50.0-150			3.47	20
(S) o-Terphenyl				*70.5*	*63.0*	*52.0-156*				

Method Blank (MB)

(MB) R3692805-1 08/16/21 23:08

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
2,4-D	1.00	U	0.547	1.00	2.00
Dalapon	1.00	U	0.344	1.00	2.00
2,4-DB	1.00	U	0.302	1.00	2.00
Dicamba	1.00	U	0.245	1.00	2.00
Dichloroprop	1.04	U	1.04	1.04	2.00
Dinoseb	1.00	U	0.250	1.00	2.00
MCPA	50.0	U	13.1	50.0	100
MCPP	66.0	U	66.0	66.0	100
2,4,5-T	1.00	U	0.258	1.00	2.00
2,4,5-TP (Silvex)	1.00	U	0.335	1.00	2.00
(S) 2,4-Dichlorophenyl Acetic Acid	*80.8*				*32.0-138*

Laboratory Control Sample (LCS)

(LCS) R3692805-2 08/16/21 23:23

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
2,4,5-T	5.00	4.31	86.2	42.0-147	
2,4,5-TP (Silvex)	5.00	3.75	75.0	51.0-134	
2,4-D	5.00	4.34	86.8	45.0-152	
2,4-DB	5.00	4.66	93.2	35.0-153	
Dalapon	5.00	3.81	76.2	19.0-139	
Dicamba	5.00	4.18	83.6	50.0-141	
Dichloroprop	5.00	4.37	87.4	46.0-159	
Dinoseb	5.00	3.79	75.8	42.5-112	
MCPA	50.0	141	282	35.0-144	E J4 P
MCPP	50.0	29.7	59.4	33.0-157	
(S) 2,4-Dichlorophenyl Acetic Acid			*100*	*32.0-138*	

L1390483-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390483-01 08/17/21 03:45 • (MS) R3692805-3 08/17/21 03:59 • (MSD) R3692805-4 08/17/21 04:14

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
2,4,5-T	5.00	1.00	4.49	4.79	89.8	95.8	1	42.0-147			6.47	30
2,4,5-TP (Silvex)	5.00	1.00	4.08	4.33	81.6	86.6	1	51.0-134			5.95	30
2,4-D	5.00	1.00	4.77	4.93	95.4	98.6	1	45.0-152			3.30	30
2,4-DB	5.00	1.00	4.69	5.02	93.8	100	1	35.0-153		P	6.80	30

L1390483-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390483-01 08/17/21 03:45 • (MS) R3692805-3 08/17/21 03:59 • (MSD) R3692805-4 08/17/21 04:14

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Dalapon	5.00	1.00	3.91	3.85	78.2	77.0	1	19.0-139			1.55	30
Dicamba	5.00	1.00	4.51	4.60	90.2	92.0	1	50.0-141			1.98	30
Dichloroprop	5.00	1.04	4.52	4.68	90.4	93.6	1	46.0-159			3.48	30
Dinoseb	5.00	1.00	3.91	4.20	78.2	84.0	1	42.5-112		P	7.15	30
MCPA	50.0	50.0	127	141	254	282	1	35.0-144	E J5 P	E J5 P	10.4	30
MCPP	50.0	66.0	66.0	66.0	81.0	77.4	1	33.0-157	U	U	4.55	30
(S) 2,4-Dichlorophenyl Acetic Acid					*101*	*108*		*32.0-138*				

Method Blank (MB)

(MB) R3694082-1 08/18/21 12:21

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Aldrin	0.0250	U	0.0198	0.0250	0.0500
Alpha BHC	0.0250	U	0.0172	0.0250	0.0500
Beta BHC	0.0250	U	0.0208	0.0250	0.0500
Delta BHC	0.0250	U	0.0150	0.0250	0.0500
Gamma BHC	0.0250	U	0.0209	0.0250	0.0500
4,4-DDD	0.0250	U	0.0177	0.0250	0.0500
4,4-DDE	0.0250	U	0.0154	0.0250	0.0500
4,4-DDT	0.0250	U	0.0198	0.0250	0.0500
Dieldrin	0.0250	U	0.0162	0.0250	0.0500
Endosulfan I	0.0250	U	0.0160	0.0250	0.0500
Endosulfan II	0.0250	U	0.0164	0.0250	0.0500
Endosulfan sulfate	0.0250	U	0.0217	0.0250	0.0500
Endrin	0.0250	U	0.0161	0.0250	0.0500
Endrin aldehyde	0.0250	U	0.0237	0.0250	0.0500
Endrin ketone	0.0250	U	0.0219	0.0250	0.0500
Heptachlor	0.0250	U	0.0148	0.0250	0.0500
Heptachlor epoxide	0.0250	U	0.0183	0.0250	0.0500
Hexachlorobenzene	0.0250	U	0.0176	0.0250	0.0500
Methoxychlor	0.0250	U	0.0193	0.0250	0.0500
Chlordane	0.250	U	0.0198	0.250	5.00
Toxaphene	0.250	U	0.168	0.250	0.500
(S) Decachlorobiphenyl	*157*	J1			*10.0-156*
(S) Tetrachloro-m-xylene	*100*				*44.0-124*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3694082-2 08/18/21 12:28 • (LCSD) R3694082-3 08/18/21 12:35

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aldrin	1.00	0.997	1.01	99.7	101	45.0-134			1.30	30
Alpha BHC	1.00	0.922	0.925	92.2	92.5	54.0-138			0.325	30
Beta BHC	1.00	1.17	1.12	117	112	56.0-136			4.37	30
Delta BHC	1.00	1.05	1.01	105	101	52.0-142			3.88	30
Gamma BHC	1.00	0.970	0.976	97.0	97.6	59.0-134			0.617	30
4,4-DDD	1.00	1.23	1.20	123	120	56.0-143			2.47	30
4,4-DDE	1.00	1.30	1.29	130	129	57.0-135			0.772	30
4,4-DDT	1.00	1.31	1.30	131	130	51.0-143			0.766	30
Dieldrin	1.00	1.20	1.17	120	117	60.0-136			2.53	30
Endosulfan I	1.00	1.12	1.15	112	115	62.0-126			2.64	30

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3694082-2 08/18/21 12:28 • (LCSD) R3694082-3 08/18/21 12:35

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Endosulfan II	1.00	1.30	1.26	130	126	52.0-135			3.12	30
Endosulfan sulfate	1.00	1.28	1.25	128	125	62.0-133			2.37	30
Endrin	1.00	1.20	1.18	120	118	60.0-138			1.68	30
Endrin aldehyde	1.00	1.17	1.15	117	115	51.0-132			1.72	30
Endrin ketone	1.00	1.37	1.33	137	133	58.0-134	J4		2.96	30
Heptachlor	1.00	0.940	1.04	94.0	104	54.0-130			10.1	30
Heptachlor epoxide	1.00	1.14	1.12	114	112	61.0-133			1.77	30
Hexachlorobenzene	1.00	1.03	1.09	103	109	27.8-136			5.66	30
Methoxychlor	1.00	1.61	1.59	161	159	54.0-145	J4 P	J4 P	1.25	30
(S) Decachlorobiphenyl				*169*	*146*	*10.0-156*	J1			
(S) Tetrachloro-m-xylene				*106*	*107*	*44.0-124*				

Method Blank (MB)

(MB) R3694174-1 08/18/21 13:03

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Aldrin	0.0250	U	0.0198	0.0250	0.0500
Alpha BHC	0.0250	U	0.0172	0.0250	0.0500
Beta BHC	0.0250	U	0.0208	0.0250	0.0500
Delta BHC	0.0250	U	0.0150	0.0250	0.0500
Gamma BHC	0.0250	U	0.0209	0.0250	0.0500
4,4-DDD	0.0250	U	0.0177	0.0250	0.0500
4,4-DDE	0.0250	U	0.0154	0.0250	0.0500
4,4-DDT	0.0250	U	0.0198	0.0250	0.0500
Dieldrin	0.0250	U	0.0162	0.0250	0.0500
Endosulfan I	0.0250	U	0.0160	0.0250	0.0500
Endosulfan II	0.0250	U	0.0164	0.0250	0.0500
Endosulfan sulfate	0.0250	U	0.0217	0.0250	0.0500
Endrin	0.0250	U	0.0161	0.0250	0.0500
Endrin aldehyde	0.0250	U	0.0237	0.0250	0.0500
Endrin ketone	0.0250	U	0.0219	0.0250	0.0500
Heptachlor	0.0250	U	0.0148	0.0250	0.0500
Heptachlor epoxide	0.0250	U	0.0183	0.0250	0.0500
Hexachlorobenzene	0.0250	U	0.0176	0.0250	0.0500
Methoxychlor	0.0250	U	0.0193	0.0250	0.0500
Chlordane	0.250	U	0.0198	0.250	5.00
Toxaphene	0.250	U	0.168	0.250	0.500
(S) Decachlorobiphenyl	*68.1*				*10.0-156*
(S) Tetrachloro-m-xylene	*79.0*				*44.0-124*

Laboratory Control Sample (LCS)

(LCS) R3694174-2 08/18/21 13:11

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aldrin	1.00	0.713	71.3	45.0-134	
Alpha BHC	1.00	0.764	76.4	54.0-138	
Beta BHC	1.00	0.897	89.7	56.0-136	
Delta BHC	1.00	0.831	83.1	52.0-142	
Gamma BHC	1.00	0.796	79.6	59.0-134	
4,4-DDD	1.00	0.797	79.7	56.0-143	
4,4-DDE	1.00	0.755	75.5	57.0-135	
4,4-DDT	1.00	0.822	82.2	51.0-143	
Dieldrin	1.00	0.791	79.1	60.0-136	
Endosulfan I	1.00	0.792	79.2	62.0-126	

Laboratory Control Sample (LCS)

(LCS) R3694174-2 08/18/21 13:11

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Endosulfan II	1.00	0.812	81.2	52.0-135	
Endosulfan sulfate	1.00	0.792	79.2	62.0-133	
Endrin	1.00	0.784	78.4	60.0-138	
Endrin aldehyde	1.00	0.738	73.8	51.0-132	
Endrin ketone	1.00	0.814	81.4	58.0-134	
Heptachlor	1.00	0.771	77.1	54.0-130	
Heptachlor epoxide	1.00	0.773	77.3	61.0-133	
Hexachlorobenzene	1.00	0.685	68.5	27.8-136	
Methoxychlor	1.00	0.787	78.7	54.0-145	P
(S) Decachlorobiphenyl			*74.7*	*10.0-156*	
(S) Tetrachloro-m-xylene			*72.3*	*44.0-124*	

L1390483-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390483-01 08/18/21 13:29 • (MS) R3694174-4 08/18/21 13:38 • (MSD) R3694174-5 08/18/21 13:47

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aldrin	1.00	0.0250	0.480	0.598	48.0	59.8	1	45.0-134			21.9	30
Alpha BHC	1.00	0.0250	0.598	0.761	59.8	76.1	1	54.0-138			24.0	30
Beta BHC	1.00	0.0250	0.701	0.874	70.1	87.4	1	56.0-136			22.0	30
Delta BHC	1.00	0.0250	0.638	0.800	63.8	80.0	1	52.0-142			22.5	30
Gamma BHC	1.00	0.0250	0.612	0.764	61.2	76.4	1	59.0-134			22.1	30
4,4-DDD	1.00	0.0250	0.616	0.604	61.6	60.4	1	56.0-143	P	P	1.97	30
4,4-DDE	1.00	0.0250	0.577	0.674	57.7	67.4	1	57.0-135			15.5	30
4,4-DDT	1.00	0.0250	0.606	0.713	60.6	71.3	1	51.0-143			16.2	30
Dieldrin	1.00	0.0250	0.613	0.731	61.3	73.1	1	60.0-136			17.6	30
Endosulfan I	1.00	0.0250	0.623	0.744	62.3	74.4	1	62.0-126			17.7	30
Endosulfan II	1.00	0.0250	0.622	0.747	62.2	74.7	1	52.0-135			18.3	30
Endosulfan sulfate	1.00	0.0250	0.621	0.748	62.1	74.8	1	62.0-133			18.6	30
Endrin	1.00	0.0250	0.606	0.735	60.6	73.5	1	60.0-138			19.2	30
Endrin aldehyde	1.00	0.0250	0.578	0.702	57.8	70.2	1	51.0-132			19.4	30
Endrin ketone	1.00	0.0250	0.636	0.772	63.6	77.2	1	58.0-134			19.3	30
Heptachlor	1.00	0.0250	0.526	0.627	52.6	62.7	1	54.0-130	J6		17.5	30
Heptachlor epoxide	1.00	0.0250	0.607	0.722	60.7	72.2	1	61.0-133	J6		17.3	30
Hexachlorobenzene	1.00	0.0250	0.469	0.617	46.9	61.7	1	27.8-136			27.3	30
Methoxychlor	1.00	0.0250	0.607	0.717	60.7	71.7	1	54.0-145	P	P	16.6	30
(S) Decachlorobiphenyl					*58.6*	*75.0*		*10.0-156*				
(S) Tetrachloro-m-xylene					*52.4*	*67.9*		*44.0-124*				

Method Blank (MB)

(MB) R3695087-1 08/23/21 02:10

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Aldrin	0.0250	U	0.0198	0.0250	0.0500
Alpha BHC	0.0250	U	0.0172	0.0250	0.0500
Beta BHC	0.0250	U	0.0208	0.0250	0.0500
Delta BHC	0.0250	U	0.0150	0.0250	0.0500
Gamma BHC	0.0250	U	0.0209	0.0250	0.0500
4,4-DDD	0.0250	U	0.0177	0.0250	0.0500
4,4-DDE	0.0250	U	0.0154	0.0250	0.0500
4,4-DDT	0.0250	U	0.0198	0.0250	0.0500
Dieldrin	0.0250	U	0.0162	0.0250	0.0500
Endosulfan I	0.0250	U	0.0160	0.0250	0.0500
Endosulfan II	0.0250	U	0.0164	0.0250	0.0500
Endosulfan sulfate	0.0250	U	0.0217	0.0250	0.0500
Endrin	0.0250	U	0.0161	0.0250	0.0500
Endrin aldehyde	0.0250	U	0.0237	0.0250	0.0500
Endrin ketone	0.0250	U	0.0219	0.0250	0.0500
Heptachlor	0.0250	U	0.0148	0.0250	0.0500
Heptachlor epoxide	0.0250	U	0.0183	0.0250	0.0500
Hexachlorobenzene	0.0250	U	0.0176	0.0250	0.0500
Methoxychlor	0.0250	U	0.0193	0.0250	0.0500
Chlordane	0.250	U	0.0198	0.250	5.00
Toxaphene	0.250	U	0.168	0.250	0.500
(S) Decachlorobiphenyl	*25.3*				*10.0-156*
(S) Tetrachloro-m-xylene	*60.3*				*44.0-124*

Laboratory Control Sample (LCS)

(LCS) R3695087-3 08/23/21 02:19

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aldrin	1.00	0.751	75.1	45.0-134	
Alpha BHC	1.00	0.841	84.1	54.0-138	
Beta BHC	1.00	0.984	98.4	56.0-136	
Delta BHC	1.00	0.902	90.2	52.0-142	
Gamma BHC	1.00	0.887	88.7	59.0-134	
4,4-DDD	1.00	1.13	113	56.0-143	
4,4-DDE	1.00	0.852	85.2	57.0-135	
4,4-DDT	1.00	1.01	101	51.0-143	
Dieldrin	1.00	0.865	86.5	60.0-136	
Endosulfan I	1.00	0.661	66.1	62.0-126	

Laboratory Control Sample (LCS)

(LCS) R3695087-3 08/23/21 02:19

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Endosulfan II	1.00	0.542	54.2	52.0-135	
Endosulfan sulfate	1.00	0.898	89.8	62.0-133	
Endrin	1.00	0.903	90.3	60.0-138	
Endrin aldehyde	1.00	0.792	79.2	51.0-132	
Endrin ketone	1.00	0.949	94.9	58.0-134	
Heptachlor	1.00	0.823	82.3	54.0-130	
Heptachlor epoxide	1.00	0.826	82.6	61.0-133	
Hexachlorobenzene	1.00	0.645	64.5	27.8-136	
Methoxychlor	1.00	1.34	134	54.0-145	P
(S) Decachlorobiphenyl			*55.3*	*10.0-156*	
(S) Tetrachloro-m-xylene			*57.9*	*44.0-124*	

Method Blank (MB)

(MB) R3693984-1 08/18/21 15:31

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
PCB 1260	0.250	U	0.173	0.250	0.500
PCB 1016	0.270	U	0.270	0.270	0.500
PCB 1221	0.270	U	0.270	0.270	0.500
PCB 1232	0.270	U	0.270	0.270	0.500
PCB 1242	1.80		0.270	0.270	0.500
PCB 1248	0.250	U	0.173	0.250	0.500
PCB 1254	0.250	U	0.173	0.250	0.500
PCB 1262	0.250	U	0.173	0.250	0.500
PCB 1268	0.250	U	0.173	0.250	0.500
(S) Decachlorobiphenyl	*94.9*				*10.0-156*
(S) Tetrachloro-m-xylene	*83.5*				*44.0-124*

Laboratory Control Sample (LCS)

(LCS) R3693984-2 08/18/21 15:40

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1260	2.50	2.58	103	45.0-134	
PCB 1016	2.50	2.69	108	46.0-129	
(S) Decachlorobiphenyl			*89.0*	*10.0-156*	
(S) Tetrachloro-m-xylene			*91.2*	*44.0-124*	

L1390235-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390235-01 08/18/21 21:54 • (MS) R3693984-3 08/18/21 22:03 • (MSD) R3693984-4 08/18/21 22:12

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1260	2.50	0.250	3.02	2.68	121	107	1	45.0-134			11.9	30
PCB 1016	2.50	0.270	3.34	3.19	134	128	1	46.0-129	J5		4.59	30
(S) Decachlorobiphenyl					*73.1*	*94.3*		*10.0-156*				
(S) Tetrachloro-m-xylene					*85.4*	*93.8*		*44.0-124*				

Method Blank (MB)

(MB) R3694941-1 08/21/21 13:53

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
PCB 1260	0.250	U	0.173	0.250	0.500
PCB 1016	0.270	U	0.270	0.270	0.500
PCB 1221	0.270	U	0.270	0.270	0.500
PCB 1232	0.270	U	0.270	0.270	0.500
PCB 1242	0.270	U	0.270	0.270	0.500
PCB 1248	0.250	U	0.173	0.250	0.500
PCB 1254	0.250	U	0.173	0.250	0.500
PCB 1262	0.250	U	0.173	0.250	0.500
PCB 1268	0.250	U	0.173	0.250	0.500
(S) Decachlorobiphenyl	*26.2*				*10.0-156*
(S) Tetrachloro-m-xylene	*87.0*				*44.0-124*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3694941-5 08/21/21 14:37 • (LCSD) R3694941-2 08/21/21 14:45

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
PCB 1260	2.50	2.40	1.84	96.0	73.6	45.0-134			26.4	30
PCB 1016	2.50	3.20	2.43	128	97.2	46.0-129	P		27.4	30
(S) Decachlorobiphenyl				*50.8*	*67.6*	*10.0-156*				
(S) Tetrachloro-m-xylene				*82.6*	*84.6*	*44.0-124*				

Method Blank (MB)

(MB) R3698063-1 08/29/21 17:30

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
PCB 1260	0.250	U	0.173	0.250	0.500
PCB 1016	0.270	U	0.270	0.270	0.500
PCB 1221	0.270	U	0.270	0.270	0.500
PCB 1232	0.270	U	0.270	0.270	0.500
PCB 1242	0.270	U	0.270	0.270	0.500
PCB 1248	0.250	U	0.173	0.250	0.500
PCB 1254	0.250	U	0.173	0.250	0.500
PCB 1262	0.250	U	0.173	0.250	0.500
PCB 1268	0.250	U	0.173	0.250	0.500
(S) Decachlorobiphenyl	*19.4*				*10.0-156*
(S) Tetrachloro-m-xylene	*84.6*				*44.0-124*

Laboratory Control Sample (LCS)

(LCS) R3698063-2 08/29/21 17:55

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1260	2.50	1.69	67.6	45.0-134	
PCB 1016	2.50	2.41	96.4	46.0-129	P
(S) Decachlorobiphenyl			*29.4*	*10.0-156*	
(S) Tetrachloro-m-xylene			*68.8*	*44.0-124*	

Method Blank (MB)

(MB) R3693650-2 08/18/21 11:34

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Anthracene	0.0250	U	0.0190	0.0250	0.0500
Acenaphthene	0.0250	U	0.0190	0.0250	0.0500
Acenaphthylene	0.0250	U	0.0170	0.0250	0.0500
Benzo(a)anthracene	0.0528		0.0200	0.0250	0.0500
Benzo(a)pyrene	0.0566		0.0180	0.0250	0.0500
Benzo(b)fluoranthene	0.0816		0.0170	0.0250	0.0500
Benzo(g,h,i)perylene	0.110		0.0180	0.0250	0.0500
Benzo(k)fluoranthene	0.0833	J	0.0200	0.125	0.250
Chrysene	0.0624		0.0180	0.0250	0.0500
Dibenz(a,h)anthracene	0.0993		0.0180	0.0250	0.0500
Fluoranthene	0.0250	U	0.0110	0.0250	0.0500
Fluorene	0.0250	U	0.0170	0.0250	0.0500
Indeno(1,2,3-cd)pyrene	0.0913		0.0180	0.0250	0.0500
Naphthalene	0.250	U	0.128	0.250	0.500
Phenanthrene	0.0239	J	0.0180	0.0250	0.0500
Pyrene	0.0316	J	0.0170	0.0250	0.0500
2-Methylnaphthalene	0.250	U	0.0280	0.250	0.500
2-Chloronaphthalene	0.250	U	0.0120	0.250	0.500
(S) Nitrobenzene-d5	*89.0*				*55.0-111*
(S) 2-Fluorobiphenyl	*95.0*				*53.0-106*
(S) p-Terphenyl-d14	*128*				*58.0-132*
(S) 2-Methylnaphthalene-D10	*87.5*				*50.0-150*
(S) Fluoranthene-D10	*98.5*				*50.0-150*

Laboratory Control Sample (LCS)

(LCS) R3693650-1 08/18/21 11:17

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	2.00	1.87	93.5	53.0-119	
Acenaphthene	2.00	1.85	92.5	48.0-114	
Acenaphthylene	2.00	1.94	97.0	35.0-121	
Benzo(a)anthracene	2.00	1.94	97.0	59.0-120	
Benzo(a)pyrene	2.00	1.88	94.0	53.0-120	
Benzo(b)fluoranthene	2.00	1.91	95.5	53.0-126	
Benzo(g,h,i)perylene	2.00	1.85	92.5	44.0-128	
Benzo(k)fluoranthene	2.00	1.85	92.5	54.0-125	
Chrysene	2.00	2.02	101	57.0-120	
Dibenz(a,h)anthracene	2.00	1.71	85.5	44.0-131	

Laboratory Control Sample (LCS)

(LCS) R3693650-1 08/18/21 11:17

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluoranthene	2.00	1.95	97.5	58.0-120	
Fluorene	2.00	1.88	94.0	50.0-118	
Indeno(1,2,3-cd)pyrene	2.00	1.75	87.5	48.0-130	
Naphthalene	2.00	1.75	87.5	43.0-114	
Phenanthrene	2.00	1.87	93.5	53.0-115	
Pyrene	2.00	2.12	106	53.0-121	
2-Methylnaphthalene	2.00	1.69	84.5	39.0-114	
2-Chloronaphthalene	2.00	1.78	89.0	34.0-111	
(S) Nitrobenzene-d5			*87.0*	*55.0-111*	
(S) 2-Fluorobiphenyl			*91.0*	*53.0-106*	
(S) p-Terphenyl-d14			*122*	*58.0-132*	
(S) 2-Methylnaphthalene-D10			*84.0*	*50.0-150*	
(S) Fluoranthene-D10			*98.5*	*50.0-150*	

L1390483-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390483-01 08/18/21 13:53 • (MS) R3693650-3 08/18/21 14:10 • (MSD) R3693650-4 08/18/21 14:28

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	1.92	0.0260	1.53	1.95	79.7	91.5	1	53.0-119		J3	24.1	20
Acenaphthene	1.92	0.0260	1.59	1.96	82.8	92.0	1	48.0-114		J3	20.8	20
Acenaphthylene	1.92	0.0260	1.65	2.00	85.9	93.9	1	35.0-121			19.2	20
Benzo(a)anthracene	1.92	0.0448	1.45	1.98	73.2	90.9	1	59.0-120		J3	30.9	20
Benzo(a)pyrene	1.92	0.0607	1.15	1.71	56.7	77.4	1	53.0-120		J3	39.2	20
Benzo(b)fluoranthene	1.92	0.0714	1.10	1.68	53.6	75.5	1	53.0-126		J3	41.7	20
Benzo(g,h,i)perylene	1.92	0.0502	0.447	0.684	20.7	29.8	1	44.0-128	J6	J3 J6	41.9	20
Benzo(k)fluoranthene	1.92	0.0327	1.20	1.78	60.8	82.0	1	54.0-125		J3	38.9	20
Chrysene	1.92	0.0390	1.53	2.05	77.7	94.4	1	57.0-120		J3	29.1	20
Dibenz(a,h)anthracene	1.92	0.0260	0.388	0.595	20.2	27.9	1	44.0-131	J6	J3 J6	42.1	20
Fluoranthene	1.92	0.0367	1.57	2.06	79.9	95.0	1	58.0-120		J3	27.0	20
Fluorene	1.92	0.0260	1.57	1.97	81.8	92.5	1	50.0-118		J3	22.6	20
Indeno(1,2,3-cd)pyrene	1.92	0.0459	0.429	0.669	20.0	29.3	1	48.0-130	J6	J3 J6	43.7	20
Naphthalene	1.92	0.260	1.55	1.85	80.7	86.9	1	43.0-114			17.6	20
Phenanthrene	1.92	0.0227	1.58	2.01	81.1	93.3	1	53.0-115		J3	24.0	20
Pyrene	1.92	0.0421	1.73	2.24	87.9	103	1	53.0-121		J3	25.7	20
2-Methylnaphthalene	1.92	0.260	1.47	1.80	76.6	84.5	1	39.0-114		J3	20.2	20
2-Chloronaphthalene	1.92	0.260	1.53	1.86	79.7	87.3	1	34.0-111			19.5	20
(S) Nitrobenzene-d5					*78.6*	*86.9*		*55.0-111*				
(S) 2-Fluorobiphenyl					*79.7*	*88.7*		*53.0-106*				

L1390483-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390483-01 08/18/21 13:53 • (MS) R3693650-3 08/18/21 14:10 • (MSD) R3693650-4 08/18/21 14:28

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
(S) p-Terphenyl-d14					*93.2*	*116*		*58.0-132*				
(S) 2-Methylnaphthalene-D10					*76.0*	*85.0*		*50.0-150*				
(S) Fluoranthene-D10					*82.3*	*95.3*		*50.0-150*				

Sample Narrative:

OS: Duplicate Analysis performed due to QC failure. Results don't confirm; both analyses reported

Method Blank (MB)

(MB) R3695656-2 08/22/21 12:19

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Benzo(a)anthracene	0.0316	J	0.0200	0.0250	0.0500
Benzo(a)pyrene	0.0306	J	0.0180	0.0250	0.0500
Benzo(b)fluoranthene	0.0510		0.0170	0.0250	0.0500
Benzo(g,h,i)perylene	0.0379	J	0.0180	0.0250	0.0500
Benzo(k)fluoranthene	0.0222	J	0.0200	0.125	0.250
Chrysene	0.0268	J	0.0180	0.0250	0.0500
Dibenz(a,h)anthracene	0.0250	U	0.0180	0.0250	0.0500
Fluoranthene	0.0156	J	0.0110	0.0250	0.0500
Indeno(1,2,3-cd)pyrene	0.0327	J	0.0180	0.0250	0.0500
Phenanthrene	0.0250	U	0.0180	0.0250	0.0500
Pyrene	0.0198	J	0.0170	0.0250	0.0500
(S) Nitrobenzene-d5	*76.5*				*55.0-111*
(S) 2-Methylnaphthalene-d10	*75.0*				*50.0-150*
(S) 2-Fluorobiphenyl	*80.0*				*53.0-106*
(S) Fluoranthene-d10	*85.5*				*50.0-150*
(S) p-Terphenyl-d14	*102*				*58.0-132*

Laboratory Control Sample (LCS)

(LCS) R3695656-1 08/22/21 11:59

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzo(a)anthracene	2.00	1.80	90.0	59.0-120	
Benzo(a)pyrene	2.00	1.72	86.0	53.0-120	
Benzo(b)fluoranthene	2.00	1.76	88.0	53.0-126	
Benzo(g,h,i)perylene	2.00	1.73	86.5	44.0-128	
Benzo(k)fluoranthene	2.00	1.74	87.0	54.0-125	
Chrysene	2.00	1.79	89.5	57.0-120	
Dibenz(a,h)anthracene	2.00	1.74	87.0	44.0-131	
Fluoranthene	2.00	1.78	89.0	58.0-120	
Indeno(1,2,3-cd)pyrene	2.00	1.76	88.0	48.0-130	
Phenanthrene	2.00	1.78	89.0	53.0-115	
Pyrene	2.00	1.80	90.0	53.0-121	
(S) Nitrobenzene-d5			*82.5*	*55.0-111*	
(S) 2-Methylnaphthalene-d10			*76.0*	*50.0-150*	
(S) 2-Fluorobiphenyl			*79.0*	*53.0-106*	
(S) Fluoranthene-d10			*85.5*	*50.0-150*	
(S) p-Terphenyl-d14			*102*	*58.0-132*	

Method Blank (MB)

(MB) R3693691-2 08/18/21 14:16

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Bis(2-chlorethoxy)methane	5.00	U	0.116	5.00	10.0
Bis(2-chloroethyl)ether	5.00	U	0.137	5.00	10.0
2,2-Oxybis(1-Chloropropane)	5.00	U	0.210	5.00	10.0
4-Bromophenyl-phenylether	5.00	U	0.0877	5.00	10.0
4-Chlorophenyl-phenylether	5.00	U	0.0926	5.00	10.0
3,3-Dichlorobenzidine	5.00	U	0.212	5.00	10.0
2,4-Dinitrotoluene	5.00	U	0.0983	5.00	10.0
2,6-Dinitrotoluene	5.00	U	0.250	5.00	10.0
Hexachlorobenzene	0.500	U	0.0755	0.500	1.00
Hexachloro-1,3-butadiene	5.00	U	0.0968	5.00	10.0
Hexachlorocyclopentadiene	5.00	U	0.0598	5.00	10.0
Hexachloroethane	5.00	U	0.127	5.00	10.0
Isophorone	5.00	U	0.143	5.00	10.0
Nitrobenzene	5.00	U	0.297	5.00	10.0
n-Nitrosodiphenylamine	5.00	U	2.37	5.00	10.0
n-Nitrosodi-n-propylamine	5.00	U	0.261	5.00	10.0
Benzylbutyl phthalate	1.50	U	0.765	1.50	3.00
Bis(2-ethylhexyl)phthalate	1.50	U	0.895	1.50	3.00
Di-n-butyl phthalate	1.50	U	0.453	1.50	3.00
Diethyl phthalate	1.50	U	0.287	1.50	3.00
Dimethyl phthalate	1.50	U	0.260	1.50	3.00
Di-n-octyl phthalate	1.50	U	0.932	1.50	3.00
4-Chloroaniline	5.00	U	0.234	5.00	10.0
4-Chloro-3-methylphenol	5.00	U	0.131	5.00	10.0
2-Chlorophenol	5.00	U	0.133	5.00	10.0
2,4-Dichlorophenol	5.00	U	0.102	5.00	10.0
2,4-Dimethylphenol	5.00	U	0.0636	5.00	10.0
4,6-Dinitro-2-methylphenol	5.00	U	1.12	5.00	10.0
2,4-Dinitrophenol	5.93	U	5.93	5.93	10.0
2-Methylphenol	5.00	U	0.929	5.00	10.0
3&4-Methyl Phenol	5.00	U	0.168	5.00	10.0
2-Nitroaniline	1.50	U	0.102	1.50	10.0
3-Nitroaniline	1.50	U	0.0869	1.50	10.0
4-Nitroaniline	1.50	U	0.0910	1.50	10.0
2-Nitrophenol	5.00	U	0.117	5.00	10.0
4-Nitrophenol	5.00	U	0.143	5.00	10.0
Pentachlorophenol	5.00	U	0.313	5.00	10.0
Phenol	5.00	U	4.33	5.00	10.0
2,4,5-Trichlorophenol	5.00	U	0.109	5.00	10.0
2,4,6-Trichlorophenol	5.00	U	0.100	5.00	10.0

Method Blank (MB)

(MB) R3693691-2 08/18/21 14:16

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Acetophenone	5.00	U	0.208	5.00	10.0
Atrazine	5.00	U	0.255	5.00	10.0
Benzaldehyde	5.00	U	1.69	5.00	10.0
Biphenyl	5.00	U	0.790	5.00	10.0
Caprolactam	5.00	U	0.309	5.00	10.0
Carbazole	5.00	U	0.111	5.00	10.0
1,2,4,5-Tetrachlorobenzene	1.50	U	0.0647	1.50	10.0
(S) 2-Fluorophenol	*38.0*				*19.0-119*
(S) Phenol-d5	*24.0*				*10.0-67.0*
(S) Nitrobenzene-d5	*55.3*				*44.0-120*
(S) 2-Fluorobiphenyl	*58.5*				*44.0-119*
(S) 2,4,6-Tribromophenol	*56.0*				*43.0-140*
(S) p-Terphenyl-d14	*54.2*				*50.0-134*

Laboratory Control Sample (LCS)

(LCS) R3693691-1 08/18/21 13:55

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bis(2-chlorethoxy)methane	50.0	31.5	63.0	48.0-120	
Bis(2-chloroethyl)ether	50.0	35.4	70.8	43.0-118	
2,2-Oxybis(1-Chloropropane)	50.0	32.0	64.0	37.0-130	
4-Bromophenyl-phenylether	50.0	38.0	76.0	55.0-124	
4-Chlorophenyl-phenylether	50.0	38.6	77.2	53.0-121	
3,3-Dichlorobenzidine	100	85.5	85.5	27.0-129	
2,4-Dinitrotoluene	50.0	45.3	90.6	57.0-128	
2,6-Dinitrotoluene	50.0	40.3	80.6	57.0-124	
Hexachlorobenzene	50.0	36.9	73.8	53.0-125	
Hexachloro-1,3-butadiene	50.0	29.7	59.4	22.0-124	
Hexachlorocyclopentadiene	50.0	22.7	45.4	10.0-121	
Hexachloroethane	50.0	27.8	55.6	21.0-115	
Isophorone	50.0	32.4	64.8	42.0-124	
Nitrobenzene	50.0	31.9	63.8	45.0-121	
n-Nitrosodiphenylamine	50.0	36.4	72.8	51.0-123	
n-Nitrosodi-n-propylamine	50.0	33.1	66.2	49.0-119	
Benzylbutyl phthalate	50.0	36.1	72.2	53.0-134	
Bis(2-ethylhexyl)phthalate	50.0	36.3	72.6	55.0-135	
Di-n-butyl phthalate	50.0	38.5	77.0	59.0-127	
Diethyl phthalate	50.0	39.1	78.2	56.0-125	

Laboratory Control Sample (LCS)

(LCS) R3693691-1 08/18/21 13:55

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dimethyl phthalate	50.0	38.9	77.8	45.0-127	
Di-n-octyl phthalate	50.0	36.4	72.8	51.0-140	
4-Chloroaniline	50.0	31.3	62.6	33.0-117	
4-Chloro-3-methylphenol	50.0	33.5	67.0	52.0-119	
2-Chlorophenol	50.0	34.1	68.2	38.0-117	
2,4-Dichlorophenol	50.0	34.7	69.4	47.0-121	
2,4-Dimethylphenol	50.0	33.9	67.8	31.0-124	
4,6-Dinitro-2-methylphenol	50.0	49.6	99.2	44.0-137	
2,4-Dinitrophenol	50.0	42.8	85.6	23.0-143	
2-Methylphenol	50.0	31.0	62.0	30.0-117	
3&4-Methyl Phenol	50.0	31.7	63.4	29.0-110	
2-Nitroaniline	50.0	40.1	80.2	55.0-127	
3-Nitroaniline	50.0	39.9	79.8	41.0-128	
4-Nitroaniline	50.0	45.2	90.4	35.0-124	
2-Nitrophenol	50.0	36.3	72.6	47.0-123	
4-Nitrophenol	50.0	19.6	39.2	10.0-120	
Pentachlorophenol	50.0	35.0	70.0	35.0-138	
Phenol	50.0	16.0	32.0	10.0-120	
2,4,5-Trichlorophenol	50.0	41.6	83.2	50.0-125	
2,4,6-Trichlorophenol	50.0	37.5	75.0	53.0-123	
Acetophenone	50.0	35.2	70.4	46.0-118	
Atrazine	50.0	45.1	90.2	44.0-142	
Benzaldehyde	50.0	78.9	158	11.7-132	J4
Biphenyl	50.0	34.6	69.2	49.0-115	
Caprolactam	50.0	16.3	32.6	10.0-40.4	
Carbazole	50.0	40.2	80.4	60.0-122	
1,2,4,5-Tetrachlorobenzene	50.0	33.5	67.0	35.0-121	
(S) 2-Fluorophenol			*46.5*	*19.0-119*	
(S) Phenol-d5			*30.7*	*10.0-67.0*	
(S) Nitrobenzene-d5			*64.6*	*44.0-120*	
(S) 2-Fluorobiphenyl			*72.2*	*44.0-119*	
(S) 2,4,6-Tribromophenol			*79.5*	*43.0-140*	
(S) p-Terphenyl-d14			*67.0*	*50.0-134*	

L1390185-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390185-03 08/18/21 19:39 • (MS) R3693691-3 08/18/21 20:01 • (MSD) R3693691-4 08/18/21 20:22

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bis(2-chlorethoxy)methane	50.0	5.00	30.1	25.3	60.2	50.6	1	48.0-120			17.3	20
Bis(2-chloroethyl)ether	50.0	5.00	33.1	25.8	66.2	51.6	1	43.0-118		J3	24.8	20
2,2-Oxybis(1-Chloropropane)	50.0	5.00	30.2	24.4	60.4	48.8	1	37.0-130		J3	21.2	20
4-Bromophenyl-phenylether	50.0	5.00	37.1	31.3	74.2	62.6	1	55.0-124			17.0	20
4-Chlorophenyl-phenylether	50.0	5.00	35.8	31.4	71.6	62.8	1	53.0-121			13.1	20
3,3-Dichlorobenzidine	100	5.00	72.1	65.6	72.1	65.6	1	27.0-129			9.44	20
2,4-Dinitrotoluene	50.0	5.00	38.9	34.8	77.8	69.6	1	57.0-128			11.1	20
2,6-Dinitrotoluene	50.0	5.00	35.9	32.0	71.8	64.0	1	57.0-124			11.5	20
Hexachlorobenzene	50.0	0.500	36.3	30.9	72.6	61.8	1	53.0-125			16.1	20
Hexachloro-1,3-butadiene	50.0	5.00	28.8	23.8	57.6	47.6	1	22.0-124			19.0	20
Hexachlorocyclopentadiene	50.0	5.00	23.0	18.3	46.0	36.6	1	10.0-121		J3	22.8	20
Hexachloroethane	50.0	5.00	27.2	21.3	54.4	42.6	1	21.0-115		J3	24.3	20
Isophorone	50.0	5.00	30.5	26.0	61.0	52.0	1	42.0-124			15.9	20
Nitrobenzene	50.0	5.00	29.9	24.9	59.8	49.8	1	45.0-121			18.2	20
n-Nitrosodiphenylamine	50.0	5.00	34.5	28.5	69.0	57.0	1	51.0-123			19.0	20
n-Nitrosodi-n-propylamine	50.0	5.00	32.2	26.2	64.4	52.4	1	49.0-119		J3	20.5	20
Benzylbutyl phthalate	50.0	1.50	34.6	30.7	69.2	61.4	1	53.0-134			11.9	20
Bis(2-ethylhexyl)phthalate	50.0	1.50	33.7	30.6	67.4	61.2	1	55.0-135			9.64	20
Di-n-butyl phthalate	50.0	1.50	36.1	32.6	72.2	65.2	1	59.0-127			10.2	20
Diethyl phthalate	50.0	1.50	35.0	31.6	70.0	63.2	1	56.0-125			10.2	20
Dimethyl phthalate	50.0	1.50	34.5	31.3	69.0	62.6	1	45.0-127			9.73	20
Di-n-octyl phthalate	50.0	1.50	33.8	30.8	67.6	61.6	1	51.0-140			9.29	20
4-Chloroaniline	50.0	5.00	28.9	24.0	57.8	48.0	1	33.0-117			18.5	20
4-Chloro-3-methylphenol	50.0	5.00	31.8	29.3	63.6	58.6	1	52.0-119			8.18	20
2-Chlorophenol	50.0	5.00	32.7	23.7	65.4	47.4	1	38.0-117		J3	31.9	20
2,4-Dichlorophenol	50.0	5.00	33.1	25.3	66.2	50.6	1	47.0-121		J3	26.7	20
2,4-Dimethylphenol	50.0	5.00	32.1	28.3	64.2	56.6	1	31.0-124			12.6	20
4,6-Dinitro-2-methylphenol	50.0	5.00	42.2	2.82	84.4	5.64	1	44.0-137		J3 J6	175	20
2,4-Dinitrophenol	50.0	5.93	34.3	5.93	68.6	0.000	1	23.0-143		J3 J6 U	200	20
2-Methylphenol	50.0	5.00	29.4	25.8	58.8	51.6	1	30.0-117			13.0	20
3&4-Methyl Phenol	50.0	5.00	30.5	27.5	61.0	55.0	1	29.0-110			10.3	20
2-Nitroaniline	50.0	1.50	35.4	33.2	70.8	66.4	1	55.0-127			6.41	20
3-Nitroaniline	50.0	1.50	34.5	32.3	69.0	64.6	1	41.0-128			6.59	20
4-Nitroaniline	50.0	1.50	36.7	36.0	73.4	72.0	1	35.0-124			1.93	20
2-Nitrophenol	50.0	5.00	34.0	20.6	68.0	41.2	1	47.0-123		J3 J6	49.1	20
4-Nitrophenol	50.0	5.00	16.7	64.1	33.4	128	1	10.0-120		J3 J5	117	20
Pentachlorophenol	50.0	5.00	33.5	5.30	67.0	10.6	1	35.0-138		J3 J6	145	20
Phenol	50.0	5.00	14.9	12.5	29.8	25.0	1	10.0-120			17.5	20
2,4,5-Trichlorophenol	50.0	5.00	38.4	25.6	76.8	51.2	1	50.0-125		J3	40.0	20
2,4,6-Trichlorophenol	50.0	5.00	34.6	15.2	69.2	30.4	1	53.0-123		J3 J6	77.9	20

L1390185-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1390185-03 08/18/21 19:39 • (MS) R3693691-3 08/18/21 20:01 • (MSD) R3693691-4 08/18/21 20:22

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetophenone	50.0	5.00	33.9	27.7	67.8	55.4	1	46.0-118		J3	20.1	20
Atrazine	50.0	5.00	38.2	36.7	76.4	73.4	1	44.0-142			4.01	20
Benzaldehyde	50.0	5.00	72.3	59.7	145	119	1	11.7-132	J5		19.1	20
Biphenyl	50.0	5.00	32.0	27.4	64.0	54.8	1	49.0-115			15.5	20
Caprolactam	50.0	5.00	15.5	13.9	31.0	27.8	1	10.0-40.4			10.9	20
Carbazole	50.0	5.00	36.2	32.7	72.4	65.4	1	60.0-122			10.2	20
1,2,4,5-Tetrachlorobenzene	50.0	1.50	33.9	27.7	67.8	55.4	1	35.0-121		J3	20.1	20
(S) 2-Fluorophenol					*42.7*	*19.9*		*19.0-119*				
(S) Phenol-d5					*28.2*	*23.3*		*10.0-67.0*				
(S) Nitrobenzene-d5					*58.3*	*47.2*		*44.0-120*				
(S) 2-Fluorobiphenyl					*65.5*	*55.1*		*44.0-119*				
(S) 2,4,6-Tribromophenol					*76.5*	*48.4*		*43.0-140*				
(S) p-Terphenyl-d14					*64.5*	*55.7*		*50.0-134*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

DL	Detection Limit.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
C6	The initial calibration verification standard (SSCV) associated with this data responded low.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P	RPD between the primary and confirmatory analysis exceeded 40%.

GLOSSARY OF TERMS

Qualifier	Description
Q	Sample was prepared and/or analyzed past holding time as defined in the method. Concentrations should be considered minimum values.
T8	Sample(s) received past/too close to holding time expiration.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC

106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

D220 290

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 2
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves		Lot # Bar Code (lab use only)
Project Name: NASA Ames PFAS			
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	VOC (8260)	SVOC (8270)	Metals (6010/7470)	PCB (8082)	TPH (GRO + DRO)	PAH (8310)	Herbicides (8151)	Pesticides (8081)	Hexavalent Chromium	Remarks / Cooler I.D.
IDW-GW-01-08112021	8/11/21	1000	G	x			7 8		1	7				X	X	X	X	X	X	X	X	X	1390235-01
IDW-GW-02-08112021	↓	1020	↓	x			↓		↓	↓				↓	↓	↓	↓	↓	↓	↓	↓	↓	02
IDW-GW-03-08112021	↓	1040	↓	x			↓		↓	↓				↓	↓	↓	↓	↓	↓	↓	↓	↓	03
IDW-GW-04-08112021	↓	1100	↓	x			↓		↓	↓				↓	↓	↓	↓	↓	↓	↓	↓	↓	04
IDW-GW-05-08112021	↓	1120	↓	x			↓		↓	↓				↓	↓	↓	↓	↓	↓	↓	↓	↓	05
IDW-GW-06-08112021	↓	1140	↓	x			↓		↓	↓				↓	↓	↓	↓	↓	↓	↓	↓	↓	06
IDW-GW-07-08112021	↓	1200	↓	x			↓		↓	↓				↓	↓	↓	↓	↓	↓	↓	↓	↓	07
IDW-GW-08-08112021	↓	1220	↓	x			↓		↓	↓				↓	↓	↓	↓	↓	↓	↓	↓	↓	08
IDW-GW-09-08112021	↓	1240	↓	x			7		6					↓	↓	↓	↓	↓	↓	↓	↓	↓	09

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	8/12/21	1100	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory received by: Bailee Rolman	8/13/21	0900

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. ____ °C
Temp Blank ☐ Y ☐ N

3 9+1 = 4.0
D3D

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC

106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 124291

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 2 of 2
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves		Lot # Bar Code (lab use only)
Project Name: NASA Ames PFAS			
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	VOC (8260)	SVOC (8270)	Metals (6010/7470)	PCB (8082)	TPH (GRO + DRO)	PAH (8310)	Herbicides (8151)	Pesticides (8081)	Hexavalent Chromium	Remarks / Cooler I.D.
1DW-GW-10-08112021	8/11/21	1300	G	x			8		1	7				x	x	x	x	x	x	x	x	x	1390235-10
1DW-GW-11-08112021	↓	1320	↓	x			8		1	7				↓	↓	↓	↓	↓	↓	↓	↓	↓	11
1DW-GW-12-08112021	↓	1340	↓	x			8		1	7				↓	↓	↓	↓	↓	↓	↓	↓	↓	12
~~1DW-GW-13-08112021~~		~~1400~~																					

CN 8/12/21

Sample Receipt Checklist

COC Seal Present/Intact:	Y N	If Applicable	
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres.Correct/Check:	Y N
Correct bottles used:	Y N		
Sufficient volume sent:	Y N		
RAD Screen <0.5 mR/hr:	Y N		

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TE [signature]	8/12/21	1100	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory received by: [signature]	8/13/21	0900

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. ____ °C
Temp Blank ☐ Y ☐ N

3.4+1=4.0
1/3 [initials]

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

5.8 ± 0 = 5.8 A6BL ~ 2825 0056 3832
2.5 - .1 = 2.4 A2 ~ 2825 0069 7844

On COC - 2825 0069 7855

1.6 + .1 = 1.7 A3 - 2825 0056 3821
5.2 ± 0 = 5.2 A6 - 2825 0036 4097
3.9 + .1 = 3.8 A2 - 2825 0036 4101

8/13/21 - NCF L1390235 TETRAOCA

R5

Time estimate: oh **Time spent:** oh

Members

Matthew Shacklock (responsible) Brian Ford Jason Romer

- [ ] Parameter(s) past holding time
- [ ] Temperature not in range
- [ ] Improper container type
- [ ] pH not in range
- [ ] Insufficient sample volume
- [ ] Sample is biphasic
- [ ] Vials received with headspace
- [x] Broken container
- [x] Sufficient sample remains
- [ ] If broken container: Insufficient packing material around container
- [ ] If broken container: Insufficient packing material inside cooler
- [ ] If broken container: Improper handling by carrier:_____
- [ ] If broken container: Sample was frozen
- [ ] If broken container: Container lid not intact
- [ ] Client informed by Call
- [ ] Client informed by Email
- [ ] Client informed by Voicemail
- [ ] Date/Time:_____
- [ ] PM initials:_____
- [ ] Client Contact:_____

Comments

Matthew Shacklock *13 August 2021 1:46 PM*

IDW-GW-01 received 1-250 AMB of 4 broken.
IDW-GW-09 received 1-250 AMB of 4 and 1-40ml AMB of 5 broken.

Jason Romer *13 August 2021 1:51 PM*

Run from remaining containers received intact

Matthew Shacklock *14 August 2021 8:29 AM*

Done.

Chain of Custody

Workorder: WH13098 Workorder Name: NASA ARC Owner Received Date: 13-08-21 Results Requested By: 27-08-21

Report To:	Subcontract To:
Kathy Smith Pace Analytical 106 Vantage Point Drive Columbia SC, 29223 803-227-2704 kathy.smith@pacelabs.com	Pace National 12065 Lebanon Road Mt. Juliet, TN 37122

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: NON					Requested Analysis: TCL 8260 - run from Methanol o	TCL 8270 including LL PAHs	TCL 8081	8082 - including Aroclor 1268	TAL 6010, 7471	8015 - GRO and DRO	TCL 8151	Hexavalent Chromium					LAB USE ONLY
1	IDW-GW-01-08112021		11-08-21 1000		water						x	x	x	x	x	x	x	x					
2	IDW-GW-02-08112021		11-08-21 1020		water						x	x	x	x	x	x	x	x					
3	IDW-GW-03-08112021		11-08-21 1040		water						X	X	X	X	X	X	X	X					
4	IDW-GW-04-08112021		11-08-21 1100		water						X	X	X	X	X	X	X	X					
5	IDW-GW-05-08112021		11-08-21 1120		water						X	X	X	X	X	X	X	X					
6	IDW-GW-06-08112021		11-08-21 1140		water						X	X	X	X	X	X	X	X					
7	IDW-GW-07-08112021		11-08-21 1200		water						X	X	X	X	X	X	X	X					
8	IDW-GW-08-08112021		11-08-21 1220		water						X	X	X	X	X	X	X	X					
9	IDW-GW-09-08112021		11-08-21 1240		water						X	X	X	X	X	X	X	X					
10	IDW-GW-10-08112021		11-08-21 1300		water						X	X	X	X	X	X	X	X					
11	IDW-GW-11-08112021		11-08-21 1320		water						X	X	X	X	X	X	X	X					
12	IDW-GW-12-08112021		11-08-21 1340		water						X	X	X	X	X	X	X	X					

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1					
2					
3					

Cooler Temperature on Receipt _____ °C | Custody Seal Y or N | Received on Ice Y or N | Sample Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

ANALYTICAL REPORT

October 20, 2021

Pace Analytical - West Columbia, SC

Sample Delivery Group:	L1416727
Samples Received:	08/10/2021
Project Number:	WH04020
Description:	NASA ARC
Site:	001
Report To:	Kathy Smith 106 Vantage Point Dr. West Columbia, SC 29172

Entire Report Reviewed By:

Nancy McLain
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

Cp: Cover Page 1

Tc: Table of Contents 2

Ss: Sample Summary 3

Cn: Case Narrative 5

Sr: Sample Results 6

IDW-S-03-073021 L1416727-01 6

IDW-S-04-073021 L1416727-02 7

IDW-S-05-073021 L1416727-03 8

IDW-S-06-073021 L1416727-04 9

IDW-S-01-073021 L1416727-05 10

IDW-S-02-073021 L1416727-06 11

IDW-S-07-073021 L1416727-07 12

IDW-S-08-073021 L1416727-08 13

Qc: Quality Control Summary 14

Total Solids by Method 2540 G-2011 14

Mercury by Method 7471B 16

Metals (ICP) by Method 6010D 17

Gl: Glossary of Terms 19

Al: Accreditations & Locations 20

Sc: Sample Chain of Custody 21

IDW-S-03-073021 L1416727-01 Solid

			Collected by	Collected date/time	Received date/time
				07/30/21 16:20	08/10/21 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1721157	1	08/11/21 13:32	08/11/21 13:38	MAS	Mt. Juliet, TN
Mercury by Method 7471B	WG1759650	1	10/19/21 15:12	10/20/21 08:38	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1759705	1	10/19/21 16:08	10/19/21 23:37	CCE	Mt. Juliet, TN

IDW-S-04-073021 L1416727-02 Solid

			Collected by	Collected date/time	Received date/time
				07/30/21 16:20	08/10/21 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1721157	1	08/11/21 13:32	08/11/21 13:38	MAS	Mt. Juliet, TN
Mercury by Method 7471B	WG1759650	1	10/19/21 15:12	10/20/21 08:41	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1759705	1	10/19/21 16:08	10/19/21 23:40	CCE	Mt. Juliet, TN

IDW-S-05-073021 L1416727-03 Solid

			Collected by	Collected date/time	Received date/time
				07/30/21 16:20	08/10/21 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1721157	1	08/11/21 13:32	08/11/21 13:38	MAS	Mt. Juliet, TN
Mercury by Method 7471B	WG1759650	1	10/19/21 15:12	10/20/21 08:43	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1759705	1	10/19/21 16:08	10/19/21 23:43	CCE	Mt. Juliet, TN

IDW-S-06-073021 L1416727-04 Solid

			Collected by	Collected date/time	Received date/time
				07/30/21 16:20	08/10/21 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1721157	1	08/11/21 13:32	08/11/21 13:38	MAS	Mt. Juliet, TN
Mercury by Method 7471B	WG1759650	1	10/19/21 15:12	10/20/21 08:45	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1759705	1	10/19/21 16:08	10/19/21 23:52	CCE	Mt. Juliet, TN

IDW-S-01-073021 L1416727-05 Solid

			Collected by	Collected date/time	Received date/time
				07/30/21 16:20	08/10/21 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1721157	1	08/11/21 13:32	08/11/21 13:38	MAS	Mt. Juliet, TN
Mercury by Method 7471B	WG1759650	1	10/19/21 15:12	10/20/21 08:48	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1759705	1	10/19/21 16:08	10/19/21 23:55	CCE	Mt. Juliet, TN

IDW-S-02-073021 L1416727-06 Solid

			Collected by	Collected date/time	Received date/time
				07/30/21 16:20	08/10/21 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1721157	1	08/11/21 13:32	08/11/21 13:38	MAS	Mt. Juliet, TN
Mercury by Method 7471B	WG1759650	1	10/19/21 15:12	10/20/21 08:55	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1759705	1	10/19/21 16:08	10/19/21 23:59	CCE	Mt. Juliet, TN

IDW-S-07-073021 L1416727-07 Solid

Collected by	Collected date/time	Received date/time
	07/30/21 16:20	08/10/21 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1721157	1	08/11/21 13:32	08/11/21 13:38	MAS	Mt. Juliet, TN
Mercury by Method 7471B	WG1759650	1	10/19/21 15:12	10/20/21 08:57	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1759705	1	10/19/21 16:08	10/20/21 00:02	CCE	Mt. Juliet, TN

IDW-S-08-073021 L1416727-08 Solid

Collected by	Collected date/time	Received date/time
	07/30/21 16:20	08/10/21 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1721850	1	08/12/21 12:58	08/12/21 13:07	MAS	Mt. Juliet, TN
Mercury by Method 7471B	WG1759650	1	10/19/21 15:12	10/20/21 09:00	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1759705	1	10/19/21 16:08	10/20/21 00:05	CCE	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Nancy McLain
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	73.8		1	08/11/2021 13:38	WG1721157

Mercury by Method 7471B

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Mercury	7439-97-6	0.0468	J T8	0.0244	0.0271	0.0542	1	10/20/2021 08:38	WG1759650

Metals (ICP) by Method 6010D

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Antimony	7440-36-0	0.678	U	0.678	0.678	2.71	1	10/19/2021 23:37	WG1759705
Arsenic	7440-38-2	1.63	J	0.624	0.678	2.71	1	10/19/2021 23:37	WG1759705
Barium	7440-39-3	195		0.325	0.339	0.678	1	10/19/2021 23:37	WG1759705
Beryllium	7440-41-7	0.547		0.108	0.136	0.271	1	10/19/2021 23:37	WG1759705
Calcium	7440-70-2	36400		40.7	67.8	136	1	10/19/2021 23:37	WG1759705
Chromium	7440-47-3	43.4		0.339	0.678	1.36	1	10/19/2021 23:37	WG1759705
Cobalt	7440-48-4	13.6		0.312	0.678	1.36	1	10/19/2021 23:37	WG1759705
Copper	7440-50-8	35.7		0.686	0.678	2.71	1	10/19/2021 23:37	WG1759705
Lead	7439-92-1	15.3		0.282	0.339	0.678	1	10/19/2021 23:37	WG1759705
Molybdenum	7439-98-7	0.339	U	0.271	0.339	0.678	1	10/19/2021 23:37	WG1759705
Nickel	7440-02-0	72.2		0.664	0.678	2.71	1	10/19/2021 23:37	WG1759705
Selenium	7782-49-2	1.07	J	0.836	0.678	2.71	1	10/19/2021 23:37	WG1759705
Silver	7440-22-4	0.339	U	0.309	0.339	1.36	1	10/19/2021 23:37	WG1759705
Thallium	7440-28-0	0.678	U	0.480	0.678	2.71	1	10/19/2021 23:37	WG1759705
Vanadium	7440-62-2	34.6		0.931	1.36	2.71	1	10/19/2021 23:37	WG1759705
Zinc	7440-66-6	74.3		1.27	3.39	6.78	1	10/19/2021 23:37	WG1759705

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	72.1		1	08/11/2021 13:38	WG1721157

Mercury by Method 7471B

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Mercury	7439-97-6	0.0805	T8	0.0250	0.0277	0.0555	1	10/20/2021 08:41	WG1759650

Metals (ICP) by Method 6010D

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Antimony	7440-36-0	0.701	J	0.693	0.693	2.77	1	10/19/2021 23:40	WG1759705
Arsenic	7440-38-2	2.66	J	0.638	0.693	2.77	1	10/19/2021 23:40	WG1759705
Barium	7440-39-3	161		0.333	0.347	0.693	1	10/19/2021 23:40	WG1759705
Beryllium	7440-41-7	0.558		0.111	0.139	0.277	1	10/19/2021 23:40	WG1759705
Calcium	7440-70-2	36500		41.6	69.3	139	1	10/19/2021 23:40	WG1759705
Chromium	7440-47-3	54.1		0.347	0.693	1.39	1	10/19/2021 23:40	WG1759705
Cobalt	7440-48-4	15.0		0.319	0.693	1.39	1	10/19/2021 23:40	WG1759705
Copper	7440-50-8	36.6		0.702	0.693	2.77	1	10/19/2021 23:40	WG1759705
Lead	7439-92-1	8.71		0.288	0.347	0.693	1	10/19/2021 23:40	WG1759705
Molybdenum	7439-98-7	0.347	U	0.277	0.347	0.693	1	10/19/2021 23:40	WG1759705
Nickel	7440-02-0	69.2		0.680	0.693	2.77	1	10/19/2021 23:40	WG1759705
Selenium	7782-49-2	3.36		0.856	0.693	2.77	1	10/19/2021 23:40	WG1759705
Silver	7440-22-4	0.347	U	0.316	0.347	1.39	1	10/19/2021 23:40	WG1759705
Thallium	7440-28-0	0.693	U	0.491	0.693	2.77	1	10/19/2021 23:40	WG1759705
Vanadium	7440-62-2	48.7		0.953	1.39	2.77	1	10/19/2021 23:40	WG1759705
Zinc	7440-66-6	63.1		1.30	3.47	6.93	1	10/19/2021 23:40	WG1759705

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	84.5		1	08/11/2021 13:38	WG1721157

Mercury by Method 7471B

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Mercury	7439-97-6	0.0795	T8	0.0213	0.0237	0.0473	1	10/20/2021 08:43	WG1759650

Metals (ICP) by Method 6010D

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Antimony	7440-36-0	0.693	J	0.592	0.592	2.37	1	10/19/2021 23:43	WG1759705
Arsenic	7440-38-2	1.12	J	0.544	0.592	2.37	1	10/19/2021 23:43	WG1759705
Barium	7440-39-3	127		0.284	0.296	0.592	1	10/19/2021 23:43	WG1759705
Beryllium	7440-41-7	0.465		0.0946	0.118	0.237	1	10/19/2021 23:43	WG1759705
Calcium	7440-70-2	28600		35.5	59.2	118	1	10/19/2021 23:43	WG1759705
Chromium	7440-47-3	95.6		0.296	0.592	1.18	1	10/19/2021 23:43	WG1759705
Cobalt	7440-48-4	23.4		0.272	0.592	1.18	1	10/19/2021 23:43	WG1759705
Copper	7440-50-8	54.9		0.599	0.592	2.37	1	10/19/2021 23:43	WG1759705
Lead	7439-92-1	5.44		0.246	0.296	0.592	1	10/19/2021 23:43	WG1759705
Molybdenum	7439-98-7	0.296	U	0.237	0.296	0.592	1	10/19/2021 23:43	WG1759705
Nickel	7440-02-0	89.9		0.580	0.592	2.37	1	10/19/2021 23:43	WG1759705
Selenium	7782-49-2	1.69	J	0.730	0.592	2.37	1	10/19/2021 23:43	WG1759705
Silver	7440-22-4	0.296	U	0.270	0.296	1.18	1	10/19/2021 23:43	WG1759705
Thallium	7440-28-0	0.592	U	0.419	0.592	2.37	1	10/19/2021 23:43	WG1759705
Vanadium	7440-62-2	84.0		0.813	1.18	2.37	1	10/19/2021 23:43	WG1759705
Zinc	7440-66-6	60.4		1.11	2.96	5.92	1	10/19/2021 23:43	WG1759705

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	71.8		1	08/11/2021 13:38	WG1721157

Mercury by Method 7471B

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Mercury	7439-97-6	0.0773	T8	0.0251	0.0278	0.0557	1	10/20/2021 08:45	WG1759650

Metals (ICP) by Method 6010D

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Antimony	7440-36-0	0.696	U	0.696	0.696	2.78	1	10/19/2021 23:52	WG1759705
Arsenic	7440-38-2	2.80		0.640	0.696	2.78	1	10/19/2021 23:52	WG1759705
Barium	7440-39-3	105		0.334	0.348	0.696	1	10/19/2021 23:52	WG1759705
Beryllium	7440-41-7	0.323		0.111	0.139	0.278	1	10/19/2021 23:52	WG1759705
Calcium	7440-70-2	35800		41.8	69.6	139	1	10/19/2021 23:52	WG1759705
Chromium	7440-47-3	30.5		0.348	0.696	1.39	1	10/19/2021 23:52	WG1759705
Cobalt	7440-48-4	28.9		0.320	0.696	1.39	1	10/19/2021 23:52	WG1759705
Copper	7440-50-8	22.2		0.704	0.696	2.78	1	10/19/2021 23:52	WG1759705
Lead	7439-92-1	5.66		0.289	0.348	0.696	1	10/19/2021 23:52	WG1759705
Molybdenum	7439-98-7	0.348	U	0.278	0.348	0.696	1	10/19/2021 23:52	WG1759705
Nickel	7440-02-0	41.0		0.682	0.696	2.78	1	10/19/2021 23:52	WG1759705
Selenium	7782-49-2	3.26		0.859	0.696	2.78	1	10/19/2021 23:52	WG1759705
Silver	7440-22-4	1.03	J	0.317	0.348	1.39	1	10/19/2021 23:52	WG1759705
Thallium	7440-28-0	0.696	U	0.493	0.696	2.78	1	10/19/2021 23:52	WG1759705
Vanadium	7440-62-2	30.2		0.956	1.39	2.78	1	10/19/2021 23:52	WG1759705
Zinc	7440-66-6	43.7		1.31	3.48	6.96	1	10/19/2021 23:52	WG1759705

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	93.5		1	08/11/2021 13:38	WG1721157

Mercury by Method 7471B

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Mercury	7439-97-6	0.0776	T8	0.0193	0.0214	0.0428	1	10/20/2021 08:48	WG1759650

Metals (ICP) by Method 6010D

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Antimony	7440-36-0	0.648	J	0.535	0.535	2.14	1	10/19/2021 23:55	WG1759705
Arsenic	7440-38-2	4.31		0.492	0.535	2.14	1	10/19/2021 23:55	WG1759705
Barium	7440-39-3	118		0.257	0.267	0.535	1	10/19/2021 23:55	WG1759705
Beryllium	7440-41-7	0.358		0.0856	0.107	0.214	1	10/19/2021 23:55	WG1759705
Calcium	7440-70-2	30300		32.1	53.5	107	1	10/19/2021 23:55	WG1759705
Chromium	7440-47-3	39.6		0.267	0.535	1.07	1	10/19/2021 23:55	WG1759705
Cobalt	7440-48-4	12.3		0.246	0.535	1.07	1	10/19/2021 23:55	WG1759705
Copper	7440-50-8	32.2		0.541	0.535	2.14	1	10/19/2021 23:55	WG1759705
Lead	7439-92-1	12.1		0.222	0.267	0.535	1	10/19/2021 23:55	WG1759705
Molybdenum	7439-98-7	0.267	U	0.214	0.267	0.535	1	10/19/2021 23:55	WG1759705
Nickel	7440-02-0	54.9		0.524	0.535	2.14	1	10/19/2021 23:55	WG1759705
Selenium	7782-49-2	1.48	J	0.660	0.535	2.14	1	10/19/2021 23:55	WG1759705
Silver	7440-22-4	0.267	U	0.244	0.267	1.07	1	10/19/2021 23:55	WG1759705
Thallium	7440-28-0	0.535	U	0.379	0.535	2.14	1	10/19/2021 23:55	WG1759705
Vanadium	7440-62-2	40.4		0.735	1.07	2.14	1	10/19/2021 23:55	WG1759705
Zinc	7440-66-6	56.2		1.00	2.67	5.35	1	10/19/2021 23:55	WG1759705

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	88.1		1	08/11/2021 13:38	WG1721157

Mercury by Method 7471B

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Mercury	7439-97-6	0.0840	T8	0.0204	0.0227	0.0454	1	10/20/2021 08:55	WG1759650

Metals (ICP) by Method 6010D

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Antimony	7440-36-0	1.06	J	0.568	0.568	2.27	1	10/19/2021 23:59	WG1759705
Arsenic	7440-38-2	6.29		0.522	0.568	2.27	1	10/19/2021 23:59	WG1759705
Barium	7440-39-3	160		0.273	0.284	0.568	1	10/19/2021 23:59	WG1759705
Beryllium	7440-41-7	0.431		0.0909	0.114	0.227	1	10/19/2021 23:59	WG1759705
Calcium	7440-70-2	52300		34.1	56.8	114	1	10/19/2021 23:59	WG1759705
Chromium	7440-47-3	43.6		0.284	0.568	1.14	1	10/19/2021 23:59	WG1759705
Cobalt	7440-48-4	15.2		0.261	0.568	1.14	1	10/19/2021 23:59	WG1759705
Copper	7440-50-8	41.4		0.575	0.568	2.27	1	10/19/2021 23:59	WG1759705
Lead	7439-92-1	19.9		0.236	0.284	0.568	1	10/19/2021 23:59	WG1759705
Molybdenum	7439-98-7	0.284	U	0.227	0.284	0.568	1	10/19/2021 23:59	WG1759705
Nickel	7440-02-0	57.0		0.556	0.568	2.27	1	10/19/2021 23:59	WG1759705
Selenium	7782-49-2	3.73		0.701	0.568	2.27	1	10/19/2021 23:59	WG1759705
Silver	7440-22-4	0.284	U	0.259	0.284	1.14	1	10/19/2021 23:59	WG1759705
Thallium	7440-28-0	0.568	U	0.402	0.568	2.27	1	10/19/2021 23:59	WG1759705
Vanadium	7440-62-2	50.8		0.780	1.14	2.27	1	10/19/2021 23:59	WG1759705
Zinc	7440-66-6	73.6		1.07	2.84	5.68	1	10/19/2021 23:59	WG1759705

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	79.0		1	08/11/2021 13:38	WG1721157

Mercury by Method 7471B

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Mercury	7439-97-6	0.0640	T8	0.0228	0.0253	0.0507	1	10/20/2021 08:57	WG1759650

Metals (ICP) by Method 6010D

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Antimony	7440-36-0	0.819	J	0.633	0.633	2.53	1	10/20/2021 00:02	WG1759705
Arsenic	7440-38-2	2.76		0.583	0.633	2.53	1	10/20/2021 00:02	WG1759705
Barium	7440-39-3	136		0.304	0.317	0.633	1	10/20/2021 00:02	WG1759705
Beryllium	7440-41-7	0.386		0.101	0.127	0.253	1	10/20/2021 00:02	WG1759705
Calcium	7440-70-2	26800		38.0	63.3	127	1	10/20/2021 00:02	WG1759705
Chromium	7440-47-3	42.5		0.317	0.633	1.27	1	10/20/2021 00:02	WG1759705
Cobalt	7440-48-4	13.2		0.291	0.633	1.27	1	10/20/2021 00:02	WG1759705
Copper	7440-50-8	25.7		0.641	0.633	2.53	1	10/20/2021 00:02	WG1759705
Lead	7439-92-1	6.02		0.263	0.317	0.633	1	10/20/2021 00:02	WG1759705
Molybdenum	7439-98-7	0.317	U	0.253	0.317	0.633	1	10/20/2021 00:02	WG1759705
Nickel	7440-02-0	55.6		0.621	0.633	2.53	1	10/20/2021 00:02	WG1759705
Selenium	7782-49-2	1.08	J	0.781	0.633	2.53	1	10/20/2021 00:02	WG1759705
Silver	7440-22-4	0.317	U	0.289	0.317	1.27	1	10/20/2021 00:02	WG1759705
Thallium	7440-28-0	0.633	U	0.448	0.633	2.53	1	10/20/2021 00:02	WG1759705
Vanadium	7440-62-2	40.0		0.870	1.27	2.53	1	10/20/2021 00:02	WG1759705
Zinc	7440-66-6	43.6		1.19	3.17	6.33	1	10/20/2021 00:02	WG1759705

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	84.5		1	08/12/2021 13:07	WG1721850

Mercury by Method 7471B

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Mercury	7439-97-6	0.0559	T8	0.0213	0.0237	0.0473	1	10/20/2021 09:00	WG1759650

Metals (ICP) by Method 6010D

Analyte	CAS #	Result (dry)	Qualifier	DL (dry)	LOD (dry)	LOQ (dry)	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg	mg/kg		date / time	
Antimony	7440-36-0	0.592	U	0.592	0.592	2.37	1	10/20/2021 00:05	WG1759705
Arsenic	7440-38-2	2.13	J	0.544	0.592	2.37	1	10/20/2021 00:05	WG1759705
Barium	7440-39-3	101		0.284	0.296	0.592	1	10/20/2021 00:05	WG1759705
Beryllium	7440-41-7	0.310		0.0947	0.118	0.237	1	10/20/2021 00:05	WG1759705
Calcium	7440-70-2	26700		35.5	59.2	118	1	10/20/2021 00:05	WG1759705
Chromium	7440-47-3	36.8		0.296	0.592	1.18	1	10/20/2021 00:05	WG1759705
Cobalt	7440-48-4	32.9		0.272	0.592	1.18	1	10/20/2021 00:05	WG1759705
Copper	7440-50-8	22.1		0.599	0.592	2.37	1	10/20/2021 00:05	WG1759705
Lead	7439-92-1	4.84		0.246	0.296	0.592	1	10/20/2021 00:05	WG1759705
Molybdenum	7439-98-7	0.296	U	0.237	0.296	0.592	1	10/20/2021 00:05	WG1759705
Nickel	7440-02-0	44.0		0.580	0.592	2.37	1	10/20/2021 00:05	WG1759705
Selenium	7782-49-2	1.94	J	0.730	0.592	2.37	1	10/20/2021 00:05	WG1759705
Silver	7440-22-4	0.949	J	0.270	0.296	1.18	1	10/20/2021 00:05	WG1759705
Thallium	7440-28-0	0.592	U	0.419	0.592	2.37	1	10/20/2021 00:05	WG1759705
Vanadium	7440-62-2	35.3		0.813	1.18	2.37	1	10/20/2021 00:05	WG1759705
Zinc	7440-66-6	39.4		1.11	2.96	5.92	1	10/20/2021 00:05	WG1759705

Method Blank (MB)

(MB) R3690958-1 08/11/21 13:38

Analyte	MB Result %	MB Qualifier	MB DL %	MB LOD %	MB LOQ %
Total Solids	0.000			0.100	

L1388629-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1388629-04 08/11/21 13:38 • (DUP) R3690958-3 08/11/21 13:38

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	71.8	70.7	1	1.57		5

Laboratory Control Sample (LCS)

(LCS) R3690958-2 08/11/21 13:38

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3691566-1 08/12/21 13:07

Analyte	MB Result %	MB Qualifier	MB DL %	MB LOD %	MB LOQ %
Total Solids	0.000			0.100	

L1388067-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1388067-09 08/12/21 13:07 • (DUP) R3691566-3 08/12/21 13:07

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	92.3	92.1	1	0.183		5

Laboratory Control Sample (LCS)

(LCS) R3691566-2 08/12/21 13:07

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3718853-1 10/20/21 08:26

Analyte	MB Result mg/kg	MB Qualifier	MB DL mg/kg	MB LOD mg/kg	MB LOQ mg/kg
Mercury	0.0200	U	0.0180	0.0200	0.0400

Laboratory Control Sample (LCS)

(LCS) R3718853-2 10/20/21 08:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.537	107	80.0-124	

L1418039-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1418039-02 10/20/21 08:31 • (MS) R3718853-3 10/20/21 08:33 • (MSD) R3718853-4 10/20/21 08:36

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.500	0.0200	0.533	0.470	107	94.0	1	80.0-124			12.5	20

QUALITY CONTROL SUMMARY

L1416727-01,02,03,04,05,06,07,08

Method Blank (MB)

(MB) R3718888-1 10/19/21 23:16

Analyte	MB Result mg/kg	MB Qualifier	MB DL mg/kg	MB LOD mg/kg	MB LOQ mg/kg
Antimony	0.500	U	0.500	0.500	2.00
Arsenic	0.500	U	0.460	0.500	2.00
Barium	0.250	U	0.240	0.250	0.500
Beryllium	0.100	U	0.0800	0.100	0.200
Calcium	50.0	U	30.0	50.0	100
Chromium	0.500	U	0.250	0.500	1.00
Cobalt	0.500	U	0.230	0.500	1.00
Copper	0.500	U	0.506	0.500	2.00
Lead	0.209	J	0.208	0.250	0.500
Molybdenum	0.250	U	0.200	0.250	0.500
Nickel	0.500	U	0.490	0.500	2.00
Selenium	0.500	U	0.617	0.500	2.00
Silver	0.250	U	0.228	0.250	1.00
Thallium	0.500	U	0.354	0.500	2.00
Vanadium	1.00	U	0.687	1.00	2.00
Zinc	2.50	U	0.939	2.50	5.00

Laboratory Control Sample (LCS)

(LCS) R3718888-2 10/19/21 23:19

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	100	91.5	91.5	79.0-114	
Arsenic	100	90.7	90.7	82.0-111	
Barium	100	94.2	94.2	83.0-113	
Beryllium	100	93.5	93.5	83.0-113	
Calcium	1000	925	92.5	81.0-116	
Chromium	100	92.1	92.1	85.0-113	
Cobalt	100	93.5	93.5	85.0-112	
Copper	100	92.6	92.6	81.0-117	
Lead	100	92.4	92.4	81.0-112	
Molybdenum	100	96.4	96.4	82.0-116	
Nickel	100	93.2	93.2	83.0-113	
Selenium	100	92.2	92.2	78.0-111	
Silver	20.0	17.0	85.0	82.0-112	
Thallium	100	91.4	91.4	83.0-111	
Vanadium	100	93.9	93.9	82.0-114	
Zinc	100	91.3	91.3	82.0-113	

L1417507-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1417507-01 10/19/21 23:22 • (MS) R3718888-5 10/19/21 23:31 • (MSD) R3718888-6 10/19/21 23:34

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	110	0.630	103	102	93.1	92.3	1	79.0-114			0.878	20
Arsenic	110	4.64	114	113	99.6	99.1	1	82.0-111			0.500	20
Barium	110	45.6	147	143	92.0	88.4	1	83.0-113			2.75	20
Beryllium	110	0.202	108	106	98.5	96.0	1	83.0-113			2.55	20
Chromium	110	9.64	113	114	93.7	95.3	1	85.0-113			1.51	20
Cobalt	110	4.17	114	113	100	99.0	1	85.0-112			1.26	20
Copper	110	32.7	143	135	101	93.1	1	81.0-117			6.07	20
Lead	110	85.5	176	185	82.5	90.7	1	81.0-112			5.00	20
Molybdenum	110	0.274	109	107	99.2	97.1	1	82.0-116			2.15	20
Nickel	110	10.5	120	118	100	97.8	1	83.0-113			2.21	20
Selenium	110	2.98	112	113	99.3	101	1	78.0-111			1.24	20
Silver	22.0	0.274	20.7	20.3	94.2	92.7	1	82.0-112			1.58	20
Thallium	110	0.549	103	101	93.7	91.8	1	83.0-111			1.98	20
Vanadium	110	11.5	117	114	96.2	93.7	1	82.0-114			2.38	20
Zinc	110	48.3	145	134	88.1	78.3	1	82.0-113		J6	7.72	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
DL	Detection Limit.
DL (dry)	Detection Limit.
LOD (dry)	Limit of Detection.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
LOQ (dry)	Limit of Quantitation.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

E080

Chain of Custody

Pace Analytical®

Workorder: WH04020 | Workorder Name: NASA ARC | Owner Received Date: 8/5/2021 | Results Requested By: 8/23/2021

Report To:

Kathy Smith
Pace Analytical
106 Vantage Point Drive
Colubmia SC, 29223
803-227-2704
kathy.smith@pacelabs.com

Subcontract To:

Pace National
12065 Lebanon Road
Mt. Juliet, TN 37122

14/6727

MS 10/12

L1388629

Item	Sample ID	Sample Type	Collect Date/Time		Lab ID	Matrix	Preserved Containers: NON	TCL 8260 - run from Methanol o	TCL 8270 including LL PAHs	TCL 8081	8082 - including Aroclor 1268	TAL 6010, 7471	8015 - GRO and DRO	TCL 8151	Hexavalent Chromium			TCL 8260		LAB USE ONLY
1	IDW-S-03-073021		7/30/2021	1620		soil		x	x	x	x	x	x	x	x					-01
2	IDW-S-04-073021		7/30/2021	1620		soil		x	x	x	x	x	x	x	x					-02
3	IDW-S-05-073021		7/30/2021	1620		soil		X	X	X	X	X	X	X	X					-03
4	IDW-S-06-073021		7/30/2021	1620		soil		X	X	X	X	X	X	X	X					-04
5	IDW-S-01-073021		7/30/2021	1620		soil		X	X	X	X	X	X	X	X					-05
6	IDW-S-02-073021		7/30/2021	1620		soil		X	X	X	X	X	X	X	X					-06
7	IDW-S-07-073021		7/30/2021	1620		soil		X	X	X	X	X	X	X	X					-07
8	IDW-S-08-073021		7/30/2021	1620		soil		X	X	X	X	X	X	X	X					-08
9	TB-01-073021		7/30/2021	0		Water												X		-09
10	TB-02-073021		7/30/2021	0		Water												X		-10
11	TB-03-073021		7/30/2021	0		Water												X		-11
12	TB-04-073021		7/30/2021	0		Water												X		-12

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1	Jacque Smith	8/9/21 1900			
2					
3			[signature]	8/10/21	15:00

Cooler Temperature on Receipt _____ °C | Custody Seal Y or N | Received on Ice Y or N | Sample Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM

A6KH
3.3+.1=3.4
COCS1

FMT-ALL-C-002rev.00 24March2009

Sample Receipt Checklist

COC Seal Present/Intact: X N
COC Signed/Accurate: X N
Bottles arrive intact: X N
Correct bottles used: X N
Sufficient volume sent: X N
RAD Screen <0.5 mR/hr: X N

If Applicable
VOA Zero Headspace: Y N
Pres.Correct/Check: Y N

L1388629 PACEWCSC Relog - EX due 10/19

R3/R4/RX/EX

Please relog L138629-01 thru -08 for DOD metals. $0. Transfer TS.

SB, AS, BA, BE, CD, CR, CO, CU, PB, HG, MO, NI, SE, AG, TL, V, ZN - 6010

Time estimate: 0h **Time spent:** 0h

Members

Christl Wagner (responsible)

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dahlquist

Project Name: NASA Ames PFAS

Project Number: 1031G667601

Lot Number:**WG10017**

Date Completed:07/26/2021

07/27/2021 10:42 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Tetra Tech
Lot Number: WG10017

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

The method blank associated with batch 99118 had PFOA detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for PFOA have been flagged with a "B".

For sample WG10017-003, WG10017-011 sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Surrogate recovery may be adversely affected.

6:2FTS surrogate recovery for the method blank associated with the following samples was outside the upper control limit: WG10017-001, WG10017-002, WG10017-003, WG10017-004, WG10017-005, WG10017-006, WG10017-007. This method blank did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: WG10017-004. Re-extraction (LDUP) and/or re-analysis was performed with concurring results. Both sets of data have been reported.

The continuing calibration verification (CCV) associated with samples WG10017-001, WG10017-002, WG10017-003, WG10017-004, WG10017-005, WG10017-006, WG10017-007 for analyte: GenX recovered above the upper control limit. The sample(s) associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

The PFTeDA surrogate in laboratory control sample (LCS) for prep batch 98815 recovered outside acceptance criteria. For the following samples there was an insufficient amount to perform a re-extraction or re-analysis: WG10017-002, WG10017-004. The data has been reported.

Sample WG10017-001, WG10017-020 required centrifugation prior to extraction, due to excessive solids present in the sample. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Sample concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

Surrogate recovery for the following sample was outside control limits: WG10017-003, WG10017-014. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside the upper control limit: WG10017-013. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

Tetra Tech

Lot Number: WG10017

Project Name: NASA Ames PFAS

Project Number: 1031G667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC10-WGC2-6-070721	Aqueous	07/07/2021 1057	07/10/2021
002	AOPC10-WGC2-12-070721	Aqueous	07/07/2021 1203	07/10/2021
003	AOPC10-WGC2-12-070721-FD	Aqueous	07/07/2021 1203	07/10/2021
004	AOPC10-WGC2-4-070721	Aqueous	07/07/2021 1308	07/10/2021
005	AOPC10-WGC2-5-070721	Aqueous	07/07/2021 1340	07/10/2021
006	ERB-01-070721	Aqueous	07/08/2021 0900	07/10/2021
007	FB-01-070721	Aqueous	07/07/2021 1700	07/10/2021
008	AOPC17-W3-20-070721	Aqueous	07/07/2021 1445	07/10/2021
009	AOPC17-W3-1-070721	Aqueous	07/07/2021 1655	07/10/2021
010	AOPC17-W3-8-070821	Aqueous	07/08/2021 1035	07/10/2021
011	AOPC16-WU5-9-070821	Aqueous	07/08/2021 1345	07/10/2021
012	FB-02-070821	Aqueous	07/08/2021 1500	07/10/2021
013	AOPC9,16-W2-16-070821	Aqueous	07/08/2021 1300	07/10/2021
014	AOPC8-W1-20-070921	Aqueous	07/09/2021 1307	07/10/2021
015	AOPC8-W1-19-070921	Aqueous	07/09/2021 1400	07/10/2021
016	AOPC8-W1-19-070921-FD	Aqueous	07/09/2021 1405	07/10/2021
017	AOPC8-W1-1R-070921	Aqueous	07/09/2021 1320	07/10/2021
018	AOPC8-W1-14-070921	Aqueous	07/09/2021 1550	07/10/2021
019	AOPC8-W1-5-070921	Aqueous	07/09/2021 1520	07/10/2021
020	AOPC26-W5-3-070821	Aqueous	07/08/2021 1510	07/10/2021
021	FB-03-070921	Aqueous	07/09/2021 1540	07/10/2021

(21 samples)

Detection Summary

Tetra Tech

Lot Number: WG10017

Project Name: NASA Ames PFAS

Project Number: 1031G667601

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	AOPC10-WGC2-6-070721	Aqueous	6:2 FTS	PFAS by ID	21		ng/L	9
001	AOPC10-WGC2-6-070721	Aqueous	PFBS	PFAS by ID	1.6	J	ng/L	9
001	AOPC10-WGC2-6-070721	Aqueous	PFHxS	PFAS by ID	2.2	J	ng/L	9
001	AOPC10-WGC2-6-070721	Aqueous	PFBA	PFAS by ID	6.8		ng/L	9
001	AOPC10-WGC2-6-070721	Aqueous	PFOA	PFAS by ID	1.0	J	ng/L	9
002	AOPC10-WGC2-12-070721	Aqueous	6:2 FTS	PFAS by ID	6.9	J	ng/L	11
002	AOPC10-WGC2-12-070721	Aqueous	PFBS	PFAS by ID	1.1	J	ng/L	11
002	AOPC10-WGC2-12-070721	Aqueous	PFHxS	PFAS by ID	5.4		ng/L	11
002	AOPC10-WGC2-12-070721	Aqueous	PFBA	PFAS by ID	4.1		ng/L	11
002	AOPC10-WGC2-12-070721	Aqueous	PFOA	PFAS by ID	3.7		ng/L	11
003	AOPC10-WGC2-12-070721-FD	Aqueous	6:2 FTS	PFAS by ID	9.9		ng/L	13
003	AOPC10-WGC2-12-070721-FD	Aqueous	PFBS	PFAS by ID	1.2	J	ng/L	13
003	AOPC10-WGC2-12-070721-FD	Aqueous	PFHxS	PFAS by ID	5.0		ng/L	13
003	AOPC10-WGC2-12-070721-FD	Aqueous	PFBA	PFAS by ID	4.1		ng/L	13
003	AOPC10-WGC2-12-070721-FD	Aqueous	PFOA	PFAS by ID	3.2	J	ng/L	13
004	AOPC10-WGC2-4-070721	Aqueous	6:2 FTS	PFAS by ID	19		ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFBS	PFAS by ID	31		ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFPeS	PFAS by ID	4.4		ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFHxS	PFAS by ID	25		ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFBA	PFAS by ID	34	Q	ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFDA	PFAS by ID	1.3	J	ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFHpA	PFAS by ID	12		ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFHxA	PFAS by ID	27		ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFNA	PFAS by ID	2.1	J	ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFOA	PFAS by ID	17		ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFPeA	PFAS by ID	26		ng/L	15
004	AOPC10-WGC2-4-070721	Aqueous	PFOS	PFAS by ID	34		ng/L	15
005	AOPC10-WGC2-5-070721	Aqueous	6:2 FTS	PFAS by ID	5.6	J	ng/L	17
005	AOPC10-WGC2-5-070721	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	17
005	AOPC10-WGC2-5-070721	Aqueous	PFHxS	PFAS by ID	4.5		ng/L	17
005	AOPC10-WGC2-5-070721	Aqueous	PFBA	PFAS by ID	6.1		ng/L	17
005	AOPC10-WGC2-5-070721	Aqueous	PFHpA	PFAS by ID	1.1	J	ng/L	17
005	AOPC10-WGC2-5-070721	Aqueous	PFOA	PFAS by ID	11		ng/L	17
005	AOPC10-WGC2-5-070721	Aqueous	PFPeA	PFAS by ID	2.3	J	ng/L	17
005	AOPC10-WGC2-5-070721	Aqueous	PFOS	PFAS by ID	2.4	J	ng/L	17
008	AOPC17-W3-20-070721	Aqueous	6:2 FTS	PFAS by ID	14		ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFBS	PFAS by ID	12		ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFHpS	PFAS by ID	2.1	J	ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFOSA	PFAS by ID	3.8	J	ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFPeS	PFAS by ID	11		ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFHxS	PFAS by ID	130		ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFBA	PFAS by ID	19		ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFHpA	PFAS by ID	10		ng/L	23

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
008	AOPC17-W3-20-070721	Aqueous	PFHxA	PFAS by ID	12		ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFNA	PFAS by ID	1.5	J	ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFOA	PFAS by ID	160	B	ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFPeA	PFAS by ID	4.8		ng/L	23
008	AOPC17-W3-20-070721	Aqueous	PFOS	PFAS by ID	99		ng/L	23
009	AOPC17-W3-1-070721	Aqueous	6:2 FTS	PFAS by ID	8.3		ng/L	25
009	AOPC17-W3-1-070721	Aqueous	PFBS	PFAS by ID	8.0		ng/L	25
009	AOPC17-W3-1-070721	Aqueous	PFHpS	PFAS by ID	1.1	J	ng/L	25
009	AOPC17-W3-1-070721	Aqueous	PFPeS	PFAS by ID	5.8		ng/L	25
009	AOPC17-W3-1-070721	Aqueous	PFHxS	PFAS by ID	56		ng/L	25
009	AOPC17-W3-1-070721	Aqueous	PFBA	PFAS by ID	15		ng/L	25
009	AOPC17-W3-1-070721	Aqueous	PFHpA	PFAS by ID	1.1	J	ng/L	25
009	AOPC17-W3-1-070721	Aqueous	PFHxA	PFAS by ID	1.0	J	ng/L	25
009	AOPC17-W3-1-070721	Aqueous	PFOA	PFAS by ID	44	B	ng/L	25
009	AOPC17-W3-1-070721	Aqueous	PFOS	PFAS by ID	39		ng/L	25
010	AOPC17-W3-8-070821	Aqueous	6:2 FTS	PFAS by ID	4.1	J	ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFBS	PFAS by ID	37		ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFHpS	PFAS by ID	5.7		ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFPeS	PFAS by ID	29		ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFHxS	PFAS by ID	190		ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFBA	PFAS by ID	96		ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFHpA	PFAS by ID	1.9	J	ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFHxA	PFAS by ID	7.2		ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFNA	PFAS by ID	1.4	J	ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFOA	PFAS by ID	48	B	ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFPeA	PFAS by ID	12		ng/L	27
010	AOPC17-W3-8-070821	Aqueous	PFOS	PFAS by ID	150		ng/L	27
011	AOPC16-WU5-9-070821	Aqueous	6:2 FTS	PFAS by ID	8.4	J	ng/L	29
011	AOPC16-WU5-9-070821	Aqueous	PFBS	PFAS by ID	6.6		ng/L	29
011	AOPC16-WU5-9-070821	Aqueous	PFPeS	PFAS by ID	2.0	J	ng/L	29
011	AOPC16-WU5-9-070821	Aqueous	PFHxS	PFAS by ID	40		ng/L	29
011	AOPC16-WU5-9-070821	Aqueous	PFBA	PFAS by ID	16		ng/L	29
011	AOPC16-WU5-9-070821	Aqueous	PFHpA	PFAS by ID	3.5	J	ng/L	29
011	AOPC16-WU5-9-070821	Aqueous	PFHxA	PFAS by ID	6.4	J	ng/L	29
011	AOPC16-WU5-9-070821	Aqueous	PFOA	PFAS by ID	44	B	ng/L	29
011	AOPC16-WU5-9-070821	Aqueous	PFPeA	PFAS by ID	6.6		ng/L	29
011	AOPC16-WU5-9-070821	Aqueous	PFOS	PFAS by ID	47		ng/L	29
013	AOPC9,16-W2-16-070821	Aqueous	6:2 FTS	PFAS by ID	54		ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFBS	PFAS by ID	67		ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFHpS	PFAS by ID	15		ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFOSA	PFAS by ID	1.7	J	ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFPeS	PFAS by ID	68		ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFHxS	PFAS by ID	500		ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFBA	PFAS by ID	46		ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFHpA	PFAS by ID	39		ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFHxA	PFAS by ID	150		ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFNA	PFAS by ID	5.9		ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFOA	PFAS by ID	230	B	ng/L	33

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
013	AOPC9,16-W2-16-070821	Aqueous	PFPeA	PFAS by ID	83		ng/L	33
013	AOPC9,16-W2-16-070821	Aqueous	PFOS	PFAS by ID	500		ng/L	33
014	AOPC8-W1-20-070921	Aqueous	6:2 FTS	PFAS by ID	6.0	J	ng/L	35
014	AOPC8-W1-20-070921	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	35
014	AOPC8-W1-20-070921	Aqueous	PFBA	PFAS by ID	4.4		ng/L	35
014	AOPC8-W1-20-070921	Aqueous	PFHpA	PFAS by ID	2.8	J	ng/L	35
014	AOPC8-W1-20-070921	Aqueous	PFHxA	PFAS by ID	15		ng/L	35
014	AOPC8-W1-20-070921	Aqueous	PFOA	PFAS by ID	110	BS	ng/L	35
014	AOPC8-W1-20-070921	Aqueous	PFPeA	PFAS by ID	4.9		ng/L	35
015	AOPC8-W1-19-070921	Aqueous	6:2 FTS	PFAS by ID	160		ng/L	37
015	AOPC8-W1-19-070921	Aqueous	PFBA	PFAS by ID	1.0	J	ng/L	37
016	AOPC8-W1-19-070921-FD	Aqueous	6:2 FTS	PFAS by ID	160		ng/L	39
016	AOPC8-W1-19-070921-FD	Aqueous	PFBA	PFAS by ID	0.92	J	ng/L	39
016	AOPC8-W1-19-070921-FD	Aqueous	PFOA	PFAS by ID	1.3	BJ	ng/L	39
017	AOPC8-W1-1R-070921	Aqueous	6:2 FTS	PFAS by ID	110		ng/L	41
017	AOPC8-W1-1R-070921	Aqueous	PFBA	PFAS by ID	1.7	J	ng/L	41
018	AOPC8-W1-14-070921	Aqueous	PFBS	PFAS by ID	6.9		ng/L	43
018	AOPC8-W1-14-070921	Aqueous	PFPeS	PFAS by ID	2.4	J	ng/L	43
018	AOPC8-W1-14-070921	Aqueous	PFHxS	PFAS by ID	6.3		ng/L	43
018	AOPC8-W1-14-070921	Aqueous	PFBA	PFAS by ID	10		ng/L	43
018	AOPC8-W1-14-070921	Aqueous	PFHpA	PFAS by ID	2.4	J	ng/L	43
018	AOPC8-W1-14-070921	Aqueous	PFHxA	PFAS by ID	26		ng/L	43
018	AOPC8-W1-14-070921	Aqueous	PFOA	PFAS by ID	6.5	B	ng/L	43
018	AOPC8-W1-14-070921	Aqueous	PFPeA	PFAS by ID	13		ng/L	43
018	AOPC8-W1-14-070921	Aqueous	PFOS	PFAS by ID	2.8	J	ng/L	43
019	AOPC8-W1-5-070921	Aqueous	6:2 FTS	PFAS by ID	79		ng/L	45
019	AOPC8-W1-5-070921	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	45
019	AOPC8-W1-5-070921	Aqueous	PFBA	PFAS by ID	3.7		ng/L	45
019	AOPC8-W1-5-070921	Aqueous	PFHxA	PFAS by ID	1.3	J	ng/L	45
019	AOPC8-W1-5-070921	Aqueous	PFOA	PFAS by ID	1.4	BJ	ng/L	45
020	AOPC26-W5-3-070821	Aqueous	8:2 FTS	PFAS by ID	37		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	6:2 FTS	PFAS by ID	4600		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	4:2 FTS	PFAS by ID	130		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFBS	PFAS by ID	43		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFHpS	PFAS by ID	12		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFPeS	PFAS by ID	42		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFHxS	PFAS by ID	350		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFBA	PFAS by ID	580		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFDA	PFAS by ID	1.2	J	ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFHpA	PFAS by ID	480		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFHxA	PFAS by ID	1400		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFNA	PFAS by ID	16		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFOA	PFAS by ID	350		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFPeA	PFAS by ID	1300		ng/L	47
020	AOPC26-W5-3-070821	Aqueous	PFOS	PFAS by ID	490		ng/L	47

(136 detections)

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-001
Description: AOPC10-WGC2-6-070721 | Matrix: Aqueous
Date Sampled: 07/07/2021 1057 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1427	MMM	07/14/2021 1150	98815
2	SOP SPE	PFAS by ID SOP QSM B-15	1	07/21/2021 1608	MMM	07/20/2021 1145	99449

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	21		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.6	J	3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.2	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	6.8		3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.0	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		116	50-150		89	50-150
13C2_6:2FTS		127	50-150		125	50-150
13C2_8:2FTS		97	50-150		73	50-150
13C2_PFDoA		80	50-150		64	50-150
13C2_PFTeDA		76	50-150		59	50-150
13C3_PFBS		98	50-150		79	50-150
13C3_PFHxS		97	50-150		78	50-150
13C3-HFPO-DA		104	50-150		86	50-150
13C4_PFBA		88	50-150		76	50-150
13C4_PFHpA		91	50-150		76	50-150
13C5_PFHxA		92	50-150		79	50-150
13C5_PFPeA		93	50-150		76	50-150
13C6_PFDA		89	50-150		80	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-001
Description: AOPC10-WGC2-6-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1057
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		89	50-150		66	50-150
13C8_PFOA		99	50-150		80	50-150
13C8_PFOS		91	50-150		66	50-150
13C8_PFOSA		93	50-150		78	50-150
13C9_PFNA		98	50-150		73	50-150
d5-EtFOSAA		91	50-150		56	50-150
d3-MeFOSAA		87	50-150		62	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-002
Description: AOPC10-WGC2-12-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1203
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1437	MMM	07/14/2021 1150	98815

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.9	J	7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.1	J	3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.4		3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.1		3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.7		3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		110	50-150
13C2_6:2FTS		136	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBA		77	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		86	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-002
Description: AOPC10-WGC2-12-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1203
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-003
Description: AOPC10-WGC2-12-070721-FD
Matrix: Aqueous
Date Sampled: 07/07/2021 1203
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1458	MMM	07/14/2021 1150	98815
2	SOP SPE	PFAS by ID SOP QSM B-15	1	07/21/2021 1619	MMM	07/20/2021 1145	99449

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	9.9		7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.0		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.1		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	UQ	4.1	2.1	1.0	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		97	50-150		83	50-150
13C2_6:2FTS		100	50-150		83	50-150
13C2_8:2FTS		92	50-150		58	50-150
13C2_PFDoA		83	50-150	N	30	50-150
13C2_PFTeDA		75	50-150	N	18	50-150
13C3_PFBS		90	50-150		76	50-150
13C3_PFHxS		86	50-150		74	50-150
13C3-HFPO-DA		103	50-150		86	50-150
13C4_PFBA		77	50-150		68	50-150
13C4_PFHpA		89	50-150		69	50-150
13C5_PFHxA		81	50-150		70	50-150
13C5_PFPeA		87	50-150		74	50-150
13C6_PFDA		87	50-150		68	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-003
Description: AOPC10-WGC2-12-070721-FD
Matrix: Aqueous
Date Sampled: 07/07/2021 1203
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		85	50-150	N	48	50-150
13C8_PFOA		95	50-150		77	50-150
13C8_PFOS		89	50-150		69	50-150
13C8_PFOSA		106	50-150	N	48	50-150
13C9_PFNA		105	50-150		73	50-150
d5-EtFOSAA		89	50-150	N	40	50-150
d3-MeFOSAA		89	50-150		50	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-004
Description: AOPC10-WGC2-4-070721 | Matrix: Aqueous
Date Sampled: 07/07/2021 1308 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1530	MMM	07/14/2021 1150	98815

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	19		7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	31		3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.4		3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	25		3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	34	Q	3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.3	J	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	12		3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	27		3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	J	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	17		3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	26		3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	34		3.6	1.8	0.91	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	160	50-150
13C2_6:2FTS		146	50-150
13C2_8:2FTS		133	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA	N	25	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		65	50-150
13C5_PFPeA		69	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		88	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-004
Description: AOPC10-WGC2-4-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1308
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		87	50-150
13C8_PFOSA		104	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-005
Description: AOPC10-WGC2-5-070721 | Matrix: Aqueous
Date Sampled: 07/07/2021 1340 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1551	MMM	07/14/2021 1150	98815
2	SOP SPE	PFAS by ID SOP QSM B-15	1	07/21/2021 1629	MMM	07/20/2021 1145	99449

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.6	J	7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	J	3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4.5		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	6.1		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.1	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	11		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.3	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.3	1.7	0.82	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.4	J	3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		101	50-150		94	50-150
13C2_6:2FTS		128	50-150		130	50-150
13C2_8:2FTS		98	50-150		78	50-150
13C2_PFDoA		89	50-150		76	50-150
13C2_PFTeDA		79	50-150		76	50-150
13C3_PFBS		95	50-150		85	50-150
13C3_PFHxS		95	50-150		84	50-150
13C3-HFPO-DA		89	50-150		97	50-150
13C4_PFBA		82	50-150		71	50-150
13C4_PFHpA		92	50-150		84	50-150
13C5_PFHxA		91	50-150		88	50-150
13C5_PFPeA		93	50-150		87	50-150
13C6_PFDA		85	50-150		93	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-005
Description: AOPC10-WGC2-5-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1340
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		86	50-150		79	50-150
13C8_PFOA		101	50-150		91	50-150
13C8_PFOS		88	50-150		87	50-150
13C8_PFOSA		102	50-150		77	50-150
13C9_PFNA		94	50-150		81	50-150
d5-EtFOSAA		98	50-150		81	50-150
d3-MeFOSAA		97	50-150		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-006
Description: ERB-01-070721 | Matrix: Aqueous
Date Sampled: 07/08/2021 0900 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1602	MMM	07/14/2021 1150	98815
2	SOP SPE	PFAS by ID SOP QSM B-15	1	07/21/2021 1640	MMM	07/20/2021 1145	99449

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		90	50-150		83	50-150
13C2_6:2FTS		136	50-150		90	50-150
13C2_8:2FTS		100	50-150		85	50-150
13C2_PFDoA		81	50-150		82	50-150
13C2_PFTeDA		79	50-150		81	50-150
13C3_PFBS		83	50-150		85	50-150
13C3_PFHxS		85	50-150		85	50-150
13C3-HFPO-DA		94	50-150		100	50-150
13C4_PFBA		87	50-150		92	50-150
13C4_PFHpA		91	50-150		87	50-150
13C5_PFHxA		82	50-150		84	50-150
13C5_PFPeA		86	50-150		85	50-150
13C6_PFDA		82	50-150		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-006
Description: ERB-01-070721			Matrix: Aqueous
Date Sampled: 07/08/2021 0900	Project Name: NASA Ames PFAS		
Date Received: 07/10/2021	Project Number: 1031G667601		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		80	50-150		85	50-150
13C8_PFOA		99	50-150		92	50-150
13C8_PFOS		87	50-150		90	50-150
13C8_PFOSA		90	50-150		77	50-150
13C9_PFNA		98	50-150		85	50-150
d5-EtFOSAA		94	50-150		84	50-150
d3-MeFOSAA		92	50-150		91	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-007
Description: FB-01-070721 | Matrix: Aqueous
Date Sampled: 07/07/2021 1700 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1612	MMM	07/14/2021 1150	98815
2	SOP SPE	PFAS by ID SOP QSM B-15	1	07/21/2021 1712	MMM	07/20/2021 1145	99449

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.5	U	5.0	2.5	1.2	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		107	50-150		83	50-150
13C2_6:2FTS		144	50-150		116	50-150
13C2_8:2FTS		100	50-150		78	50-150
13C2_PFDoA		83	50-150		77	50-150
13C2_PFTeDA		52	50-150		54	50-150
13C3_PFBS		93	50-150		79	50-150
13C3_PFHxS		87	50-150		80	50-150
13C3-HFPO-DA		93	50-150		93	50-150
13C4_PFBA		89	50-150		85	50-150
13C4_PFHpA		86	50-150		81	50-150
13C5_PFHxA		85	50-150		77	50-150
13C5_PFPeA		92	50-150		83	50-150
13C6_PFDA		87	50-150		87	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-007
Description: FB-01-070721			Matrix: Aqueous
Date Sampled: 07/07/2021 1700	Project Name: NASA Ames PFAS		
Date Received: 07/10/2021	Project Number: 1031G667601		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		82	50-150		76	50-150
13C8_PFOA		101	50-150		85	50-150
13C8_PFOS		85	50-150		87	50-150
13C8_PFOSA		98	50-150		74	50-150
13C9_PFNA		89	50-150		76	50-150
d5-EtFOSAA		95	50-150		76	50-150
d3-MeFOSAA		92	50-150		81	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-008
Description: AOPC17-W3-20-070721 | Matrix: Aqueous
Date Sampled: 07/07/2021 1445 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1658	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	14		8.4	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	12		4.2	2.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.1	J	4.2	2.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	3.8	J	4.2	2.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	11		4.2	2.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	130		4.2	2.1	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	19		4.2	2.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	10		4.2	2.1	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	12		4.2	2.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.5	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	160	B	4.2	2.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.8		4.2	2.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	99		4.2	2.1	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		105	50-150
13C2_6:2FTS		112	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		86	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		104	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		82	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-008
Description: AOPC17-W3-20-070721			Matrix: Aqueous
Date Sampled: 07/07/2021 1445		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-009
Description: AOPC17-W3-1-070721 | Matrix: Aqueous
Date Sampled: 07/07/2021 1655 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1708	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	8.3		7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.0		3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.1	J	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.8		3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	56		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	15		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.1	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.0	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	44	B	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	39		3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		106	50-150
13C2_6:2FTS		116	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		86	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-009
Description: AOPC17-W3-1-070721			Matrix: Aqueous
Date Sampled: 07/07/2021 1655		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		89	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		80	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-010
Description: AOPC17-W3-8-070821 | Matrix: Aqueous
Date Sampled: 07/08/2021 1035 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1719	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.1	J	7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	37		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	5.7		3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	29		3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	190		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	96		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.2		3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.4	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	48	B	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	12		3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	150		3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		107	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		84	50-150
13C7_PFUdA		86	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-010
Description: AOPC17-W3-8-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1035
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-011
Description: AOPC16-WU5-9-070821 | Matrix: Aqueous
Date Sampled: 07/08/2021 1345 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1730	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	8.4	J	13	6.5	3.3	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.6		6.5	3.3	1.6	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	J	6.5	3.3	1.6	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	40		6.5	3.3	1.6	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	16		6.5	3.3	1.6	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	3.5	J	6.5	3.3	1.6	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	6.4	J	6.5	3.3	1.6	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	44	B	6.5	3.3	1.6	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	6.6		6.5	3.3	1.6	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	47		6.5	3.3	1.6	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		71	50-150
13C2_8:2FTS		61	50-150
13C2_PFDoA		56	50-150
13C2_PFTeDA		52	50-150
13C3_PFBS		60	50-150
13C3_PFHxS		61	50-150
13C3-HFPO-DA		61	50-150
13C4_PFBA		61	50-150
13C4_PFHpA		61	50-150
13C5_PFHxA		60	50-150
13C5_PFPeA		60	50-150
13C6_PFDA		53	50-150
13C7_PFUdA		57	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-011
Description: AOPC16-WU5-9-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1345
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		61	50-150
13C8_PFOS		53	50-150
13C8_PFOSA		54	50-150
13C9_PFNA		60	50-150
d5-EtFOSAA		58	50-150
d3-MeFOSAA		59	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-012
Description: FB-02-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1500
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1812	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		100	50-150
13C2_6:2FTS		134	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		86	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-012
Description: FB-02-070821			Matrix: Aqueous
Date Sampled: 07/08/2021 1500		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-013
Description: AOPC9,16-W2-16-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1300
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1823	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	54		7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	UQ	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	67		3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	15		3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	J	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	68		3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	500		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	46		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	39		3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	150		3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	5.9		3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	230	B	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	83		3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	500		3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	168	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-013
Description: AOPC9,16-W2-16-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1300
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-014
Description: AOPC8-W1-20-070921 | Matrix: Aqueous
Date Sampled: 07/09/2021 1307 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1833	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.0	J	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.4	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.4		3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.8	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	15		3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	110	BS	3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.9		3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	UQ	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		95	50-150
13C2_6:2FTS		71	50-150
13C2_8:2FTS		65	50-150
13C2_PFDoA		60	50-150
13C2_PFTeDA	N	42	50-150
13C3_PFBS		75	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		74	50-150
13C4_PFBA		66	50-150
13C4_PFHpA		71	50-150
13C5_PFHxA		75	50-150
13C5_PFPeA		74	50-150
13C6_PFDA		63	50-150
13C7_PFUdA		61	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-014
Description: AOPC8-W1-20-070921			Matrix: Aqueous
Date Sampled: 07/09/2021 1307		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		71	50-150
13C8_PFOS		60	50-150
13C8_PFOSA		62	50-150
13C9_PFNA		67	50-150
d5-EtFOSAA		55	50-150
d3-MeFOSAA		59	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-015
Description: AOPC8-W1-19-070921 | Matrix: Aqueous
Date Sampled: 07/09/2021 1400 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1905	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	160		7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.0	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		113	50-150
13C2_6:2FTS		97	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		78	50-150
13C7_PFUdA		76	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-015
Description: AOPC8-W1-19-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1400
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	50-150
13C8_PFOS		77	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		76	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-016
Description: AOPC8-W1-19-070921-FD | Matrix: Aqueous
Date Sampled: 07/09/2021 1405 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1916	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	160		7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.92	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.3	BJ	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		108	50-150
13C2_6:2FTS		101	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		93	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		77	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-016
Description: AOPC8-W1-19-070921-FD
Matrix: Aqueous
Date Sampled: 07/09/2021 1405
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		80	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-017
Description: AOPC8-W1-1R-070921 | Matrix: Aqueous
Date Sampled: 07/09/2021 1320 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1926	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	110		6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.7	J	3.4	1.7	0.84	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		129	50-150
13C2_6:2FTS		109	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		67	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		79	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-017
Description: AOPC8-W1-1R-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1320
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		76	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-018
Description: AOPC8-W1-14-070921 | Matrix: Aqueous
Date Sampled: 07/09/2021 1550 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1937	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.9		3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.4	J	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	6.3		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	10		3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.4	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	26		3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	6.5	B	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	13		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.8	J	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		137	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		69	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		68	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		80	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-018
Description: AOPC8-W1-14-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1550
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-019
Description: AOPC8-W1-5-070921 | Matrix: Aqueous
Date Sampled: 07/09/2021 1520 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1948	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	79		7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.4	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.7		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.3	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.4	BJ	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		137	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		69	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		61	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		77	50-150
13C6_PFDA		70	50-150
13C7_PFUdA		74	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-019
Description: AOPC8-W1-5-070921			Matrix: Aqueous
Date Sampled: 07/09/2021 1520		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		77	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		71	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG10017-020
Description: AOPC26-W5-3-070821 | Matrix: Aqueous
Date Sampled: 07/08/2021 1510 | Project Name: NASA Ames PFAS
Date Received: 07/10/2021 | Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/20/2021 1551	MMM	07/19/2021 1250	99310
2	SOP SPE	PFAS by ID SOP QSM B-15	10	07/22/2021 1856	MMM	07/19/2021 1250	99310

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	37		7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4600		75	38	19	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	130		7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	43		3.7	1.9	0.93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	12		3.7	1.9	0.93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	42		3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	350		3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	580		3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.2	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	480		3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1400		37	19	9.3	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	16		3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	350		3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1300		37	19	9.3	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	490		3.7	1.9	0.93	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		100	50-150		112	50-150
13C2_6:2FTS		120	50-150		111	50-150
13C2_8:2FTS		102	50-150		122	50-150
13C2_PFDoA		77	50-150		94	50-150
13C2_PFTeDA		56	50-150		86	50-150
13C3_PFBS		88	50-150		94	50-150
13C3_PFHxS		81	50-150		94	50-150
13C3-HFPO-DA		83	50-150		116	50-150
13C4_PFBA		96	50-150		101	50-150
13C4_PFHpA		87	50-150		84	50-150
13C5_PFHxA		83	50-150		101	50-150
13C5_PFPeA		86	50-150		93	50-150
13C6_PFDA		86	50-150		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-020
Description: AOPC26-W5-3-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1510
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		87	50-150		93	50-150
13C8_PFOA		82	50-150		87	50-150
13C8_PFOS		83	50-150		97	50-150
13C8_PFOSA		85	50-150		109	50-150
13C9_PFNA		89	50-150		95	50-150
d5-EtFOSAA		94	50-150		113	50-150
d3-MeFOSAA		84	50-150		111	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-021
Description: FB-03-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1540
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1958	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		97	50-150
13C2_6:2FTS		124	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		78	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-021
Description: FB-03-070921			Matrix: Aqueous
Date Sampled: 07/09/2021 1540		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ98815-001
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS	N	153	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		66	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		108	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ98815-001
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		115	50-150
13C8_PFOS		106	50-150
13C8_PFOSA		108	50-150
13C9_PFNA		102	50-150
d5-EtFOSAA		108	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ98815-002
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	103	70-150	07/18/2021 1846
11Cl-PF3OUdS	15	14		1	90	70-150	07/18/2021 1846
8:2 FTS	15	16		1	106	67-138	07/18/2021 1846
6:2 FTS	15	14		1	90	64-140	07/18/2021 1846
4:2 FTS	15	14		1	92	63-143	07/18/2021 1846
GenX	32	31		1	97	70-150	07/18/2021 1846
ADONA	15	17		1	111	70-150	07/18/2021 1846
EtFOSAA	16	16		1	102	61-135	07/18/2021 1846
MeFOSAA	16	15		1	94	65-136	07/18/2021 1846
PFBS	14	14		1	98	72-130	07/18/2021 1846
PFDS	15	14		1	92	53-142	07/18/2021 1846
PFHpS	15	17		1	114	69-134	07/18/2021 1846
PFNS	15	19		1	121	69-127	07/18/2021 1846
PFOSA	16	15		1	96	67-137	07/18/2021 1846
PFPeS	15	17		1	111	71-127	07/18/2021 1846
PFHxS	15	17		1	116	68-131	07/18/2021 1846
PFBA	16	16		1	102	73-129	07/18/2021 1846
PFDA	16	18		1	110	71-129	07/18/2021 1846
PFDoA	16	16		1	101	72-134	07/18/2021 1846
PFHpA	16	17		1	104	72-130	07/18/2021 1846
PFHxA	16	18		1	111	72-129	07/18/2021 1846
PFNA	16	17		1	108	69-130	07/18/2021 1846
PFOA	16	17		1	105	71-133	07/18/2021 1846
PFPeA	16	16		1	98	72-129	07/18/2021 1846
PFTeDA	16	16		1	99	71-132	07/18/2021 1846
PFTrDA	16	11		1	67	65-144	07/18/2021 1846
PFUdA	16	15		1	96	69-133	07/18/2021 1846
PFOS	15	18		1	121	65-140	07/18/2021 1846

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	50-150
13C2_6:2FTS		148	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA	N	38	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		108	50-150
13C4_PFBA		101	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ98815-002
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	50-150
13C7_PFUdA		98	50-150
13C8_PFOA		102	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		110	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG10017-002MS
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	14		1	105	70-150	07/15/2021 1448
11Cl-PF3OUdS	ND	13	11		1	86	70-150	07/15/2021 1448
8:2 FTS	ND	13	14		1	102	67-138	07/15/2021 1448
6:2 FTS	6.9	13	22		1	110	64-140	07/15/2021 1448
4:2 FTS	ND	13	14		1	106	63-143	07/15/2021 1448
GenX	ND	28	34		1	122	70-150	07/15/2021 1448
ADONA	ND	13	15		1	111	70-150	07/15/2021 1448
EtFOSAA	ND	14	14		1	97	61-135	07/15/2021 1448
MeFOSAA	ND	14	14		1	98	65-136	07/15/2021 1448
PFBS	1.1	12	14		1	104	72-130	07/15/2021 1448
PFDS	ND	14	13		1	93	53-142	07/15/2021 1448
PFHpS	ND	13	13		1	99	69-134	07/15/2021 1448
PFNS	ND	13	15		1	109	69-127	07/15/2021 1448
PFOSA	ND	14	14		1	100	67-137	07/15/2021 1448
PFPeS	ND	13	14		1	108	71-127	07/15/2021 1448
PFHxS	5.4	13	19		1	104	68-131	07/15/2021 1448
PFBA	4.1	14	18		1	102	73-129	07/15/2021 1448
PFDA	ND	14	16		1	116	71-129	07/15/2021 1448
PFDoA	ND	14	14		1	98	72-134	07/15/2021 1448
PFHpA	ND	14	13		1	94	72-130	07/15/2021 1448
PFHxA	ND	14	14		1	103	72-129	07/15/2021 1448
PFNA	ND	14	13		1	91	69-130	07/15/2021 1448
PFOA	3.7	14	17		1	97	71-133	07/15/2021 1448
PFPeA	ND	14	15		1	106	72-129	07/15/2021 1448
PFTeDA	ND	14	14		1	99	71-132	07/15/2021 1448
PFTrDA	ND	14	12		1	88	65-144	07/15/2021 1448
PFUdA	ND	14	16		1	112	69-133	07/15/2021 1448
PFOS	ND	13	14		1	104	65-140	07/15/2021 1448

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		94	50-150
13C2_6:2FTS		101	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		80	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		94	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG10017-002MS
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	50-150
13C7_PFUdA		82	50-150
13C8_PFOA		100	50-150
13C8_PFOS		92	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		104	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG10017-004DU
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	07/15/2021 1541
11Cl-PF3OUdS	ND	ND		1	0.00	20	07/15/2021 1541
8:2 FTS	ND	ND		1	0.00	20	07/15/2021 1541
6:2 FTS	19	23		1	15	20	07/15/2021 1541
4:2 FTS	ND	ND		1	0.00	20	07/15/2021 1541
GenX	ND	ND		1	0.00	20	07/15/2021 1541
ADONA	ND	ND		1	0.00	20	07/15/2021 1541
EtFOSAA	ND	ND		1	0.00	20	07/15/2021 1541
MeFOSAA	ND	ND		1	0.00	20	07/15/2021 1541
PFBS	31	29		1	5.2	20	07/15/2021 1541
PFDS	ND	ND		1	0.00	20	07/15/2021 1541
PFHpS	ND	ND		1	0.00	20	07/15/2021 1541
PFNS	ND	ND		1	0.00	20	07/15/2021 1541
PFOSA	ND	ND		1	0.00	20	07/15/2021 1541
PFPeS	4.4	4.5		1	2.1	20	07/15/2021 1541
PFHxS	25	26		1	1.3	20	07/15/2021 1541
PFBA	34	34		1	0.67	20	07/15/2021 1541
PFDA	1.3	1.1	J	1	18	20	07/15/2021 1541
PFDoA	ND	ND		1	0.00	20	07/15/2021 1541
PFHpA	12	13		1	4.4	20	07/15/2021 1541
PFHxA	27	27		1	2.8	20	07/15/2021 1541
PFNA	2.1	2.2	J	1	6.8	20	07/15/2021 1541
PFOA	17	17		1	1.2	20	07/15/2021 1541
PFPeA	26	24		1	7.9	20	07/15/2021 1541
PFTeDA	ND	ND		1	0.00	20	07/15/2021 1541
PFTrDA	ND	ND		1	0.00	20	07/15/2021 1541
PFUdA	ND	ND		1	0.00	20	07/15/2021 1541
PFOS	34	35		1	4.3	20	07/15/2021 1541

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	174	50-150
13C2_6:2FTS	N	186	50-150
13C2_8:2FTS		142	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA	N	30	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		68	50-150
13C5_PFPeA		74	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG10017-004DU
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		111	50-150
13C7_PFUdA		101	50-150
13C8_PFOA		104	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		120	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		126	50-150
d3-MeFOSAA		114	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99118-001
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFOA	1.3	J	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	50-150
13C2_6:2FTS		111	50-150
13C2_8:2FTS		102	50-150
13C2_PFDoA		92	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		100	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		95	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99118-001
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		103	50-150
13C8_PFOS		92	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99118-002
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	102	70-150	07/17/2021 1543
11Cl-PF3OUdS	15	17		1	110	70-150	07/17/2021 1543
8:2 FTS	15	16		1	101	67-138	07/17/2021 1543
6:2 FTS	15	12		1	82	64-140	07/17/2021 1543
4:2 FTS	15	14		1	96	63-143	07/17/2021 1543
GenX	32	35		1	109	70-150	07/17/2021 1543
ADONA	15	16		1	109	70-150	07/17/2021 1543
EtFOSAA	16	18		1	114	61-135	07/17/2021 1543
MeFOSAA	16	15		1	91	65-136	07/17/2021 1543
PFBS	14	15		1	105	72-130	07/17/2021 1543
PFDS	15	14		1	91	53-142	07/17/2021 1543
PFHpS	15	17		1	113	69-134	07/17/2021 1543
PFNS	15	17		1	112	69-127	07/17/2021 1543
PFOSA	16	16		1	103	67-137	07/17/2021 1543
PFPeS	15	16		1	109	71-127	07/17/2021 1543
PFHxS	15	15		1	106	68-131	07/17/2021 1543
PFBA	16	17		1	107	73-129	07/17/2021 1543
PFDA	16	18		1	113	71-129	07/17/2021 1543
PFDoA	16	18		1	115	72-134	07/17/2021 1543
PFHpA	16	18		1	113	72-130	07/17/2021 1543
PFHxA	16	16		1	97	72-129	07/17/2021 1543
PFNA	16	17		1	104	69-130	07/17/2021 1543
PFOA	16	18		1	110	71-133	07/17/2021 1543
PFPeA	16	18		1	110	72-129	07/17/2021 1543
PFTeDA	16	17		1	107	71-132	07/17/2021 1543
PFTrDA	16	18		1	114	65-144	07/17/2021 1543
PFUdA	16	18		1	109	69-133	07/17/2021 1543
PFOS	15	15		1	104	65-140	07/17/2021 1543

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		105	50-150
13C2_6:2FTS		118	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		97	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99118-002
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		102	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG10017-014MS
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	12		1	95	70-150	07/17/2021 1844
11Cl-PF3OUdS	ND	13	12		1	89	70-150	07/17/2021 1844
8:2 FTS	ND	13	16		1	122	67-138	07/17/2021 1844
6:2 FTS	6.0	13	21		1	113	64-140	07/17/2021 1844
4:2 FTS	ND	13	12		1	90	63-143	07/17/2021 1844
GenX	ND	28	28		1	101	70-150	07/17/2021 1844
ADONA	ND	13	13		1	100	70-150	07/17/2021 1844
EtFOSAA	ND	14	14		1	99	61-135	07/17/2021 1844
MeFOSAA	ND	14	12		1	85	65-136	07/17/2021 1844
PFBS	ND	12	13		1	103	72-130	07/17/2021 1844
PFDS	ND	14	12		1	92	53-142	07/17/2021 1844
PFHpS	ND	13	13		1	100	69-134	07/17/2021 1844
PFNS	ND	14	14		1	102	69-127	07/17/2021 1844
PFOSA	ND	14	14		1	102	67-137	07/17/2021 1844
PFPeS	ND	13	13		1	100	71-127	07/17/2021 1844
PFHxS	1.4	13	15		1	104	68-131	07/17/2021 1844
PFBA	4.4	14	18		1	98	73-129	07/17/2021 1844
PFDA	ND	14	14		1	103	71-129	07/17/2021 1844
PFDoA	ND	14	15		1	109	72-134	07/17/2021 1844
PFHpA	2.8	14	16		1	96	72-130	07/17/2021 1844
PFHxA	15	14	30		1	105	72-129	07/17/2021 1844
PFNA	ND	14	14		1	101	69-130	07/17/2021 1844
PFOA	110	14	130		1	113	71-133	07/17/2021 1844
PFPeA	4.9	14	20		1	106	72-129	07/17/2021 1844
PFTeDA	ND	14	15		1	104	71-132	07/17/2021 1844
PFTrDA	ND	14	14		1	101	65-144	07/17/2021 1844
PFUdA	ND	14	15		1	105	69-133	07/17/2021 1844
PFOS	ND	13	15		1	113	65-140	07/17/2021 1844

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		121	50-150
13C2_6:2FTS		91	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		68	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		87	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG10017-014MS
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		78	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		87	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		71	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG10017-014MD
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	13	13		1	94	0.77	70-150	30	07/17/2021 1854
11Cl-PF3OUdS	ND	13	13		1	93	5.6	70-150	30	07/17/2021 1854
8:2 FTS	ND	14	14		1	100	18	67-138	30	07/17/2021 1854
6:2 FTS	6.0	14	21		1	113	0.75	64-140	30	07/17/2021 1854
4:2 FTS	ND	13	14		1	104	16	63-143	30	07/17/2021 1854
GenX	ND	29	30		1	103	3.6	70-150	30	07/17/2021 1854
ADONA	ND	13	14		1	102	3.3	70-150	30	07/17/2021 1854
EtFOSAA	ND	14	15		1	102	4.3	61-135	30	07/17/2021 1854
MeFOSAA	ND	14	16		1	113	29	65-136	30	07/17/2021 1854
PFBS	ND	13	14		1	113	11	72-130	30	07/17/2021 1854
PFDS	ND	14	13		1	95	4.8	53-142	30	07/17/2021 1854
PFHpS	ND	14	15		1	109	10	69-134	30	07/17/2021 1854
PFNS	ND	14	13		1	97	3.5	69-127	30	07/17/2021 1854
PFOSA	ND	14	15		1	106	4.9	67-137	30	07/17/2021 1854
PFPeS	ND	13	15		1	113	14	71-127	30	07/17/2021 1854
PFHxS	1.4	13	15		1	102	0.43	68-131	30	07/17/2021 1854
PFBA	4.4	14	19		1	105	6.4	73-129	30	07/17/2021 1854
PFDA	ND	14	16		1	113	11	71-129	30	07/17/2021 1854
PFDoA	ND	14	16		1	111	3.4	72-134	30	07/17/2021 1854
PFHpA	2.8	14	17		1	101	4.8	72-130	30	07/17/2021 1854
PFHxA	15	14	32		1	116	5.6	72-129	30	07/17/2021 1854
PFNA	ND	14	16		1	109	9.8	69-130	30	07/17/2021 1854
PFOA	110	14	120	N	1	41	8.4	71-133	30	07/17/2021 1854
PFPeA	4.9	14	20		1	105	0.49	72-129	30	07/17/2021 1854
PFTeDA	ND	14	15		1	107	3.6	71-132	30	07/17/2021 1854
PFTrDA	ND	14	15		1	108	8.8	65-144	30	07/17/2021 1854
PFUdA	ND	14	16		1	110	6.0	69-133	30	07/17/2021 1854
PFOS	ND	13	13		1	101	9.6	65-140	30	07/17/2021 1854

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		107	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG10017-014MD
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		76	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		90	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		80	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		73	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99310-001
Batch: 99310
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/19/2021 1250

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		89	50-150
13C2_6:2FTS		128	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		85	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99310-001
Batch: 99310
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/19/2021 1250

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		99	50-150
13C8_PFOS		93	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99310-002
Batch: 99310
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/19/2021 1250

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	109	70-150	07/20/2021 1519
11Cl-PF3OUdS	15	15		1	99	70-150	07/20/2021 1519
8:2 FTS	15	16		1	106	67-138	07/20/2021 1519
6:2 FTS	15	14		1	94	64-140	07/20/2021 1519
4:2 FTS	15	15		1	99	63-143	07/20/2021 1519
GenX	32	39		1	122	70-150	07/20/2021 1519
ADONA	15	17		1	113	70-150	07/20/2021 1519
EtFOSAA	16	17		1	104	61-135	07/20/2021 1519
MeFOSAA	16	17		1	106	65-136	07/20/2021 1519
PFBS	14	15		1	108	72-130	07/20/2021 1519
PFDS	15	17		1	107	53-142	07/20/2021 1519
PFHpS	15	15		1	100	69-134	07/20/2021 1519
PFNS	15	17		1	109	69-127	07/20/2021 1519
PFOSA	16	17		1	105	67-137	07/20/2021 1519
PFPeS	15	17		1	113	71-127	07/20/2021 1519
PFHxS	15	14		1	99	68-131	07/20/2021 1519
PFBA	16	17		1	109	73-129	07/20/2021 1519
PFDA	16	17		1	105	71-129	07/20/2021 1519
PFDoA	16	19		1	116	72-134	07/20/2021 1519
PFHpA	16	17		1	106	72-130	07/20/2021 1519
PFHxA	16	18		1	113	72-129	07/20/2021 1519
PFNA	16	18		1	115	69-130	07/20/2021 1519
PFOA	16	17		1	105	71-133	07/20/2021 1519
PFPeA	16	18		1	112	72-129	07/20/2021 1519
PFTeDA	16	18		1	110	71-132	07/20/2021 1519
PFTrDA	16	17		1	105	65-144	07/20/2021 1519
PFUdA	16	17		1	106	69-133	07/20/2021 1519
PFOS	15	19		1	125	65-140	07/20/2021 1519

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		124	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		101	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99310-002
Batch: 99310
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/19/2021 1250

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		96	50-150
13C8_PFOS		87	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99449-001
Batch: 99449
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/20/2021 1145

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1319

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		112	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		92	50-150
13C2_PFTeDA		95	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		106	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		94	50-150
13C8_PFOS		100	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99449-002
Batch: 99449
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/20/2021 1145

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
PFTeDA	16	18		1	115	71-132	07/21/2021 1329

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		98	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCSD

Sample ID: WQ99449-003
Batch: 99449
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/20/2021 1145

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
PFTeDA	16	17		1	104	10	71-132	30	07/21/2021 1340

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		98	50-150
13C2_6:2FTS	N	157	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		97	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122948

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510)302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves, Ryan Melendez, Elain McDonald		Bar Code: WG10017 K582
Project Name: NASA Ames PFAS			
Project No.: 10316667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G-Grab C-Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Field Filtered	PFAS (QSM B-15)									Remarks / Cont.
AOPC10-WGC2-6-070721	7/7/21	1057	G	X			2							X									
AOPC10-WGC2-12-070721	7/7/21	1203	G	X			2							X									
AOPC10-WGC2-12-070721-FD	7/7/21	1203	G	X			2							X									
AOPC10-WGC2-4-070721	7/7/21	1308	G	X			2							X									
AOPC10-WGC2-5-070721	7/7/21	1340	G	X			2							X									
~~AOPC10-W3-20-070721~~	~~7/7/21~~	~~1445~~	~~G~~	~~X~~			~~2~~							X	BAJD 7/7/21								
~~AOPC10-W3-1-070721~~	~~7/7/21~~		~~G~~	~~X~~			~~2~~							X	MJD 7/7/21								
~~AOPC10-W3-8-070721~~	~~7/7/21~~		~~G~~	~~X~~			~~2~~							X	MJD 7/7/21								
ERB-01-070721	7/8/21	0900	G	X			2							X									
FB-01-070721	7/7/21	1700	G	X			2							X									

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)	Sample Disposal ☐ Return to Client ☐ Disposal by Lab	Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: E. McDonald [signature]	7/9/21		1. Received by: FedEx		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/10/21	940	4. Laboratory received by: [signature]	7/10/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 3.8 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122968

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510)302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 2 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves, Ryan Melendez, Elena McDonald [signature]		List of Pre-Code: WG10017
Project Name: NASA Ames PFAS			
Project No.: 1031G667601	P.O. No.		KESZ

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Sub C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 KI	Field Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC17-W3-20-070721	7/7/21	1445	G	X			2							X	
AOPC17-W3-1-070721	7/7/21	1655	G	X			2							X	
AOPC17-W3-8-070821	7/8/21	1035	G	X			2							X	
AOPC16-WU5-9-070821	7/8/21	1345	G	X			2							X	
FB-02-070821	7/8/21	1500	G	X			2							X	
AOPC9,16-W2-16-070821	7/8/21	1300	G	X			2							X	
AOPC8-W1-20-070921	7/9/21	1307	G	X			6							X	MS/MSD
AOPC8-W1-19-070921	7/9/21	1400	G	X			2							X	
AOPC8-W1-19-070921-FD	7/9/21	1405	G	X			2							X	
AOPC8-W1-1R-070921	7/9/21	1320	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)	Sample Disposal ☐ Return to Client ☐ Disposal by Lab	Possible Hazard Identification ☐ Non-Hazard ☐ Rammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: E. McDonald TT [signature]	7/9/21		1. Received by: FedEx		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/10/21	940	4. Laboratory received by: [signature]	7/10/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No ice Pack
Receipt Temp. 3.8 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122953

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 3 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves, Ryan Melendez, Elgin McDonald		WG10017
Project Name: NASA Ames PFAS			KES2
Project No.: 10316667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Dioxin	H2SO4	HNO3	HCl	NaOH	5035 KV	Pein Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC8-W1-14-070921	7/9/21	1550		X			2							X	
AOPC8-W1-5-070921	7/9/21	1520		X			2							X	
AOPC26-W5-3-070821	7/8/21	1510		X			2							X	
FB-03-070921	7/9/21	1540		X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)	Sample Disposal ☐ Return to Client ☐ Disposal by Lab	Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: E. McDonald TT [signature]	7/9/21		1. Received by: Fed Ex		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: [signature]	7/10/21	940	4. Laboratory received by: [signature]	7/10/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 3.8 °C
Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020

Sample Receipt Checklist (SRC)

Client: TETRA TECH Cooler Inspected by/date: JSM / 07/10/2021 Lot #: WG10017

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.8 / 3.8 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote # NA

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JSM Date: 07/10/2021

Comments:

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dahlquist

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Lot Number:**WG20002**

Date Completed:07/30/2021

07/30/2021 2:25 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Case Narrative
Tetra Tech
Lot Number: WG20002

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

The continuing calibration verification (CCV) associated with sample WG20002-029 for analyte: 8:2 FTS recovered above the upper control limit. The sample(s) associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

Surrogate recovery for the following sample(s) was outside the upper control limit: WG20002-007. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

The MS/MSD associated with samples WG20002-019, WG20002-020 had multiple analytes recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample Summary

Tetra Tech

Lot Number: WG20002

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC7-SB01-0-0.5	Solid	07/13/2021 1000	07/20/2021
002	AOPC7-SB01-0.5-2	Solid	07/13/2021 1005	07/20/2021
003	AOPC7-SB02-0-0.5	Solid	07/13/2021 1030	07/20/2021
004	AOPC7-SB02-0.5-2	Solid	07/13/2021 1035	07/20/2021
005	AOPC1-SB01-0-0.5	Solid	07/13/2021 1100	07/20/2021
006	AOPC1-SB01-0.5-2	Solid	07/13/2021 1105	07/20/2021
007	AOPC1-SB02-0-0.5	Solid	07/13/2021 1120	07/20/2021
008	AOPC1-SB02-0.5-2	Solid	07/13/2021 1125	07/20/2021
009	AOPC1-SB03-0-0.5	Solid	07/13/2021 1140	07/20/2021
010	AOPC1-SB03-0.5-2	Solid	07/13/2021 1145	07/20/2021
011	AOPC1-SB04-0-0.5	Solid	07/13/2021 1200	07/20/2021
012	AOPC1-SB04-0.5-2	Solid	07/13/2021 1205	07/20/2021
013	AOPC6-SB01-0-0.5	Solid	07/13/2021 1320	07/20/2021
014	AOPC6-SB01-0.5-2	Solid	07/13/2021 1325	07/20/2021
015	AOPC2-SB01-0-0.5	Solid	07/13/2021 1430	07/20/2021
016	AOPC2-SB01-0.5-2	Solid	07/13/2021 1435	07/20/2021
017	AOPC2-SB02-0-0.5	Solid	07/13/2021 1445	07/20/2021
018	AOPC2-SB02-0.5-2	Solid	07/13/2021 1450	07/20/2021
019	AOPC2-SB03-0-0.5	Solid	07/13/2021 1500	07/20/2021
020	AOPC2-SB03-0.5-2	Solid	07/13/2021 1505	07/20/2021
021	AOPC2-SB04-0-0.5	Solid	07/13/2021 1510	07/20/2021
022	AOPC2-SB04-0.5-2	Solid	07/13/2021 1515	07/20/2021
023	AOPC2-SB05-0-0.5	Solid	07/13/2021 1520	07/20/2021
024	AOPC2-SB05-0.5-2	Solid	07/13/2021 1525	07/20/2021
025	AOPC2-SB06-0-0.5	Solid	07/13/2021 1530	07/20/2021
026	AOPC2-SB06-0.5-2	Solid	07/13/2021 1535	07/20/2021
027	AOPC2-SB07-0-0.5	Solid	07/13/2021 1540	07/20/2021
028	AOPC2-SB07-0.5-2	Solid	07/13/2021 1545	07/20/2021
029	ERB-071321-S	Aqueous	07/13/2021 1550	07/20/2021

(29 samples)

Detection Summary

Tetra Tech

Lot Number: WG20002

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	AOPC7-SB01-0-0.5	Solid	PFDS	PFAS by ID	0.56	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFHpS	PFAS by ID	0.39	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFNS	PFAS by ID	0.97	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFOSA	PFAS by ID	0.62	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFPeS	PFAS by ID	0.35	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFHxS	PFAS by ID	5.6		ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFBA	PFAS by ID	0.50	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFDA	PFAS by ID	0.27	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFHpA	PFAS by ID	0.58	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFHxA	PFAS by ID	0.87	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFNA	PFAS by ID	0.39	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFOA	PFAS by ID	1.4		ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFPeA	PFAS by ID	1.4		ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFUdA	PFAS by ID	0.63	J	ug/kg	10
001	AOPC7-SB01-0-0.5	Solid	PFOS	PFAS by ID	110		ug/kg	10
002	AOPC7-SB01-0.5-2	Solid	PFHpS	PFAS by ID	0.39	J	ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFNS	PFAS by ID	0.32	J	ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFOSA	PFAS by ID	0.55	J	ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFPeS	PFAS by ID	0.34	J	ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFHxS	PFAS by ID	4.8		ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFBA	PFAS by ID	0.47	J	ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFDA	PFAS by ID	0.47	J	ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFHpA	PFAS by ID	0.60	J	ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFHxA	PFAS by ID	0.81	J	ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFNA	PFAS by ID	0.72	J	ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFOA	PFAS by ID	1.1		ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFPeA	PFAS by ID	1.1		ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFUdA	PFAS by ID	0.26	J	ug/kg	12
002	AOPC7-SB01-0.5-2	Solid	PFOS	PFAS by ID	140		ug/kg	12
003	AOPC7-SB02-0-0.5	Solid	8:2 FTS	PFAS by ID	0.78	J	ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	6:2 FTS	PFAS by ID	1.3	J	ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFBS	PFAS by ID	0.55	J	ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFDS	PFAS by ID	5.1		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFHpS	PFAS by ID	1.4		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFNS	PFAS by ID	4.2		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFOSA	PFAS by ID	4.6		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFPeS	PFAS by ID	1.4		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFHxS	PFAS by ID	23		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFBA	PFAS by ID	3.8		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFDA	PFAS by ID	0.95	J	ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFHpA	PFAS by ID	11		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFHxA	PFAS by ID	12		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFNA	PFAS by ID	2.0		ug/kg	14

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
003	AOPC7-SB02-0-0.5	Solid	PFOA	PFAS by ID	3.0		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFPeA	PFAS by ID	31		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFUdA	PFAS by ID	1.4		ug/kg	14
003	AOPC7-SB02-0-0.5	Solid	PFOS	PFAS by ID	300		ug/kg	14
004	AOPC7-SB02-0.5-2	Solid	8:2 FTS	PFAS by ID	0.73	J	ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFBS	PFAS by ID	0.41	J	ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFDS	PFAS by ID	2.4		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFHpS	PFAS by ID	3.0		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFNS	PFAS by ID	4.4		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFOSA	PFAS by ID	24		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFPeS	PFAS by ID	0.70	J	ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFHxS	PFAS by ID	21		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFBA	PFAS by ID	0.92	J	ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFDA	PFAS by ID	2.4		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFHpA	PFAS by ID	2.4		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFHxA	PFAS by ID	4.8		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFNA	PFAS by ID	2.6		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFOA	PFAS by ID	4.2		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFPeA	PFAS by ID	7.8		ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFUdA	PFAS by ID	0.52	J	ug/kg	16
004	AOPC7-SB02-0.5-2	Solid	PFOS	PFAS by ID	1500		ug/kg	16
005	AOPC1-SB01-0-0.5	Solid	PFBS	PFAS by ID	0.19	J	ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFHpS	PFAS by ID	0.39	J	ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFNS	PFAS by ID	0.34	J	ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFOSA	PFAS by ID	1.4		ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFPeS	PFAS by ID	0.24	J	ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFHxS	PFAS by ID	7.8		ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFBA	PFAS by ID	0.48	J	ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFDA	PFAS by ID	0.81	J	ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFHpA	PFAS by ID	0.36	J	ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFHxA	PFAS by ID	1.0		ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFNA	PFAS by ID	0.29	J	ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFOA	PFAS by ID	7.0		ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFPeA	PFAS by ID	0.43	J	ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFUdA	PFAS by ID	0.25	J	ug/kg	18
005	AOPC1-SB01-0-0.5	Solid	PFOS	PFAS by ID	61		ug/kg	18
006	AOPC1-SB01-0.5-2	Solid	PFBS	PFAS by ID	0.31	J	ug/kg	20
006	AOPC1-SB01-0.5-2	Solid	PFHpS	PFAS by ID	1.1		ug/kg	20
006	AOPC1-SB01-0.5-2	Solid	PFPeS	PFAS by ID	0.54	J	ug/kg	20
006	AOPC1-SB01-0.5-2	Solid	PFHxS	PFAS by ID	22		ug/kg	20
006	AOPC1-SB01-0.5-2	Solid	PFBA	PFAS by ID	0.59	J	ug/kg	20
006	AOPC1-SB01-0.5-2	Solid	PFHpA	PFAS by ID	0.36	J	ug/kg	20
006	AOPC1-SB01-0.5-2	Solid	PFHxA	PFAS by ID	1.1		ug/kg	20
006	AOPC1-SB01-0.5-2	Solid	PFNA	PFAS by ID	0.71	J	ug/kg	20
006	AOPC1-SB01-0.5-2	Solid	PFOA	PFAS by ID	30		ug/kg	20
006	AOPC1-SB01-0.5-2	Solid	PFPeA	PFAS by ID	0.80	J	ug/kg	20
006	AOPC1-SB01-0.5-2	Solid	PFOS	PFAS by ID	40		ug/kg	20
007	AOPC1-SB02-0-0.5	Solid	PFHxS	PFAS by ID	0.46	J	ug/kg	22

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
007	AOPC1-SB02-0-0.5	Solid	PFHpA	PFAS by ID	0.18	J	ug/kg	22
007	AOPC1-SB02-0-0.5	Solid	PFHxA	PFAS by ID	0.27	J	ug/kg	22
007	AOPC1-SB02-0-0.5	Solid	PFOA	PFAS by ID	0.29	J	ug/kg	22
007	AOPC1-SB02-0-0.5	Solid	PFPeA	PFAS by ID	0.44	J	ug/kg	22
007	AOPC1-SB02-0-0.5	Solid	PFOS	PFAS by ID	11		ug/kg	22
008	AOPC1-SB02-0.5-2	Solid	PFHxS	PFAS by ID	1.2		ug/kg	24
008	AOPC1-SB02-0.5-2	Solid	PFBA	PFAS by ID	0.47	J	ug/kg	24
008	AOPC1-SB02-0.5-2	Solid	PFHpA	PFAS by ID	0.52	J	ug/kg	24
008	AOPC1-SB02-0.5-2	Solid	PFHxA	PFAS by ID	0.82	J	ug/kg	24
008	AOPC1-SB02-0.5-2	Solid	PFOA	PFAS by ID	7.1		ug/kg	24
008	AOPC1-SB02-0.5-2	Solid	PFPeA	PFAS by ID	0.85	J	ug/kg	24
008	AOPC1-SB02-0.5-2	Solid	PFOS	PFAS by ID	2.5		ug/kg	24
009	AOPC1-SB03-0-0.5	Solid	PFBS	PFAS by ID	1.8		ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFDS	PFAS by ID	2.5		ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFHpS	PFAS by ID	0.77	J	ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFNS	PFAS by ID	3.0		ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFOSA	PFAS by ID	4.7		ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFPeS	PFAS by ID	3.0		ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFHxS	PFAS by ID	26		ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFBA	PFAS by ID	0.51	J	ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFHpA	PFAS by ID	0.24	J	ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFHxA	PFAS by ID	3.6		ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFOA	PFAS by ID	1.6		ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFPeA	PFAS by ID	0.76	J	ug/kg	26
009	AOPC1-SB03-0-0.5	Solid	PFOS	PFAS by ID	300		ug/kg	26
010	AOPC1-SB03-0.5-2	Solid	PFBS	PFAS by ID	1.2		ug/kg	28
010	AOPC1-SB03-0.5-2	Solid	PFHpS	PFAS by ID	3.8		ug/kg	28
010	AOPC1-SB03-0.5-2	Solid	PFOSA	PFAS by ID	0.27	J	ug/kg	28
010	AOPC1-SB03-0.5-2	Solid	PFPeS	PFAS by ID	3.2		ug/kg	28
010	AOPC1-SB03-0.5-2	Solid	PFHxS	PFAS by ID	42		ug/kg	28
010	AOPC1-SB03-0.5-2	Solid	PFBA	PFAS by ID	0.49	J	ug/kg	28
010	AOPC1-SB03-0.5-2	Solid	PFHpA	PFAS by ID	0.30	J	ug/kg	28
010	AOPC1-SB03-0.5-2	Solid	PFHxA	PFAS by ID	4.0		ug/kg	28
010	AOPC1-SB03-0.5-2	Solid	PFOA	PFAS by ID	2.2		ug/kg	28
010	AOPC1-SB03-0.5-2	Solid	PFPeA	PFAS by ID	1.0	J	ug/kg	28
010	AOPC1-SB03-0.5-2	Solid	PFOS	PFAS by ID	920		ug/kg	28
011	AOPC1-SB04-0-0.5	Solid	PFHpS	PFAS by ID	0.21	J	ug/kg	30
011	AOPC1-SB04-0-0.5	Solid	PFHxS	PFAS by ID	5.8		ug/kg	30
011	AOPC1-SB04-0-0.5	Solid	PFBA	PFAS by ID	0.36	J	ug/kg	30
011	AOPC1-SB04-0-0.5	Solid	PFDA	PFAS by ID	0.54	J	ug/kg	30
011	AOPC1-SB04-0-0.5	Solid	PFDoA	PFAS by ID	0.25	J	ug/kg	30
011	AOPC1-SB04-0-0.5	Solid	PFHpA	PFAS by ID	1.6		ug/kg	30
011	AOPC1-SB04-0-0.5	Solid	PFHxA	PFAS by ID	3.1		ug/kg	30
011	AOPC1-SB04-0-0.5	Solid	PFNA	PFAS by ID	0.26	J	ug/kg	30
011	AOPC1-SB04-0-0.5	Solid	PFOA	PFAS by ID	120		ug/kg	30
011	AOPC1-SB04-0-0.5	Solid	PFPeA	PFAS by ID	1.0		ug/kg	30
011	AOPC1-SB04-0-0.5	Solid	PFOS	PFAS by ID	22		ug/kg	30
012	AOPC1-SB04-0.5-2	Solid	PFHxS	PFAS by ID	5.5		ug/kg	32

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
012	AOPC1-SB04-0.5-2	Solid	PFBA	PFAS by ID	1.1		ug/kg	32
012	AOPC1-SB04-0.5-2	Solid	PFHpA	PFAS by ID	0.56	J	ug/kg	32
012	AOPC1-SB04-0.5-2	Solid	PFHxA	PFAS by ID	1.9		ug/kg	32
012	AOPC1-SB04-0.5-2	Solid	PFOA	PFAS by ID	45		ug/kg	32
012	AOPC1-SB04-0.5-2	Solid	PFPeA	PFAS by ID	1.9		ug/kg	32
012	AOPC1-SB04-0.5-2	Solid	PFOS	PFAS by ID	6.2		ug/kg	32
013	AOPC6-SB01-0-0.5	Solid	8:2 FTS	PFAS by ID	0.81	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	EtFOSAA	PFAS by ID	1.1	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFBS	PFAS by ID	0.36	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFDS	PFAS by ID	0.42	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFHpS	PFAS by ID	0.44	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFNS	PFAS by ID	0.33	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFOSA	PFAS by ID	0.43	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFPeS	PFAS by ID	0.58	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFHxS	PFAS by ID	12		ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFDA	PFAS by ID	1.2		ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFDoA	PFAS by ID	0.94		ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFHxA	PFAS by ID	1.1		ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFOA	PFAS by ID	0.45	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFPeA	PFAS by ID	0.20	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFTeDA	PFAS by ID	0.28	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFTrDA	PFAS by ID	0.19	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFUdA	PFAS by ID	0.40	J	ug/kg	34
013	AOPC6-SB01-0-0.5	Solid	PFOS	PFAS by ID	120		ug/kg	34
014	AOPC6-SB01-0.5-2	Solid	PFBS	PFAS by ID	0.29	J	ug/kg	36
014	AOPC6-SB01-0.5-2	Solid	PFHpS	PFAS by ID	25		ug/kg	36
014	AOPC6-SB01-0.5-2	Solid	PFPeS	PFAS by ID	0.94	J	ug/kg	36
014	AOPC6-SB01-0.5-2	Solid	PFHxS	PFAS by ID	92		ug/kg	36
014	AOPC6-SB01-0.5-2	Solid	PFBA	PFAS by ID	0.58	J	ug/kg	36
014	AOPC6-SB01-0.5-2	Solid	PFHpA	PFAS by ID	0.47	J	ug/kg	36
014	AOPC6-SB01-0.5-2	Solid	PFHxA	PFAS by ID	4.1		ug/kg	36
014	AOPC6-SB01-0.5-2	Solid	PFNA	PFAS by ID	0.43	J	ug/kg	36
014	AOPC6-SB01-0.5-2	Solid	PFOA	PFAS by ID	5.1		ug/kg	36
014	AOPC6-SB01-0.5-2	Solid	PFPeA	PFAS by ID	1.5		ug/kg	36
014	AOPC6-SB01-0.5-2	Solid	PFOS	PFAS by ID	1900		ug/kg	36
015	AOPC2-SB01-0-0.5	Solid	PFHpS	PFAS by ID	0.60	J	ug/kg	38
015	AOPC2-SB01-0-0.5	Solid	PFOSA	PFAS by ID	0.54	J	ug/kg	38
015	AOPC2-SB01-0-0.5	Solid	PFPeS	PFAS by ID	0.28	J	ug/kg	38
015	AOPC2-SB01-0-0.5	Solid	PFHxS	PFAS by ID	14		ug/kg	38
015	AOPC2-SB01-0-0.5	Solid	PFBA	PFAS by ID	1.3		ug/kg	38
015	AOPC2-SB01-0-0.5	Solid	PFHpA	PFAS by ID	0.60	J	ug/kg	38
015	AOPC2-SB01-0-0.5	Solid	PFHxA	PFAS by ID	1.3		ug/kg	38
015	AOPC2-SB01-0-0.5	Solid	PFNA	PFAS by ID	0.67	J	ug/kg	38
015	AOPC2-SB01-0-0.5	Solid	PFOA	PFAS by ID	6.3		ug/kg	38
015	AOPC2-SB01-0-0.5	Solid	PFPeA	PFAS by ID	0.65	J	ug/kg	38
015	AOPC2-SB01-0-0.5	Solid	PFOS	PFAS by ID	41		ug/kg	38
016	AOPC2-SB01-0.5-2	Solid	PFHpS	PFAS by ID	0.36	J	ug/kg	40
016	AOPC2-SB01-0.5-2	Solid	PFHxS	PFAS by ID	10		ug/kg	40

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
016	AOPC2-SB01-0.5-2	Solid	PFBA	PFAS by ID	0.66	J	ug/kg	40
016	AOPC2-SB01-0.5-2	Solid	PFHxA	PFAS by ID	1.2		ug/kg	40
016	AOPC2-SB01-0.5-2	Solid	PFOA	PFAS by ID	5.1		ug/kg	40
016	AOPC2-SB01-0.5-2	Solid	PFPeA	PFAS by ID	0.62	J	ug/kg	40
016	AOPC2-SB01-0.5-2	Solid	PFOS	PFAS by ID	12		ug/kg	40
017	AOPC2-SB02-0-0.5	Solid	PFBS	PFAS by ID	0.23	J	ug/kg	42
017	AOPC2-SB02-0-0.5	Solid	PFHpS	PFAS by ID	0.44	J	ug/kg	42
017	AOPC2-SB02-0-0.5	Solid	PFHxS	PFAS by ID	6.5		ug/kg	42
017	AOPC2-SB02-0-0.5	Solid	PFBA	PFAS by ID	1.5		ug/kg	42
017	AOPC2-SB02-0-0.5	Solid	PFDA	PFAS by ID	0.29	J	ug/kg	42
017	AOPC2-SB02-0-0.5	Solid	PFHpA	PFAS by ID	1.4		ug/kg	42
017	AOPC2-SB02-0-0.5	Solid	PFHxA	PFAS by ID	2.0		ug/kg	42
017	AOPC2-SB02-0-0.5	Solid	PFNA	PFAS by ID	1.1		ug/kg	42
017	AOPC2-SB02-0-0.5	Solid	PFOA	PFAS by ID	7.7		ug/kg	42
017	AOPC2-SB02-0-0.5	Solid	PFPeA	PFAS by ID	1.1		ug/kg	42
017	AOPC2-SB02-0-0.5	Solid	PFOS	PFAS by ID	19		ug/kg	42
018	AOPC2-SB02-0.5-2	Solid	PFHxS	PFAS by ID	2.6		ug/kg	44
018	AOPC2-SB02-0.5-2	Solid	PFBA	PFAS by ID	1.6		ug/kg	44
018	AOPC2-SB02-0.5-2	Solid	PFHxA	PFAS by ID	0.81	J	ug/kg	44
018	AOPC2-SB02-0.5-2	Solid	PFOA	PFAS by ID	1.1		ug/kg	44
018	AOPC2-SB02-0.5-2	Solid	PFPeA	PFAS by ID	0.29	J	ug/kg	44
019	AOPC2-SB03-0-0.5	Solid	PFHxS	PFAS by ID	1.2		ug/kg	46
019	AOPC2-SB03-0-0.5	Solid	PFBA	PFAS by ID	1.1	J	ug/kg	46
019	AOPC2-SB03-0-0.5	Solid	PFHpA	PFAS by ID	0.45	J	ug/kg	46
019	AOPC2-SB03-0-0.5	Solid	PFHxA	PFAS by ID	0.86	J	ug/kg	46
019	AOPC2-SB03-0-0.5	Solid	PFNA	PFAS by ID	0.25	J	ug/kg	46
019	AOPC2-SB03-0-0.5	Solid	PFOA	PFAS by ID	1.8		ug/kg	46
019	AOPC2-SB03-0-0.5	Solid	PFPeA	PFAS by ID	0.65	J	ug/kg	46
019	AOPC2-SB03-0-0.5	Solid	PFOS	PFAS by ID	4.2	S	ug/kg	46
021	AOPC2-SB04-0-0.5	Solid	PFBS	PFAS by ID	0.54	J	ug/kg	50
021	AOPC2-SB04-0-0.5	Solid	PFHxS	PFAS by ID	3.8		ug/kg	50
021	AOPC2-SB04-0-0.5	Solid	PFBA	PFAS by ID	4.4		ug/kg	50
021	AOPC2-SB04-0-0.5	Solid	PFHpA	PFAS by ID	0.76	J	ug/kg	50
021	AOPC2-SB04-0-0.5	Solid	PFHxA	PFAS by ID	2.2		ug/kg	50
021	AOPC2-SB04-0-0.5	Solid	PFNA	PFAS by ID	0.25	J	ug/kg	50
021	AOPC2-SB04-0-0.5	Solid	PFOA	PFAS by ID	4.2		ug/kg	50
021	AOPC2-SB04-0-0.5	Solid	PFPeA	PFAS by ID	1.5		ug/kg	50
021	AOPC2-SB04-0-0.5	Solid	PFOS	PFAS by ID	6.7		ug/kg	50
022	AOPC2-SB04-0.5-2	Solid	PFHxS	PFAS by ID	1.3		ug/kg	52
022	AOPC2-SB04-0.5-2	Solid	PFBA	PFAS by ID	2.2		ug/kg	52
022	AOPC2-SB04-0.5-2	Solid	PFHxA	PFAS by ID	0.28	J	ug/kg	52
023	AOPC2-SB05-0-0.5	Solid	PFOSA	PFAS by ID	0.31	J	ug/kg	54
023	AOPC2-SB05-0-0.5	Solid	PFHxS	PFAS by ID	2.8		ug/kg	54
023	AOPC2-SB05-0-0.5	Solid	PFBA	PFAS by ID	0.34	J	ug/kg	54
023	AOPC2-SB05-0-0.5	Solid	PFHpA	PFAS by ID	0.31	J	ug/kg	54
023	AOPC2-SB05-0-0.5	Solid	PFHxA	PFAS by ID	0.71	J	ug/kg	54
023	AOPC2-SB05-0-0.5	Solid	PFNA	PFAS by ID	0.58	J	ug/kg	54
023	AOPC2-SB05-0-0.5	Solid	PFOA	PFAS by ID	0.64	J	ug/kg	54

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
023	AOPC2-SB05-0-0.5	Solid	PFPeA	PFAS by ID	0.28	J	ug/kg	54
023	AOPC2-SB05-0-0.5	Solid	PFOS	PFAS by ID	14		ug/kg	54
024	AOPC2-SB05-0.5-2	Solid	PFHpS	PFAS by ID	0.41	J	ug/kg	56
024	AOPC2-SB05-0.5-2	Solid	PFOSA	PFAS by ID	0.27	J	ug/kg	56
024	AOPC2-SB05-0.5-2	Solid	PFPeS	PFAS by ID	0.31	J	ug/kg	56
024	AOPC2-SB05-0.5-2	Solid	PFHxS	PFAS by ID	14		ug/kg	56
024	AOPC2-SB05-0.5-2	Solid	PFBA	PFAS by ID	0.86	J	ug/kg	56
024	AOPC2-SB05-0.5-2	Solid	PFHpA	PFAS by ID	0.63	J	ug/kg	56
024	AOPC2-SB05-0.5-2	Solid	PFHxA	PFAS by ID	1.2		ug/kg	56
024	AOPC2-SB05-0.5-2	Solid	PFNA	PFAS by ID	0.39	J	ug/kg	56
024	AOPC2-SB05-0.5-2	Solid	PFOA	PFAS by ID	3.3		ug/kg	56
024	AOPC2-SB05-0.5-2	Solid	PFPeA	PFAS by ID	0.69	J	ug/kg	56
024	AOPC2-SB05-0.5-2	Solid	PFOS	PFAS by ID	21		ug/kg	56
025	AOPC2-SB06-0-0.5	Solid	PFHxS	PFAS by ID	1.5		ug/kg	58
025	AOPC2-SB06-0-0.5	Solid	PFBA	PFAS by ID	0.59	J	ug/kg	58
025	AOPC2-SB06-0-0.5	Solid	PFHpA	PFAS by ID	1.1		ug/kg	58
025	AOPC2-SB06-0-0.5	Solid	PFHxA	PFAS by ID	1.0	J	ug/kg	58
025	AOPC2-SB06-0-0.5	Solid	PFNA	PFAS by ID	0.72	J	ug/kg	58
025	AOPC2-SB06-0-0.5	Solid	PFOA	PFAS by ID	3.5		ug/kg	58
025	AOPC2-SB06-0-0.5	Solid	PFPeA	PFAS by ID	0.63	J	ug/kg	58
025	AOPC2-SB06-0-0.5	Solid	PFOS	PFAS by ID	9.6		ug/kg	58
026	AOPC2-SB06-0.5-2	Solid	PFBA	PFAS by ID	0.89	J	ug/kg	60
026	AOPC2-SB06-0.5-2	Solid	PFOA	PFAS by ID	0.26	J	ug/kg	60
027	AOPC2-SB07-0-0.5	Solid	PFHxS	PFAS by ID	0.68	J	ug/kg	62
027	AOPC2-SB07-0-0.5	Solid	PFBA	PFAS by ID	1.1	J	ug/kg	62
027	AOPC2-SB07-0-0.5	Solid	PFHpA	PFAS by ID	0.61	J	ug/kg	62
027	AOPC2-SB07-0-0.5	Solid	PFHxA	PFAS by ID	0.67	J	ug/kg	62
027	AOPC2-SB07-0-0.5	Solid	PFOA	PFAS by ID	2.4		ug/kg	62
027	AOPC2-SB07-0-0.5	Solid	PFPeA	PFAS by ID	0.39	J	ug/kg	62
027	AOPC2-SB07-0-0.5	Solid	PFOS	PFAS by ID	4.9		ug/kg	62
028	AOPC2-SB07-0.5-2	Solid	PFBA	PFAS by ID	1.2		ug/kg	64
028	AOPC2-SB07-0.5-2	Solid	PFHpA	PFAS by ID	0.23	J	ug/kg	64
028	AOPC2-SB07-0.5-2	Solid	PFHxA	PFAS by ID	0.30	J	ug/kg	64
028	AOPC2-SB07-0.5-2	Solid	PFPeA	PFAS by ID	0.24	J	ug/kg	64

(269 detections)

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-001
Description: AOPC7-SB01-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1000 | Project Name: NASA ARC PFAS | % Solids: 78.5 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1753	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.56	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.39	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.97	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.62	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.35	J	1.1	0.55	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.6		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.50	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.27	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.58	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.87	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.39	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.4		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.4		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.63	J	1.1	0.55	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	110		1.1	0.55	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		98	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		88	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-001
Description: AOPC7-SB01-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1000	Project Name: NASA ARC PFAS	% Solids: 78.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-002
Description: AOPC7-SB01-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1005 | Project Name: NASA ARC PFAS | % Solids: 92.5 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1825	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.48	U	0.96	0.48	0.19	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.48	U	0.96	0.48	0.19	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.39	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.32	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.34	J	0.96	0.48	0.19	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4.8		0.96	0.48	0.19	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.47	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.47	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.48	U	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.60	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.81	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.72	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.1		0.96	0.48	0.19	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1		0.96	0.48	0.19	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.48	U	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.48	U	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.26	J	0.96	0.48	0.19	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	140		0.96	0.48	0.19	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	50-150
13C2_6:2FTS		87	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		76	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-002
Description: AOPC7-SB01-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1005	Project Name: NASA ARC PFAS	% Solids: 92.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-003
Description: AOPC7-SB02-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1030 | Project Name: NASA ARC PFAS | % Solids: 76.0 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1835	JJG	07/25/2021 1645	99970
2	SOP SPE	PFAS by ID SOP QSM B-15	5	07/28/2021 1436	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.78	J	2.4	1.2	0.61	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.3	J	2.4	1.2	0.61	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.5	U	4.9	2.5	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	J	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	5.1		1.2	0.60	0.24	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.4		1.2	0.60	0.24	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	4.2		1.2	0.60	0.24	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	4.6		1.2	0.60	0.24	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.4		1.2	0.60	0.24	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	23		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.8		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.95	J	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	11		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	12		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.0		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	31		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.4		1.2	0.60	0.24	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	300		6.1	3.1	1.2	ug/kg	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		69	50-150		91	50-150
13C2_6:2FTS		82	50-150		96	50-150
13C2_8:2FTS		74	50-150		87	50-150
13C2_PFDoA		69	50-150		94	50-150
13C2_PFTeDA		72	50-150		91	50-150
13C3_PFBS		63	50-150		89	50-150
13C3_PFHxS		67	50-150		89	50-150
13C3-HFPO-DA		75	50-150		94	50-150
13C4_PFBA		66	50-150		88	50-150
13C4_PFHpA		71	50-150		90	50-150
13C5_PFHxA		70	50-150		86	50-150
13C5_PFPeA		66	50-150		91	50-150
13C6_PFDA		70	50-150		81	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-003
Description: AOPC7-SB02-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1030	Project Name: NASA ARC PFAS	% Solids: 76.0 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		75	50-150		98	50-150
13C8_PFOA		71	50-150		89	50-150
13C8_PFOS		61	50-150		96	50-150
13C8_PFOSA		78	50-150		97	50-150
13C9_PFNA		63	50-150		93	50-150
d5-EtFOSAA		79	50-150		97	50-150
d3-MeFOSAA		77	50-150		93	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-004
Description: AOPC7-SB02-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1035 | Project Name: NASA ARC PFAS | % Solids: 83.5 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1846	JJG	07/25/2021 1645	99970
2	SOP SPE	PFAS by ID SOP QSM B-15	20	07/28/2021 1446	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.73	J	2.2	1.1	0.54	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.41	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.4		1.1	0.55	0.22	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	3.0		1.1	0.55	0.22	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	4.4		1.1	0.55	0.22	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	24		1.1	0.55	0.22	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.70	J	1.1	0.55	0.22	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	21		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.92	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.4		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.4		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.8		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.6		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.2		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	7.8		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.52	J	1.1	0.55	0.22	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1500		22	11	4.3	ug/kg	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		83	50-150		90	50-150
13C2_6:2FTS		95	50-150		97	50-150
13C2_8:2FTS		89	50-150		94	50-150
13C2_PFDoA		77	50-150		88	50-150
13C2_PFTeDA		80	50-150		90	50-150
13C3_PFBS		79	50-150		91	50-150
13C3_PFHxS		87	50-150		93	50-150
13C3-HFPO-DA		87	50-150		97	50-150
13C4_PFBA		79	50-150		91	50-150
13C4_PFHpA		80	50-150		96	50-150
13C5_PFHxA		79	50-150		85	50-150
13C5_PFPeA		79	50-150		92	50-150
13C6_PFDA		86	50-150		93	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-004
Description: AOPC7-SB02-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1035	Project Name: NASA ARC PFAS	% Solids: 83.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		84	50-150		90	50-150
13C8_PFOA		84	50-150		98	50-150
13C8_PFOS		58	50-150		93	50-150
13C8_PFOSA		99	50-150		92	50-150
13C9_PFNA		60	50-150		96	50-150
d5-EtFOSAA		88	50-150		93	50-150
d3-MeFOSAA		87	50-150		99	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-005
Description: AOPC1-SB01-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1100 | Project Name: NASA ARC PFAS | % Solids: 90.8 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1856	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.19	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.47	U	0.94	0.47	0.19	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.39	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.34	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.4		0.94	0.47	0.19	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.24	J	0.94	0.47	0.19	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	7.8		0.94	0.47	0.19	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.48	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.81	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.47	U	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.36	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.0		0.94	0.47	0.19	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.29	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	7.0		0.94	0.47	0.19	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.43	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.47	U	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.47	U	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.25	J	0.94	0.47	0.19	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	61		0.94	0.47	0.19	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		80	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-005
Description: AOPC1-SB01-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1100	Project Name: NASA ARC PFAS	% Solids: 90.8 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-006
Description: AOPC1-SB01-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1105 | Project Name: NASA ARC PFAS | % Solids: 86.6 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1907	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.31	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.1		0.98	0.49	0.20	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.54	J	0.98	0.49	0.20	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	22		0.98	0.49	0.20	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.59	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.36	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.1		0.98	0.49	0.20	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.71	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	30		0.98	0.49	0.20	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.80	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	40		0.98	0.49	0.20	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		83	50-150
13C2_6:2FTS		91	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		77	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		79	50-150
13C6_PFDA		78	50-150
13C7_PFUdA		88	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-006
Description: AOPC1-SB01-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1105	Project Name: NASA ARC PFAS	% Solids: 86.6 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	50-150
13C8_PFOS		77	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-007
Description: AOPC1-SB02-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1120 | Project Name: NASA ARC PFAS | % Solids: 98.2 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1918	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.90	UQ	1.8	0.90	0.45	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.46	J	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.18	J	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.27	J	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.29	J	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.44	J	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	11		0.91	0.46	0.18	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		108	50-150
13C2_6:2FTS		135	50-150
13C2_8:2FTS	N	214	50-150
13C2_PFDoA		95	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		99	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-007
Description: AOPC1-SB02-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1120	Project Name: NASA ARC PFAS	% Solids: 98.2 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	50-150
13C8_PFOS		90	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		140	50-150
d3-MeFOSAA		142	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-008
Description: AOPC1-SB02-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1125 | Project Name: NASA ARC PFAS | % Solids: 81.8 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1928	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.2		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.47	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.52	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.82	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	7.1		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.85	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.5		1.2	0.60	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		78	50-150
13C2_6:2FTS		98	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		73	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		74	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		84	50-150
13C7_PFUdA		81	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-008
Description: AOPC1-SB02-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1125	Project Name: NASA ARC PFAS	% Solids: 81.8 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		75	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-009
Description: AOPC1-SB03-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1140 | Project Name: NASA ARC PFAS | % Solids: 98.5 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1939	JJG	07/25/2021 1645	99970
2	SOP SPE	PFAS by ID SOP QSM B-15	5	07/28/2021 1457	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8		0.89	0.45	0.18	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.5		0.89	0.45	0.18	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.77	J	0.89	0.45	0.18	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.0		0.89	0.45	0.18	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	4.7		0.89	0.45	0.18	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.0		0.89	0.45	0.18	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	26		0.89	0.45	0.18	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.51	J	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.24	J	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.6		0.89	0.45	0.18	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.6		0.89	0.45	0.18	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.76	J	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	300		4.5	2.3	0.89	ug/kg	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		84	50-150		92	50-150
13C2_6:2FTS		97	50-150		102	50-150
13C2_8:2FTS		98	50-150		90	50-150
13C2_PFDoA		86	50-150		85	50-150
13C2_PFTeDA		84	50-150		94	50-150
13C3_PFBS		73	50-150		91	50-150
13C3_PFHxS		81	50-150		91	50-150
13C3-HFPO-DA		84	50-150		94	50-150
13C4_PFBA		78	50-150		89	50-150
13C4_PFHpA		85	50-150		88	50-150
13C5_PFHxA		79	50-150		86	50-150
13C5_PFPeA		79	50-150		94	50-150
13C6_PFDA		81	50-150		87	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-009
Description: AOPC1-SB03-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1140	Project Name: NASA ARC PFAS	% Solids: 98.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		87	50-150		98	50-150
13C8_PFOA		79	50-150		93	50-150
13C8_PFOS		73	50-150		93	50-150
13C8_PFOSA		90	50-150		99	50-150
13C9_PFNA		73	50-150		95	50-150
d5-EtFOSAA		99	50-150		100	50-150
d3-MeFOSAA		91	50-150		94	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-010
Description: AOPC1-SB03-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1145 | Project Name: NASA ARC PFAS | % Solids: 87.6 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1950	JJG	07/25/2021 1645	99970
2	SOP SPE	PFAS by ID SOP QSM B-15	10	07/28/2021 1508	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.3	U	4.6	2.3	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.2		1.1	0.55	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	3.8		1.1	0.55	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.27	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.2		1.1	0.55	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	42		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.49	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.30	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.0		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.2		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.0	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	920		11	5.5	2.3	ug/kg	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		68	50-150		93	50-150
13C2_6:2FTS		74	50-150		97	50-150
13C2_8:2FTS		77	50-150		88	50-150
13C2_PFDoA		72	50-150		94	50-150
13C2_PFTeDA		75	50-150		92	50-150
13C3_PFBS		61	50-150		88	50-150
13C3_PFHxS		71	50-150		87	50-150
13C3-HFPO-DA		73	50-150		97	50-150
13C4_PFBA		68	50-150		91	50-150
13C4_PFHpA		77	50-150		92	50-150
13C5_PFHxA		67	50-150		83	50-150
13C5_PFPeA		71	50-150		95	50-150
13C6_PFDA		69	50-150		87	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-010
Description: AOPC1-SB03-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1145	Project Name: NASA ARC PFAS	% Solids: 87.6 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		81	50-150		91	50-150
13C8_PFOA		67	50-150		93	50-150
13C8_PFOS		59	50-150		92	50-150
13C8_PFOSA		82	50-150		96	50-150
13C9_PFNA		62	50-150		91	50-150
d5-EtFOSAA		74	50-150		98	50-150
d3-MeFOSAA		76	50-150		101	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-011
Description: AOPC1-SB04-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1200 | Project Name: NASA ARC PFAS | % Solids: 93.9 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2000	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.21	J	1.0	0.50	0.20	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.8		1.0	0.50	0.20	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.36	J	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.54	J	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.25	J	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.6		1.0	0.50	0.20	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.1		1.0	0.50	0.20	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.26	J	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	120		1.0	0.50	0.20	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.0		1.0	0.50	0.20	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	22		1.0	0.50	0.20	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		98	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		149	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		98	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-011
Description: AOPC1-SB04-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1200	Project Name: NASA ARC PFAS	% Solids: 93.9 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		116	50-150
d3-MeFOSAA		119	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-012
Description: AOPC1-SB04-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1205 | Project Name: NASA ARC PFAS | % Solids: 82.3 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2043	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.5		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.1		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.56	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	45		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	6.2		1.1	0.55	0.21	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		73	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		81	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-012
Description: AOPC1-SB04-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1205	Project Name: NASA ARC PFAS	% Solids: 82.3 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		80	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-013
Description: AOPC6-SB01-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1320 | Project Name: NASA ARC PFAS | % Solids: 98.1 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2054	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.81	J	1.7	0.85	0.43	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.86	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	J	1.7	0.85	0.43	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.36	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.42	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.44	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.33	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.43	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.58	J	0.86	0.43	0.17	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	12		0.86	0.43	0.17	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.43	U	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.2		0.86	0.43	0.17	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.94		0.86	0.43	0.17	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.43	U	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.1		0.86	0.43	0.17	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.43	U	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.45	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.20	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.28	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.19	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.40	J	0.86	0.43	0.17	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	120		0.86	0.43	0.17	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		81	50-150
13C2_6:2FTS		89	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		77	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-013
Description: AOPC6-SB01-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1320	Project Name: NASA ARC PFAS	% Solids: 98.1 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		110	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-014
Description: AOPC6-SB01-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1325 | Project Name: NASA ARC PFAS | % Solids: 77.2 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2104	JJG	07/25/2021 1645	99970
2	SOP SPE	PFAS by ID SOP QSM B-15	20	07/28/2021 1539	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.29	J	1.3	0.65	0.26	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	25		1.3	0.65	0.26	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.94	J	1.3	0.65	0.26	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	92		1.3	0.65	0.26	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.58	J	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.47	J	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.1		1.3	0.65	0.26	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.43	J	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	5.1		1.3	0.65	0.26	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.5		1.3	0.65	0.26	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1900		26	13	5.1	ug/kg	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		91	50-150		96	50-150
13C2_6:2FTS		92	50-150		97	50-150
13C2_8:2FTS		89	50-150		93	50-150
13C2_PFDoA		88	50-150		89	50-150
13C2_PFTeDA		87	50-150		93	50-150
13C3_PFBS		86	50-150		88	50-150
13C3_PFHxS		84	50-150		97	50-150
13C3-HFPO-DA		92	50-150		99	50-150
13C4_PFBA		84	50-150		93	50-150
13C4_PFHpA		90	50-150		97	50-150
13C5_PFHxA		86	50-150		88	50-150
13C5_PFPeA		86	50-150		97	50-150
13C6_PFDA		82	50-150		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-014
Description: AOPC6-SB01-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1325	Project Name: NASA ARC PFAS	% Solids: 77.2 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		86	50-150		97	50-150
13C8_PFOA		86	50-150		97	50-150
13C8_PFOS		70	50-150		96	50-150
13C8_PFOSA		99	50-150		95	50-150
13C9_PFNA		68	50-150		94	50-150
d5-EtFOSAA		95	50-150		105	50-150
d3-MeFOSAA		91	50-150		100	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-015
Description: AOPC2-SB01-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1430 | Project Name: NASA ARC PFAS | % Solids: 85.4 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2115	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.60	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.54	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.28	J	1.1	0.55	0.21	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	14		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.3		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.60	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.3		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.67	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	6.3		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.65	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	41		1.1	0.55	0.21	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		70	50-150
13C2_6:2FTS		70	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		65	50-150
13C2_PFTeDA		66	50-150
13C3_PFBS		69	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		74	50-150
13C4_PFBA		65	50-150
13C4_PFHpA		69	50-150
13C5_PFHxA		67	50-150
13C5_PFPeA		66	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		75	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-015
Description: AOPC2-SB01-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1430	Project Name: NASA ARC PFAS	% Solids: 85.4 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		67	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		68	50-150
d5-EtFOSAA		68	50-150
d3-MeFOSAA		66	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-016
Description: AOPC2-SB01-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1435 | Project Name: NASA ARC PFAS | % Solids: 84.1 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2126	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.36	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	10		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.66	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.2		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	5.1		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.62	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	12		1.2	0.60	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	50-150
13C2_6:2FTS		95	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		94	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-016
Description: AOPC2-SB01-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1435	Project Name: NASA ARC PFAS	% Solids: 84.1 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		98	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-017
Description: AOPC2-SB02-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1445 | Project Name: NASA ARC PFAS | % Solids: 86.9 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2136	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.23	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.44	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	6.5		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.5		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.29	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.4		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.1		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	7.7		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	19		1.1	0.55	0.21	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	50-150
13C2_6:2FTS		91	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		77	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		73	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-017
Description: AOPC2-SB02-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1445	Project Name: NASA ARC PFAS	% Solids: 86.9 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		75	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		76	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-018
Description: AOPC2-SB02-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1450 | Project Name: NASA ARC PFAS | % Solids: 85.2 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2147	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.6		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.6		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.81	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.1		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.29	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		81	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		80	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		78	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		82	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-018
Description: AOPC2-SB02-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1450	Project Name: NASA ARC PFAS	% Solids: 85.2 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		77	50-150
d5-EtFOSAA		75	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-019
Description: AOPC2-SB03-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1500 | Project Name: NASA ARC PFAS | % Solids: 80.0 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2158	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.3	US	2.5	1.3	0.62	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.5	U	5.0	2.5	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.2		1.2	0.60	0.25	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.1	J	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.45	J	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.86	J	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.25	J	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8		1.2	0.60	0.25	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.65	J	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.2	S	1.2	0.60	0.25	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		88	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-019
Description: AOPC2-SB03-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1500	Project Name: NASA ARC PFAS	% Solids: 80.0 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		80	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		102	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-020
Description: AOPC2-SB03-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1505 | Project Name: NASA ARC PFAS | % Solids: 82.2 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2016	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	US	2.4	1.2	0.60	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	US	2.4	1.2	0.60	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.4	U	4.8	2.4	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.60	US	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	US	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	50-150
13C2_6:2FTS		86	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		85	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-020
Description: AOPC2-SB03-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1505	Project Name: NASA ARC PFAS	% Solids: 82.2 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	50-150
13C8_PFOS		92	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-021
Description: AOPC2-SB04-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1510 | Project Name: NASA ARC PFAS | % Solids: 78.8 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2229	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.54	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3.8		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.4		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.76	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.2		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.25	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.2		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.5		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	6.7		1.1	0.55	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		81	50-150
13C4_PFBA		73	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		75	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		77	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-021
Description: AOPC2-SB04-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1510	Project Name: NASA ARC PFAS	% Solids: 78.8 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	50-150
13C8_PFOS		87	50-150
13C8_PFOSA		93	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20002-022
Description: AOPC2-SB04-0.5-2			Matrix: Solid
Date Sampled: 07/13/2021 1515	Project Name: NASA ARC PFAS		% Solids: 85.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2048	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.3		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.2		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.28	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		90	50-150
13C2_6:2FTS		88	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		90	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		85	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-022
Description: AOPC2-SB04-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1515	Project Name: NASA ARC PFAS	% Solids: 85.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-023
Description: AOPC2-SB05-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1520 | Project Name: NASA ARC PFAS | % Solids: 89.0 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2058	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.31	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.8		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.34	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.31	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.71	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.58	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.64	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.28	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	14		1.1	0.55	0.22	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		87	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-023
Description: AOPC2-SB05-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1520	Project Name: NASA ARC PFAS	% Solids: 89.0 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		92	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-024
Description: AOPC2-SB05-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1525 | Project Name: NASA ARC PFAS | % Solids: 82.8 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2109	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.41	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.27	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.31	J	1.0	0.50	0.21	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	14		1.0	0.50	0.21	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.86	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.63	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.2		1.0	0.50	0.21	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.39	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.3		1.0	0.50	0.21	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.69	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	21		1.0	0.50	0.21	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		83	50-150
13C2_6:2FTS		89	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-024
Description: AOPC2-SB05-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1525	Project Name: NASA ARC PFAS	% Solids: 82.8 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-025
Description: AOPC2-SB06-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1530 | Project Name: NASA ARC PFAS | % Solids: 91.4 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2120	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.5		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.59	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.1		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.0	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.72	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.5		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.63	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.6		1.1	0.55	0.21	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	50-150
13C2_6:2FTS		86	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		74	50-150
13C5_PFPeA		81	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		86	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-025
Description: AOPC2-SB06-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1530	Project Name: NASA ARC PFAS	% Solids: 91.4 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		72	50-150
d3-MeFOSAA		70	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-026
Description: AOPC2-SB06-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1535 | Project Name: NASA ARC PFAS | % Solids: 84.3 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2130	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.3	U	4.6	2.3	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.89	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.26	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	50-150
13C2_6:2FTS		88	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		82	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		77	50-150
13C3_PFHxS		76	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		75	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		77	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-026
Description: AOPC2-SB06-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1535	Project Name: NASA ARC PFAS	% Solids: 84.3 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-027
Description: AOPC2-SB07-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1540 | Project Name: NASA ARC PFAS | % Solids: 80.8 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2141	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.68	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.1	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.61	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.67	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.4		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.39	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.9		1.2	0.60	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		83	50-150
13C2_6:2FTS		88	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		82	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		84	50-150
13C6_PFDA		80	50-150
13C7_PFUdA		93	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-027
Description: AOPC2-SB07-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1540	Project Name: NASA ARC PFAS	% Solids: 80.8 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-028
Description: AOPC2-SB07-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1545 | Project Name: NASA ARC PFAS | % Solids: 85.4 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2152	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.2		0.98	0.49	0.20	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.23	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.30	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.24	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		80	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		78	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		80	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		85	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-028
Description: AOPC2-SB07-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1545	Project Name: NASA ARC PFAS	% Solids: 85.4 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-029
Description: ERB-071321-S | Matrix: Aqueous
Date Sampled: 07/13/2021 1550 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1526	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		112	50-150
13C2_6:2FTS		128	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		107	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		102	50-150
13C3-HFPO-DA		107	50-150
13C4_PFBA		110	50-150
13C4_PFHpA		112	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		98	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20002-029
Description: ERB-071321-S			Matrix: Aqueous
Date Sampled: 07/13/2021 1550		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		118	50-150
13C8_PFOS		103	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		108	50-150
d5-EtFOSAA		108	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ10065-001
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
11Cl-PF3OUdS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
8:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
6:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
4:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
GenX	2.0	U	1	4.0	2.0	1.0	ug/kg	07/28/2021 1954
ADONA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
EtFOSAA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
MeFOSAA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
PFBS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFDS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFHpS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFNS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFOSA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFPeS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFHxS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFBA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFDoA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFHpA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFHxA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFNA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFOA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFPeA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFTeDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFTrDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFUdA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFOS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		88	50-150
13C2_8:2FTS		84	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		75	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10065-001
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		80	50-150
13C7_PFUdA		83	50-150
13C8_PFOA		84	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10065-002
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	1.9	2.3		1	125	70-130	07/28/2021 2005
11Cl-PF3OUdS	1.9	2.3		1	121	70-130	07/28/2021 2005
8:2 FTS	1.9	2.0		1	106	65-137	07/28/2021 2005
6:2 FTS	1.9	1.7		1	88	64-140	07/28/2021 2005
4:2 FTS	1.9	2.0		1	106	62-145	07/28/2021 2005
GenX	4.0	4.6		1	114	70-150	07/28/2021 2005
ADONA	1.9	2.1		1	114	70-130	07/28/2021 2005
EtFOSAA	2.0	2.3		1	117	61-139	07/28/2021 2005
MeFOSAA	2.0	1.7		1	87	63-144	07/28/2021 2005
PFBS	1.8	1.9		1	111	72-128	07/28/2021 2005
PFDS	1.9	2.4		1	125	59-134	07/28/2021 2005
PFHpS	1.9	2.3		1	124	70-132	07/28/2021 2005
PFNS	1.9	2.4		1	124	69-125	07/28/2021 2005
PFOSA	2.0	2.0		1	102	67-137	07/28/2021 2005
PFPeS	1.9	2.3		1	122	73-123	07/28/2021 2005
PFHxS	1.8	2.0		1	108	67-130	07/28/2021 2005
PFBA	2.0	2.3		1	113	71-135	07/28/2021 2005
PFDA	2.0	2.3		1	114	69-133	07/28/2021 2005
PFDoA	2.0	2.2		1	112	69-135	07/28/2021 2005
PFHpA	2.0	2.2		1	112	71-131	07/28/2021 2005
PFHxA	2.0	2.2		1	111	70-132	07/28/2021 2005
PFNA	2.0	2.1		1	104	72-129	07/28/2021 2005
PFOA	2.0	2.4		1	121	69-133	07/28/2021 2005
PFPeA	2.0	2.2		1	109	69-132	07/28/2021 2005
PFTeDA	2.0	2.3		1	117	69-133	07/28/2021 2005
PFTrDA	2.0	2.6		1	132	66-139	07/28/2021 2005
PFUdA	2.0	2.3		1	113	64-136	07/28/2021 2005
PFOS	1.9	2.2		1	116	68-136	07/28/2021 2005

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		91	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10065-002
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		88	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20002-020MS
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	2.1	2.5		1	116	70-130	07/28/2021 2026
11Cl-PF3OUdS	ND	2.2	2.5		1	115	70-130	07/28/2021 2026
8:2 FTS	ND	2.3	ND	N	1	0.00	65-137	07/28/2021 2026
6:2 FTS	ND	2.2	1.8		1	85	64-140	07/28/2021 2026
4:2 FTS	ND	2.1	2.6		1	121	62-145	07/28/2021 2026
GenX	ND	4.6	4.7		1	103	70-130	07/28/2021 2026
ADONA	ND	2.2	2.3		1	107	70-130	07/28/2021 2026
EtFOSAA	ND	2.3	2.4		1	103	61-139	07/28/2021 2026
MeFOSAA	ND	2.3	2.7		1	116	63-144	07/28/2021 2026
PFBS	ND	2.0	2.6		1	127	72-128	07/28/2021 2026
PFDS	ND	2.2	2.1		1	95	59-134	07/28/2021 2026
PFHpS	ND	2.2	2.3		1	105	70-132	07/28/2021 2026
PFNS	ND	2.2	2.9	N	1	133	69-125	07/28/2021 2026
PFOSA	ND	2.3	2.6		1	113	67-137	07/28/2021 2026
PFPeS	ND	2.1	2.4		1	114	73-123	07/28/2021 2026
PFHxS	ND	2.1	2.5		1	118	67-130	07/28/2021 2026
PFBA	ND	2.3	2.9		1	128	71-135	07/28/2021 2026
PFDA	ND	2.3	2.5		1	111	69-133	07/28/2021 2026
PFDoA	ND	2.3	3.0		1	129	69-135	07/28/2021 2026
PFHpA	ND	2.3	2.5		1	111	71-131	07/28/2021 2026
PFHxA	ND	2.3	2.8		1	123	70-132	07/28/2021 2026
PFNA	ND	2.3	2.7		1	118	72-129	07/28/2021 2026
PFOA	ND	2.3	2.9		1	128	69-133	07/28/2021 2026
PFPeA	ND	2.3	2.7		1	117	69-132	07/28/2021 2026
PFTeDA	ND	2.3	2.5		1	109	69-133	07/28/2021 2026
PFTrDA	ND	2.3	3.3	N	1	144	66-139	07/28/2021 2026
PFUdA	ND	2.3	2.9		1	128	64-136	07/28/2021 2026
PFOS	ND	2.1	2.0		1	95	68-136	07/28/2021 2026

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		84	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20002-020MS
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		87	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20002-020MD
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	2.0	2.1		1	106	17	70-130	30	07/28/2021 2037
11Cl-PF3OUdS	ND	2.0	2.2		1	112	10	70-130	30	07/28/2021 2037
8:2 FTS	ND	2.0	2.2	+	1	107	200	65-137	30	07/28/2021 2037
6:2 FTS	ND	2.0	5.2	N,+	1	260	95	64-140	30	07/28/2021 2037
4:2 FTS	ND	2.0	2.5		1	128	2.8	62-145	30	07/28/2021 2037
GenX	ND	4.2	4.5		1	108	4.0	70-130	30	07/28/2021 2037
ADONA	ND	2.0	2.3		1	115	1.5	70-130	30	07/28/2021 2037
EtFOSAA	ND	2.1	2.3		1	107	4.9	61-139	30	07/28/2021 2037
MeFOSAA	ND	2.1	2.0		1	94	29	63-144	30	07/28/2021 2037
PFBS	ND	1.9	2.2		1	120	14	72-128	30	07/28/2021 2037
PFDS	ND	2.0	2.4		1	118	13	59-134	30	07/28/2021 2037
PFHpS	ND	2.0	2.6		1	131	14	70-132	30	07/28/2021 2037
PFNS	ND	2.0	2.5		1	124	16	69-125	30	07/28/2021 2037
PFOSA	ND	2.1	2.3		1	108	13	67-137	30	07/28/2021 2037
PFPeS	ND	2.0	2.3		1	117	4.5	73-123	30	07/28/2021 2037
PFHxS	ND	1.9	2.2		1	116	9.7	67-130	30	07/28/2021 2037
PFBA	ND	2.1	2.8		1	132	5.5	71-135	30	07/28/2021 2037
PFDA	ND	2.1	2.6		1	123	1.9	69-133	30	07/28/2021 2037
PFDoA	ND	2.1	2.5		1	119	17	69-135	30	07/28/2021 2037
PFHpA	ND	2.1	2.4		1	112	7.3	71-131	30	07/28/2021 2037
PFHxA	ND	2.1	2.5		1	118	12	70-132	30	07/28/2021 2037
PFNA	ND	2.1	2.5		1	117	8.6	72-129	30	07/28/2021 2037
PFOA	ND	2.1	2.6		1	123	12	69-133	30	07/28/2021 2037
PFPeA	ND	2.1	2.5		1	120	5.6	69-132	30	07/28/2021 2037
PFTeDA	ND	2.1	2.3		1	109	8.5	69-133	30	07/28/2021 2037
PFTrDA	ND	2.1	2.7		1	126	22	66-139	30	07/28/2021 2037
PFUdA	ND	2.1	2.5		1	118	17	64-136	30	07/28/2021 2037
PFOS	ND	2.0	2.2		1	110	7.0	68-136	30	07/28/2021 2037

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		82	50-150
13C2_6:2FTS		87	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA		90	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		80	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		75	50-150
13C5_PFPeA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20002-020MD
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		86	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		76	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99902-001
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		84	50-150
13C2_6:2FTS		79	50-150
13C2_8:2FTS		71	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		65	50-150
13C3_PFBS		71	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		75	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99902-001
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		76	50-150
13C7_PFUdA		67	50-150
13C8_PFOA		81	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		78	50-150
13C9_PFNA		77	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99902-002
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	107	70-150	07/25/2021 2318
11Cl-PF3OUdS	15	14		1	95	70-150	07/25/2021 2318
8:2 FTS	15	18		1	118	67-138	07/25/2021 2318
6:2 FTS	15	11		1	75	64-140	07/25/2021 2318
4:2 FTS	15	16		1	107	63-143	07/25/2021 2318
GenX	32	30		1	94	70-150	07/25/2021 2318
ADONA	15	16		1	104	70-150	07/25/2021 2318
EtFOSAA	16	15		1	96	61-135	07/25/2021 2318
MeFOSAA	16	15		1	93	65-136	07/25/2021 2318
PFBS	14	15		1	105	72-130	07/25/2021 2318
PFDS	15	19		1	121	53-142	07/25/2021 2318
PFHpS	15	16		1	104	69-134	07/25/2021 2318
PFNS	15	16		1	101	69-127	07/25/2021 2318
PFOSA	16	16		1	101	67-137	07/25/2021 2318
PFPeS	15	16		1	105	71-127	07/25/2021 2318
PFHxS	15	15		1	101	68-131	07/25/2021 2318
PFBA	16	17		1	105	73-129	07/25/2021 2318
PFDA	16	17		1	109	71-129	07/25/2021 2318
PFDoA	16	18		1	110	72-134	07/25/2021 2318
PFHpA	16	19		1	119	72-130	07/25/2021 2318
PFHxA	16	18		1	113	72-129	07/25/2021 2318
PFNA	16	17		1	105	69-130	07/25/2021 2318
PFOA	16	17		1	108	71-133	07/25/2021 2318
PFPeA	16	16		1	102	72-129	07/25/2021 2318
PFTeDA	16	16		1	102	71-132	07/25/2021 2318
PFTrDA	16	20		1	122	65-144	07/25/2021 2318
PFUdA	16	14		1	90	69-133	07/25/2021 2318
PFOS	15	14		1	94	65-140	07/25/2021 2318

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		89	50-150
13C2_8:2FTS		75	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		73	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99902-002
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	50-150
13C7_PFUdA		80	50-150
13C8_PFOA		87	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99970-001
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
11Cl-PF3OUdS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
8:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
6:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
4:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
GenX	2.0	U	1	4.0	2.0	1.0	ug/kg	07/27/2021 1502
ADONA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
EtFOSAA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
MeFOSAA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
PFBS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFDS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFHpS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFNS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFOSA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFPeS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFHxS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFBA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFDoA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFHpA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFHxA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFNA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFOA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFPeA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFTeDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFTrDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFUdA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFOS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		85	50-150
13C2_6:2FTS		97	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		80	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99970-001
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		84	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99970-002
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	1.9	2.1		1	113	70-130	07/27/2021 1513
11Cl-PF3OUdS	1.9	1.8		1	96	70-130	07/27/2021 1513
8:2 FTS	1.9	2.3		1	122	65-137	07/27/2021 1513
6:2 FTS	1.9	2.1		1	110	64-140	07/27/2021 1513
4:2 FTS	1.9	1.5		1	79	62-145	07/27/2021 1513
GenX	4.0	4.0		1	99	70-150	07/27/2021 1513
ADONA	1.9	2.1		1	110	70-130	07/27/2021 1513
EtFOSAA	2.0	2.1		1	104	61-139	07/27/2021 1513
MeFOSAA	2.0	2.2		1	110	63-144	07/27/2021 1513
PFBS	1.8	1.7		1	94	72-128	07/27/2021 1513
PFDS	1.9	2.2		1	117	59-134	07/27/2021 1513
PFHpS	1.9	2.1		1	110	70-132	07/27/2021 1513
PFNS	1.9	1.9		1	99	69-125	07/27/2021 1513
PFOSA	2.0	1.8		1	90	67-137	07/27/2021 1513
PFPeS	1.9	2.0		1	106	73-123	07/27/2021 1513
PFHxS	1.8	1.8		1	97	67-130	07/27/2021 1513
PFBA	2.0	2.2		1	109	71-135	07/27/2021 1513
PFDA	2.0	2.2		1	109	69-133	07/27/2021 1513
PFDoA	2.0	2.2		1	108	69-135	07/27/2021 1513
PFHpA	2.0	2.1		1	106	71-131	07/27/2021 1513
PFHxA	2.0	2.2		1	110	70-132	07/27/2021 1513
PFNA	2.0	2.0		1	101	72-129	07/27/2021 1513
PFOA	2.0	2.2		1	111	69-133	07/27/2021 1513
PFPeA	2.0	2.2		1	112	69-132	07/27/2021 1513
PFTeDA	2.0	2.2		1	108	69-133	07/27/2021 1513
PFTrDA	2.0	2.3		1	114	66-139	07/27/2021 1513
PFUdA	2.0	2.4		1	119	64-136	07/27/2021 1513
PFOS	1.9	1.7		1	92	68-136	07/27/2021 1513

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99970-002
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	50-150
13C7_PFUdA		80	50-150
13C8_PFOA		80	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		99	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20002-019MS
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	2.3	2.6		1	113	70-130	07/27/2021 2208
11Cl-PF3OUdS	ND	2.3	2.2		1	96	70-130	07/27/2021 2208
8:2 FTS	ND	2.4	2.5		1	105	65-137	07/27/2021 2208
6:2 FTS	ND	2.3	1.1	N	1	48	64-140	07/27/2021 2208
4:2 FTS	ND	2.3	2.3		1	100	62-145	07/27/2021 2208
GenX	ND	5.0	5.6		1	112	70-130	07/27/2021 2208
ADONA	ND	2.3	2.3		1	100	70-130	07/27/2021 2208
EtFOSAA	ND	2.5	2.6		1	106	61-139	07/27/2021 2208
MeFOSAA	ND	2.5	3.0		1	120	63-144	07/27/2021 2208
PFBS	ND	2.2	2.7		1	121	72-128	07/27/2021 2208
PFDS	ND	2.4	2.9		1	123	59-134	07/27/2021 2208
PFHpS	ND	2.4	2.5		1	107	70-132	07/27/2021 2208
PFNS	ND	2.4	2.7		1	113	69-125	07/27/2021 2208
PFOSA	ND	2.5	2.7		1	108	67-137	07/27/2021 2208
PFPeS	ND	2.3	2.7		1	116	73-123	07/27/2021 2208
PFHxS	1.2	2.3	3.6		1	104	67-130	07/27/2021 2208
PFBA	1.1	2.5	3.9		1	110	71-135	07/27/2021 2208
PFDA	ND	2.5	3.0		1	121	69-133	07/27/2021 2208
PFDoA	ND	2.5	3.0		1	122	69-135	07/27/2021 2208
PFHpA	0.45	2.5	3.5		1	123	71-131	07/27/2021 2208
PFHxA	0.86	2.5	3.2		1	96	70-132	07/27/2021 2208
PFNA	0.25	2.5	3.2		1	127	72-129	07/27/2021 2208
PFOA	1.8	2.5	4.7		1	116	69-133	07/27/2021 2208
PFPeA	0.65	2.5	3.1		1	99	69-132	07/27/2021 2208
PFTeDA	ND	2.5	2.7		1	110	69-133	07/27/2021 2208
PFTrDA	ND	2.5	3.1		1	127	66-139	07/27/2021 2208
PFUdA	ND	2.5	2.7		1	108	64-136	07/27/2021 2208
PFOS	4.2	2.3	7.4	N	1	140	68-136	07/27/2021 2208

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	50-150
13C2_6:2FTS		91	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		75	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		77	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		76	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20002-019MS
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		75	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		93	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		75	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20002-019MD
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	2.1	2.3		1	110	11	70-130	30	07/27/2021 2219
11Cl-PF3OUdS	ND	2.1	2.2		1	103	1.1	70-130	30	07/27/2021 2219
8:2 FTS	ND	2.2	2.0		1	90	23	65-137	30	07/27/2021 2219
6:2 FTS	ND	2.2	1.9	+	1	87	50	64-140	30	07/27/2021 2219
4:2 FTS	ND	2.1	2.4		1	113	4.0	62-145	30	07/27/2021 2219
GenX	ND	4.5	4.3		1	95	25	70-130	30	07/27/2021 2219
ADONA	ND	2.1	2.1		1	96	13	70-130	30	07/27/2021 2219
EtFOSAA	ND	2.3	2.1		1	92	23	61-139	30	07/27/2021 2219
MeFOSAA	ND	2.3	2.4		1	108	20	63-144	30	07/27/2021 2219
PFBS	ND	2.0	2.1		1	107	22	72-128	30	07/27/2021 2219
PFDS	ND	2.2	2.7		1	124	6.7	59-134	30	07/27/2021 2219
PFHpS	ND	2.2	2.0		1	93	22	70-132	30	07/27/2021 2219
PFNS	ND	2.2	2.2		1	102	19	69-125	30	07/27/2021 2219
PFOSA	ND	2.3	2.3		1	100	17	67-137	30	07/27/2021 2219
PFPeS	ND	2.1	2.3		1	109	15	73-123	30	07/27/2021 2219
PFHxS	1.2	2.1	2.9		1	81	21	67-130	30	07/27/2021 2219
PFBA	1.1	2.3	3.4		1	100	13	71-135	30	07/27/2021 2219
PFDA	ND	2.3	2.7		1	121	9.0	69-133	30	07/27/2021 2219
PFDoA	ND	2.3	2.6		1	113	16	69-135	30	07/27/2021 2219
PFHpA	0.45	2.3	2.6		1	96	28	71-131	30	07/27/2021 2219
PFHxA	0.86	2.3	2.8		1	87	13	70-132	30	07/27/2021 2219
PFNA	0.25	2.3	2.6		1	116	19	72-129	30	07/27/2021 2219
PFOA	1.8	2.3	4.3		1	107	9.8	69-133	30	07/27/2021 2219
PFPeA	0.65	2.3	2.9		1	100	6.0	69-132	30	07/27/2021 2219
PFTeDA	ND	2.3	2.2		1	96	22	69-133	30	07/27/2021 2219
PFTrDA	ND	2.3	2.5		1	112	21	66-139	30	07/27/2021 2219
PFUdA	ND	2.3	2.6		1	115	2.3	64-136	30	07/27/2021 2219
PFOS	4.2	2.1	5.3	N,+	1	53	33	68-136	30	07/27/2021 2219

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		90	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		80	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20002-019MD
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		81	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		81	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		97	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122961

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x Cam Mma	Analysis (Attach list if more space is needed)	Page 1 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves		WG20002
Project Name: NASA ARC PFAS			KBS2
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G-Grab C-Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	NaOH	HNO3	HCl	NaOH	5035 kit	Field Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC7-SB01-0-0.5	7/13/21	1000	G		x		1							X	
AOPC7-SB01-0.5-2	7/13/21	1005	G		x		1							X	
AOPC7-SB02-0-0.5	7/13/21	1030	G		x		1							X	
AOPC7-SB02-0.5-2	7/13/21	1035	G		x		1							X	
AOPC1-SB01-0-0.5	7/13/21	1100	G		x		1							X	
AOPC1-SB01-0.5-2	7/13/21	1105	G		x		1							X	
AOPC1-SB02-0-0.5	7/13/21	1120	G		x		1							X	
AOPC1-SB02-0.5-2	7/13/21	1125	G		x		1							X	
AOPC1-SB03-0-0.5	7/13/21	1140	G		x		1							X	
AOPC1-SB03-0.5-2	7/13/21	1145	G		x		1							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Cam Mma Tt	7/19/21	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	7/20/21	0955	4. Laboratory received by: [signature]	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on Ice (Circle) Yes No Ice Pack Receipt Temp. 4.7 °C Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122963

| | | |

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122955

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x Callie Neaves	Analysis (Attach list if more space is needed)	Page 3 of 3
City: Oakland / State: CA / Zip Code: 94612	Printed Name: Callie Neaves		
Project Name: NASA ARC PFAs			
Project No.: 103E666601	P.O. No.		

WG20002

KZ52

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Sample Type (G=Grab, C=Composite)	Matrix: Air/Vapor	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	HNO3	HCl	H2SO4	NaOH	ZnAc/NaOH	Other Preserv.	PFAs (Ea.M B-15)	Remarks / Cooler I.D.
AOPC2-SB04-0-0.5	7/13/21	1510	G		X		1							X	
AOPC2-SB04-0.5-2	7/13/21	1515	G		X		1							X	
AOPC2-SB05-0-0.5	7/13/21	1520	G		X		1							X	
AOPC2-SB05-0.5-2	7/13/21	1525	G		X		1							X	
AOPC2-SB06-0-0.5	7/13/21	1530	G		X		1							X	
AOPC2-SB06-0.5-2	7/13/21	1535	G		X		1							X	
AOPC2-SB07-0-0.5	7/13/21	1540	G		X		1							X	
AOPC2-SB07-0.5-2	7/13/21	1545	G		X		1							X	
ERB-071321-S	7/13/21	1550	G	X			2							X	
~~EB~~ CN															

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☐ Standard ☐ Rush (Specify)

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Results Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time
1. Relinquished by: Callie Neaves Tt Cm MM2	7/19/21	0930
2. Relinquished by		
3. Relinquished by		
4. Relinquished by: FedEx	7/20/21	0955
1. Received by		
2. Received by		
3. Received by		
4. Laboratory received by: [signature]	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack — Receipt Temp. 4.7 °C — Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PaceAnalytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: JRG2 / 07/20/2021 Lot #: WO20002

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: 21-1425

4.7 / 4.7 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JRG2 Date: 07/20/2021

Comments:

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dahlquist

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Lot Number:**WG20004**

Date Completed:08/05/2021

08/09/2021 4:24 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Tetra Tech
Lot Number: WG20004

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Samples WG20004-004 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

The laboratory control sample (LCS) for analytical batch 10188 recovered outside acceptance criteria for PFPeS. For the following samples there was an insufficient amount to perform a re-extraction or re-analysis: WG20004-019, WG20004-022, WG20004-023, WG20004-024, WG20004-025. The data has been reported.

The continuing calibration verification (CCV) associated with sample WG20004-013 for analyte(s): GenX recovered above the upper control limit. The sample(s) associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

The continuing calibration verification (CCV) associated with samples WG20004-001, WG20004-002, WG20004-006, WG20004-007, WG20004-008, WG20004-009, WG20004-010, WG20004-011, WG20004-012 for analyte: 8:2 FTS recovered above the upper control limit. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

Surrogate recovery for the following sample(s) was outside control limits: WG20004-014. Re-extraction and/or re-analysis was performed with concurring results. Both sets of data have been reported.

Surrogate recovery for the following samplewas outside of acceptance limits: WG20004-026. There was insufficient sample to perform a re-extraction; therefore, the data have been reported.

Surrogate recovery for the following samples was outside control limits: WG20004-004, WG20004-013. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside the upper control limit: WG20004-011. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

The MS/MSD associated with samples WG20004-001, WG20004-018, WG20004-024 had multiple analytes recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

The method blank associated with batches 10113, 10799 had PFOS detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for PFOS have been flagged with a "B".

Sample Summary

Tetra Tech

Lot Number: WG20004

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC18-11E02A-071221	Aqueous	07/12/2021 1315	07/20/2021
002	AOPC18-WNB-7-071221	Aqueous	07/12/2021 1320	07/20/2021
003	AOPC1-11N21A1-071221	Aqueous	07/12/2021 1520	07/20/2021
004	AOPC8-W11-2-071221	Aqueous	07/12/2021 1610	07/20/2021
005	AOPC6-WV4-18-071221	Aqueous	07/12/2021 1805	07/20/2021
006	FB04-071221	Aqueous	07/12/2021 1700	07/20/2021
007	AOPC25-15H12A-071321	Aqueous	07/13/2021 1245	07/20/2021
008	AOPC25-15B10A-071321	Aqueous	07/13/2021 1315	07/20/2021
009	AOPC24-64A-071321	Aqueous	07/13/2021 1605	07/20/2021
010	AOPC24-WU4-1-071321	Aqueous	07/13/2021 1605	07/20/2021
011	FB-05-071321	Aqueous	07/13/2021 1615	07/20/2021
012	AOPC5-WU4-19-071421	Aqueous	07/14/2021 1135	07/20/2021
013	AOPC5-14039A-071421	Aqueous	07/14/2021 1620	07/20/2021
014	AOPC3-W7-9-071421	Aqueous	07/14/2021 1620	07/20/2021
015	AOPC5-WNB-14-071421	Aqueous	07/14/2021 1820	07/20/2021
016	FB-06-071421	Aqueous	07/14/2021 1830	07/20/2021
017	AOPC1,7-WU4-9-071521	Aqueous	07/15/2021 1230	07/20/2021
018	AOPC1,7-PZA1-5C-071521	Aqueous	07/15/2021 1500	07/20/2021
019	FB-07-071521	Aqueous	07/15/2021 1540	07/20/2021
020	AOPC5-14D12A-071621	Aqueous	07/16/2021 1200	07/20/2021
021	AOPC5-14D12A-071621-FD	Aqueous	07/16/2021 1200	07/20/2021
022	AOPC3-W19-2-071621	Aqueous	07/16/2021 1355	07/20/2021
023	AOPC3-W7-10-071621	Aqueous	07/16/2021 1520	07/20/2021
024	AOPC24-171A-071621	Aqueous	07/16/2021 1630	07/20/2021
025	FB-08-071621	Aqueous	07/16/2021 1610	07/20/2021
026	FB-07-071621	Aqueous	07/15/2021 1600	07/20/2021

(26 samples)

Detection Summary

Tetra Tech

Lot Number: WG20004

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	AOPC18-11E02A-071221	Aqueous	6:2 FTS	PFAS by ID	47		ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFBS	PFAS by ID	18		ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFHpS	PFAS by ID	4.2		ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFPeS	PFAS by ID	12		ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFHxS	PFAS by ID	120		ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFBA	PFAS by ID	73	S	ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFHpA	PFAS by ID	42		ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFHxA	PFAS by ID	240	S	ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFNA	PFAS by ID	2.9	J	ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFOA	PFAS by ID	34		ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFPeA	PFAS by ID	230	S	ng/L	11
001	AOPC18-11E02A-071221	Aqueous	PFOS	PFAS by ID	470	S	ng/L	11
002	AOPC18-WNB-7-071221	Aqueous	6:2 FTS	PFAS by ID	58		ng/L	13
002	AOPC18-WNB-7-071221	Aqueous	PFBS	PFAS by ID	12		ng/L	13
002	AOPC18-WNB-7-071221	Aqueous	PFPeS	PFAS by ID	8.3		ng/L	13
002	AOPC18-WNB-7-071221	Aqueous	PFHxS	PFAS by ID	32		ng/L	13
002	AOPC18-WNB-7-071221	Aqueous	PFBA	PFAS by ID	12		ng/L	13
002	AOPC18-WNB-7-071221	Aqueous	PFHxA	PFAS by ID	2.2	J	ng/L	13
002	AOPC18-WNB-7-071221	Aqueous	PFOA	PFAS by ID	1.6	J	ng/L	13
002	AOPC18-WNB-7-071221	Aqueous	PFPeA	PFAS by ID	1.8	J	ng/L	13
002	AOPC18-WNB-7-071221	Aqueous	PFOS	PFAS by ID	55		ng/L	13
003	AOPC1-11N21A1-071221	Aqueous	6:2 FTS	PFAS by ID	260	J	ng/L	15
003	AOPC1-11N21A1-071221	Aqueous	PFBS	PFAS by ID	520		ng/L	15
003	AOPC1-11N21A1-071221	Aqueous	PFHpS	PFAS by ID	200		ng/L	15
003	AOPC1-11N21A1-071221	Aqueous	PFPeS	PFAS by ID	490		ng/L	15
003	AOPC1-11N21A1-071221	Aqueous	PFHxS	PFAS by ID	3300		ng/L	15
003	AOPC1-11N21A1-071221	Aqueous	PFBA	PFAS by ID	190		ng/L	15
003	AOPC1-11N21A1-071221	Aqueous	PFHpA	PFAS by ID	160	J	ng/L	15
003	AOPC1-11N21A1-071221	Aqueous	PFHxA	PFAS by ID	900		ng/L	15
003	AOPC1-11N21A1-071221	Aqueous	PFOA	PFAS by ID	350		ng/L	15
003	AOPC1-11N21A1-071221	Aqueous	PFPeA	PFAS by ID	340		ng/L	15
003	AOPC1-11N21A1-071221	Aqueous	PFOS	PFAS by ID	7700		ng/L	15
004	AOPC8-W11-2-071221	Aqueous	6:2 FTS	PFAS by ID	50		ng/L	17
004	AOPC8-W11-2-071221	Aqueous	PFBS	PFAS by ID	5.8		ng/L	17
004	AOPC8-W11-2-071221	Aqueous	PFHxS	PFAS by ID	16		ng/L	17
004	AOPC8-W11-2-071221	Aqueous	PFBA	PFAS by ID	48		ng/L	17
004	AOPC8-W11-2-071221	Aqueous	PFHpA	PFAS by ID	7.9		ng/L	17
004	AOPC8-W11-2-071221	Aqueous	PFHxA	PFAS by ID	8.4		ng/L	17
004	AOPC8-W11-2-071221	Aqueous	PFOA	PFAS by ID	110		ng/L	17
004	AOPC8-W11-2-071221	Aqueous	PFPeA	PFAS by ID	7.6		ng/L	17
004	AOPC8-W11-2-071221	Aqueous	PFOS	PFAS by ID	3.0	J	ng/L	17
005	AOPC6-WV4-18-071221	Aqueous	8:2 FTS	PFAS by ID	20	J	ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	6:2 FTS	PFAS by ID	330		ng/L	19

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
005	AOPC6-WV4-18-071221	Aqueous	PFBS	PFAS by ID	490		ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	PFHpS	PFAS by ID	91		ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	PFPeS	PFAS by ID	350		ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	PFHxS	PFAS by ID	1600		ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	PFBA	PFAS by ID	150		ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	PFHpA	PFAS by ID	130		ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	PFHxA	PFAS by ID	720		ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	PFNA	PFAS by ID	14	J	ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	PFOA	PFAS by ID	170		ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	PFPeA	PFAS by ID	320		ng/L	19
005	AOPC6-WV4-18-071221	Aqueous	PFOS	PFAS by ID	3300		ng/L	19
007	AOPC25-15H12A-071321	Aqueous	6:2 FTS	PFAS by ID	540		ng/L	23
007	AOPC25-15H12A-071321	Aqueous	PFBS	PFAS by ID	5.7		ng/L	23
007	AOPC25-15H12A-071321	Aqueous	PFPeS	PFAS by ID	1.9	J	ng/L	23
007	AOPC25-15H12A-071321	Aqueous	PFHxS	PFAS by ID	12		ng/L	23
007	AOPC25-15H12A-071321	Aqueous	PFBA	PFAS by ID	3.3	J	ng/L	23
007	AOPC25-15H12A-071321	Aqueous	PFHpA	PFAS by ID	1.0	J	ng/L	23
007	AOPC25-15H12A-071321	Aqueous	PFHxA	PFAS by ID	2.0	J	ng/L	23
007	AOPC25-15H12A-071321	Aqueous	PFOA	PFAS by ID	2.2	J	ng/L	23
007	AOPC25-15H12A-071321	Aqueous	PFPeA	PFAS by ID	1.8	J	ng/L	23
007	AOPC25-15H12A-071321	Aqueous	PFOS	PFAS by ID	9.0		ng/L	23
008	AOPC25-15B10A-071321	Aqueous	PFBS	PFAS by ID	4.4		ng/L	25
008	AOPC25-15B10A-071321	Aqueous	PFPeS	PFAS by ID	1.6	J	ng/L	25
008	AOPC25-15B10A-071321	Aqueous	PFHxS	PFAS by ID	8.6		ng/L	25
008	AOPC25-15B10A-071321	Aqueous	PFBA	PFAS by ID	2.8	J	ng/L	25
008	AOPC25-15B10A-071321	Aqueous	PFHxA	PFAS by ID	1.6	J	ng/L	25
008	AOPC25-15B10A-071321	Aqueous	PFOA	PFAS by ID	1.2	J	ng/L	25
008	AOPC25-15B10A-071321	Aqueous	PFPeA	PFAS by ID	1.8	J	ng/L	25
008	AOPC25-15B10A-071321	Aqueous	PFOS	PFAS by ID	4.3		ng/L	25
009	AOPC24-64A-071321	Aqueous	6:2 FTS	PFAS by ID	9.6		ng/L	27
009	AOPC24-64A-071321	Aqueous	PFBS	PFAS by ID	5.7		ng/L	27
009	AOPC24-64A-071321	Aqueous	PFPeS	PFAS by ID	2.7	J	ng/L	27
009	AOPC24-64A-071321	Aqueous	PFHxS	PFAS by ID	11		ng/L	27
009	AOPC24-64A-071321	Aqueous	PFBA	PFAS by ID	1.5	J	ng/L	27
009	AOPC24-64A-071321	Aqueous	PFPeA	PFAS by ID	1.1	J	ng/L	27
009	AOPC24-64A-071321	Aqueous	PFOS	PFAS by ID	3.8		ng/L	27
010	AOPC24-WU4-1-071321	Aqueous	6:2 FTS	PFAS by ID	4.9	J	ng/L	29
010	AOPC24-WU4-1-071321	Aqueous	PFBS	PFAS by ID	8.4		ng/L	29
010	AOPC24-WU4-1-071321	Aqueous	PFPeS	PFAS by ID	6.4		ng/L	29
010	AOPC24-WU4-1-071321	Aqueous	PFHxS	PFAS by ID	25		ng/L	29
010	AOPC24-WU4-1-071321	Aqueous	PFBA	PFAS by ID	5.0		ng/L	29
010	AOPC24-WU4-1-071321	Aqueous	PFHpA	PFAS by ID	1.6	J	ng/L	29
010	AOPC24-WU4-1-071321	Aqueous	PFHxA	PFAS by ID	7.2		ng/L	29
010	AOPC24-WU4-1-071321	Aqueous	PFOA	PFAS by ID	3.3	J	ng/L	29
010	AOPC24-WU4-1-071321	Aqueous	PFPeA	PFAS by ID	4.9		ng/L	29
010	AOPC24-WU4-1-071321	Aqueous	PFOS	PFAS by ID	8.0		ng/L	29
012	AOPC5-WU4-19-071421	Aqueous	6:2 FTS	PFAS by ID	620		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFBS	PFAS by ID	1500		ng/L	33

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
012	AOPC5-WU4-19-071421	Aqueous	PFHpS	PFAS by ID	170		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFOSA	PFAS by ID	2.7	J	ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFPeS	PFAS by ID	1200		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFHxS	PFAS by ID	4400		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFBA	PFAS by ID	260		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFDA	PFAS by ID	4.2		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFHpA	PFAS by ID	230		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFHxA	PFAS by ID	1300		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFNA	PFAS by ID	7.6		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFOA	PFAS by ID	330		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFPeA	PFAS by ID	370		ng/L	33
012	AOPC5-WU4-19-071421	Aqueous	PFOS	PFAS by ID	3300		ng/L	33
013	AOPC5-14039A-071421	Aqueous	8:2 FTS	PFAS by ID	27		ng/L	35
013	AOPC5-14039A-071421	Aqueous	6:2 FTS	PFAS by ID	480		ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFBS	PFAS by ID	310		ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFHpS	PFAS by ID	720	Q	ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFNS	PFAS by ID	50	Q	ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFOSA	PFAS by ID	23		ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFPeS	PFAS by ID	330		ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFBA	PFAS by ID	270		ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFDA	PFAS by ID	2.7	J	ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFHpA	PFAS by ID	130		ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFNA	PFAS by ID	8.7	Q	ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFOA	PFAS by ID	250		ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFPeA	PFAS by ID	560		ng/L	35
013	AOPC5-14039A-071421	Aqueous	PFHxS	PFAS by ID	3900		ng/L	37
013	AOPC5-14039A-071421	Aqueous	PFHxA	PFAS by ID	1600		ng/L	37
013	AOPC5-14039A-071421	Aqueous	PFOS	PFAS by ID	40000	B	ng/L	37
014	AOPC3-W7-9-071421	Aqueous	6:2 FTS	PFAS by ID	14	Q	ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFBS	PFAS by ID	14		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFHpS	PFAS by ID	4.9		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFPeS	PFAS by ID	19		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFHxS	PFAS by ID	180		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFBA	PFAS by ID	45		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFDA	PFAS by ID	5.5		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFHpA	PFAS by ID	51		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFHxA	PFAS by ID	54		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFNA	PFAS by ID	11		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFOA	PFAS by ID	62		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFPeA	PFAS by ID	56		ng/L	39
014	AOPC3-W7-9-071421	Aqueous	PFOS	PFAS by ID	160	B	ng/L	39
015	AOPC5-WNB-14-071421	Aqueous	8:2 FTS	PFAS by ID	18		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	6:2 FTS	PFAS by ID	130		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFBS	PFAS by ID	29		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFHpS	PFAS by ID	7.2		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFPeS	PFAS by ID	25		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFHxS	PFAS by ID	220		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFBA	PFAS by ID	150		ng/L	43

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
015	AOPC5-WNB-14-071421	Aqueous	PFDA	PFAS by ID	8.7		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFDoA	PFAS by ID	1.3	J	ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFHpA	PFAS by ID	190		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFHxA	PFAS by ID	550		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFNA	PFAS by ID	27		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFOA	PFAS by ID	120		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFPeA	PFAS by ID	540		ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFUdA	PFAS by ID	2.2	J	ng/L	43
015	AOPC5-WNB-14-071421	Aqueous	PFOS	PFAS by ID	410	B	ng/L	43
016	FB-06-071421	Aqueous	PFOS	PFAS by ID	3.9	B	ng/L	45
017	AOPC1,7-WU4-9-071521	Aqueous	6:2 FTS	PFAS by ID	91		ng/L	47
017	AOPC1,7-WU4-9-071521	Aqueous	PFBS	PFAS by ID	7.1		ng/L	47
017	AOPC1,7-WU4-9-071521	Aqueous	PFPeS	PFAS by ID	7.8		ng/L	47
017	AOPC1,7-WU4-9-071521	Aqueous	PFHxS	PFAS by ID	34		ng/L	47
017	AOPC1,7-WU4-9-071521	Aqueous	PFBA	PFAS by ID	4.2		ng/L	47
017	AOPC1,7-WU4-9-071521	Aqueous	PFHpA	PFAS by ID	2.1	J	ng/L	47
017	AOPC1,7-WU4-9-071521	Aqueous	PFHxA	PFAS by ID	6.0		ng/L	47
017	AOPC1,7-WU4-9-071521	Aqueous	PFOA	PFAS by ID	5.1		ng/L	47
017	AOPC1,7-WU4-9-071521	Aqueous	PFPeA	PFAS by ID	4.7		ng/L	47
017	AOPC1,7-WU4-9-071521	Aqueous	PFOS	PFAS by ID	18	B	ng/L	47
018	AOPC1,7-PZA1-5C-071521	Aqueous	PFBS	PFAS by ID	21	S	ng/L	49
018	AOPC1,7-PZA1-5C-071521	Aqueous	PFHpS	PFAS by ID	2.4	J	ng/L	49
018	AOPC1,7-PZA1-5C-071521	Aqueous	PFPeS	PFAS by ID	27		ng/L	49
018	AOPC1,7-PZA1-5C-071521	Aqueous	PFHxS	PFAS by ID	250	S	ng/L	49
018	AOPC1,7-PZA1-5C-071521	Aqueous	PFBA	PFAS by ID	13		ng/L	49
018	AOPC1,7-PZA1-5C-071521	Aqueous	PFHpA	PFAS by ID	7.4		ng/L	49
018	AOPC1,7-PZA1-5C-071521	Aqueous	PFHxA	PFAS by ID	22		ng/L	49
018	AOPC1,7-PZA1-5C-071521	Aqueous	PFOA	PFAS by ID	38		ng/L	49
018	AOPC1,7-PZA1-5C-071521	Aqueous	PFPeA	PFAS by ID	17		ng/L	49
018	AOPC1,7-PZA1-5C-071521	Aqueous	PFOS	PFAS by ID	110	B	ng/L	49
019	FB-07-071521	Aqueous	6:2 FTS	PFAS by ID	12		ng/L	51
020	AOPC5-14D12A-071621	Aqueous	6:2 FTS	PFAS by ID	6.2	J	ng/L	53
020	AOPC5-14D12A-071621	Aqueous	PFBS	PFAS by ID	11		ng/L	53
020	AOPC5-14D12A-071621	Aqueous	PFPeS	PFAS by ID	5.1		ng/L	53
020	AOPC5-14D12A-071621	Aqueous	PFHxS	PFAS by ID	24		ng/L	53
020	AOPC5-14D12A-071621	Aqueous	PFBA	PFAS by ID	9.2		ng/L	53
020	AOPC5-14D12A-071621	Aqueous	PFHpA	PFAS by ID	3.0	J	ng/L	53
020	AOPC5-14D12A-071621	Aqueous	PFHxA	PFAS by ID	7.7		ng/L	53
020	AOPC5-14D12A-071621	Aqueous	PFNA	PFAS by ID	6.6		ng/L	53
020	AOPC5-14D12A-071621	Aqueous	PFOA	PFAS by ID	8.3		ng/L	53
020	AOPC5-14D12A-071621	Aqueous	PFPeA	PFAS by ID	8.3		ng/L	53
020	AOPC5-14D12A-071621	Aqueous	PFOS	PFAS by ID	14		ng/L	53
021	AOPC5-14D12A-071621-FD	Aqueous	6:2 FTS	PFAS by ID	5.6	J	ng/L	55
021	AOPC5-14D12A-071621-FD	Aqueous	PFBS	PFAS by ID	12		ng/L	55
021	AOPC5-14D12A-071621-FD	Aqueous	PFPeS	PFAS by ID	5.3		ng/L	55
021	AOPC5-14D12A-071621-FD	Aqueous	PFHxS	PFAS by ID	25		ng/L	55
021	AOPC5-14D12A-071621-FD	Aqueous	PFBA	PFAS by ID	9.7		ng/L	55
021	AOPC5-14D12A-071621-FD	Aqueous	PFHpA	PFAS by ID	2.5	J	ng/L	55

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
021	AOPC5-14D12A-071621-FD	Aqueous	PFHxA	PFAS by ID	7.6		ng/L	55
021	AOPC5-14D12A-071621-FD	Aqueous	PFNA	PFAS by ID	7.5		ng/L	55
021	AOPC5-14D12A-071621-FD	Aqueous	PFOA	PFAS by ID	8.3		ng/L	55
021	AOPC5-14D12A-071621-FD	Aqueous	PFPeA	PFAS by ID	8.6		ng/L	55
021	AOPC5-14D12A-071621-FD	Aqueous	PFOS	PFAS by ID	16		ng/L	55
022	AOPC3-W19-2-071621	Aqueous	6:2 FTS	PFAS by ID	2.0	J	ng/L	57
022	AOPC3-W19-2-071621	Aqueous	PFHxS	PFAS by ID	8.1		ng/L	57
022	AOPC3-W19-2-071621	Aqueous	PFBA	PFAS by ID	1.4	J	ng/L	57
022	AOPC3-W19-2-071621	Aqueous	PFHxA	PFAS by ID	1.1	J	ng/L	57
022	AOPC3-W19-2-071621	Aqueous	PFOA	PFAS by ID	4.1		ng/L	57
022	AOPC3-W19-2-071621	Aqueous	PFOS	PFAS by ID	2.3	J	ng/L	57
023	AOPC3-W7-10-071621	Aqueous	6:2 FTS	PFAS by ID	12		ng/L	59
023	AOPC3-W7-10-071621	Aqueous	PFBS	PFAS by ID	0.87	J	ng/L	59
023	AOPC3-W7-10-071621	Aqueous	PFHxS	PFAS by ID	10		ng/L	59
023	AOPC3-W7-10-071621	Aqueous	PFBA	PFAS by ID	2.0	J	ng/L	59
023	AOPC3-W7-10-071621	Aqueous	PFHpA	PFAS by ID	1.4	J	ng/L	59
023	AOPC3-W7-10-071621	Aqueous	PFHxA	PFAS by ID	1.0	J	ng/L	59
023	AOPC3-W7-10-071621	Aqueous	PFOA	PFAS by ID	4.6		ng/L	59
023	AOPC3-W7-10-071621	Aqueous	PFOS	PFAS by ID	57		ng/L	59
024	AOPC24-171A-071621	Aqueous	PFBS	PFAS by ID	6.2		ng/L	61
024	AOPC24-171A-071621	Aqueous	PFPeS	PFAS by ID	2.0	JL	ng/L	61
024	AOPC24-171A-071621	Aqueous	PFHxS	PFAS by ID	7.0		ng/L	61
024	AOPC24-171A-071621	Aqueous	PFBA	PFAS by ID	4.4		ng/L	61
024	AOPC24-171A-071621	Aqueous	PFHxA	PFAS by ID	1.5	J	ng/L	61
024	AOPC24-171A-071621	Aqueous	PFOA	PFAS by ID	2.7	J	ng/L	61
024	AOPC24-171A-071621	Aqueous	PFPeA	PFAS by ID	1.7	J	ng/L	61
024	AOPC24-171A-071621	Aqueous	PFOS	PFAS by ID	4.2		ng/L	61

(214 detections)

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-001
Description: AOPC18-11E02A-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1315
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1536	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	47		7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	18		3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	4.2		3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	12		3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	120		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	73	S	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	42		3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	240	S	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.9	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	34		3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	230	S	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	470	S	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		129	50-150
13C2_6:2FTS		144	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		105	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		103	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		97	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-001
Description: AOPC18-11E02A-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1315
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		113	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		106	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		109	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-002
Description: AOPC18-WNB-7-071221 | Matrix: Aqueous
Date Sampled: 07/12/2021 1320 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1557	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	58		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	12		3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	8.3		3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	32		3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.2	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.6	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	55		3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		114	50-150
13C2_6:2FTS		127	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA		80	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		80	50-150
13C7_PFUdA		100	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-002
Description: AOPC18-WNB-7-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1320
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-003
Description: AOPC1-11N21A1-071221 | Matrix: Aqueous
Date Sampled: 07/12/2021 1520 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	50	07/27/2021 1440	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	180	U	360	180	91	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	180	U	360	180	91	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	180	U	360	180	91	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	260	J	360	180	91	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	180	U	360	180	91	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	180	U	360	180	91	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	180	U	360	180	91	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	180	U	360	180	91	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	180	U	360	180	91	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	520		180	90	45	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	200		180	90	45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	490		180	90	45	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3300		180	90	45	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	190		180	90	45	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	160	J	180	90	45	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	900		180	90	45	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	350		180	90	45	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	340		180	90	45	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	7700		180	90	45	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		96	50-150
13C2_6:2FTS		115	50-150
13C2_8:2FTS		102	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		94	50-150
13C3_PFBS		106	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		103	50-150
13C5_PFPeA		95	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		108	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-003
Description: AOPC1-11N21A1-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1520
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		99	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-004
Description: AOPC8-W11-2-071221 | Matrix: Aqueous
Date Sampled: 07/12/2021 1610 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1451	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	50		8.4	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	UQ	8.4	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	UQ	8.4	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	UQ	8.4	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.8		4.2	2.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	16		4.2	2.1	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	48		4.2	2.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	7.9		4.2	2.1	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	8.4		4.2	2.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	110		4.2	2.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	7.6		4.2	2.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.0	J	4.2	2.1	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	152	50-150
13C2_6:2FTS		123	50-150
13C2_8:2FTS		66	50-150
13C2_PFDoA		54	50-150
13C2_PFTeDA		54	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		69	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		81	50-150
13C6_PFDA		70	50-150
13C7_PFUdA		64	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-004
Description: AOPC8-W11-2-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1610
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	50-150
13C8_PFOS		60	50-150
13C8_PFOSA		72	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA	N	40	50-150
d3-MeFOSAA	N	47	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-005
Description: AOPC6-WV4-18-071221 | Matrix: Aqueous
Date Sampled: 07/12/2021 1805 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	10	07/27/2021 1501	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	37	U	74	37	19	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	37	U	74	37	19	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	20	J	74	37	19	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	330		74	37	19	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	37	U	74	37	19	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	37	U	74	37	19	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	37	U	74	37	19	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	37	U	74	37	19	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	37	U	74	37	19	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	490		37	19	9.3	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	91		37	19	9.3	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	350		37	19	9.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1600		37	19	9.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	150		37	19	9.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	130		37	19	9.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	720		37	19	9.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	14	J	37	19	9.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	170		37	19	9.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	320		37	19	9.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3300		37	19	9.3	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		101	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		127	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		98	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		104	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-005
Description: AOPC6-WV4-18-071221			Matrix: Aqueous
Date Sampled: 07/12/2021 1805		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		91	50-150
13C8_PFOSA		102	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-006
Description: FB04-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1700
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1712	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		100	50-150
13C2_6:2FTS		145	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		93	50-150
13C7_PFUdA		98	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-006
Description: FB04-071221			Matrix: Aqueous
Date Sampled: 07/12/2021 1700		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		116	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-007
Description: AOPC25-15H12A-071321 | Matrix: Aqueous
Date Sampled: 07/13/2021 1245 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1722	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	540		8.3	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.7		4.2	2.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	J	4.2	2.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	12		4.2	2.1	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.3	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.0	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.2	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.0		4.2	2.1	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		127	50-150
13C2_6:2FTS		135	50-150
13C2_8:2FTS		124	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		94	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		106	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBA		124	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		113	50-150
13C5_PFPeA		113	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		101	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-007
Description: AOPC25-15H12A-071321
Matrix: Aqueous
Date Sampled: 07/13/2021 1245
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		116	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		113	50-150
13C9_PFNA		111	50-150
d5-EtFOSAA		104	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-008
Description: AOPC25-15B10A-071321 | Matrix: Aqueous
Date Sampled: 07/13/2021 1315 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1733	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	4.4		3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.6	J	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	8.6		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.8	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.6	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.2	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.3		3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		117	50-150
13C2_6:2FTS		129	50-150
13C2_8:2FTS		118	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		109	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		107	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		119	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		98	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-008
Description: AOPC25-15B10A-071321
Matrix: Aqueous
Date Sampled: 07/13/2021 1315
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	50-150
13C8_PFOS		96	50-150
13C8_PFOSA		104	50-150
13C9_PFNA		100	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-009
Description: AOPC24-64A-071321 | Matrix: Aqueous
Date Sampled: 07/13/2021 1605 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1744	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	9.6		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.7		3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.7	J	3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	11		3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.5	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.8		3.8	1.9	0.96	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		118	50-150
13C2_6:2FTS		131	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		113	50-150
13C4_PFBA		107	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		94	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-009
Description: AOPC24-64A-071321			Matrix: Aqueous
Date Sampled: 07/13/2021 1605		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	50-150
13C8_PFOS		91	50-150
13C8_PFOSA		97	50-150
13C9_PFNA		114	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-010
Description: AOPC24-WU4-1-071321 | Matrix: Aqueous
Date Sampled: 07/13/2021 1605 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1754	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.9	J	8.8	4.4	2.2	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.4		4.4	2.2	1.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	6.4		4.4	2.2	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	25		4.4	2.2	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	5.0		4.4	2.2	1.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.6	J	4.4	2.2	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.2		4.4	2.2	1.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.3	J	4.4	2.2	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.9		4.4	2.2	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	8.0		4.4	2.2	1.1	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		105	50-150
13C2_6:2FTS		141	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		102	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		108	50-150
13C4_PFBA		108	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		108	50-150
13C5_PFPeA		107	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		104	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-010
Description: AOPC24-WU4-1-071321			Matrix: Aqueous
Date Sampled: 07/13/2021 1605		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		113	50-150
13C8_PFOS		93	50-150
13C8_PFOSA		124	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		115	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-011
Description: FB-05-071321
Matrix: Aqueous
Date Sampled: 07/13/2021 1615
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1805	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		101	50-150
13C2_6:2FTS	N	153	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		116	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		105	50-150
13C5_PFHxA		103	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		95	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-011
Description: FB-05-071321			Matrix: Aqueous
Date Sampled: 07/13/2021 1615		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		117	50-150
13C8_PFOS		90	50-150
13C8_PFOSA		111	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-012
Description: AOPC5-WU4-19-071421 | Matrix: Aqueous
Date Sampled: 07/14/2021 1135 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1815	MMM	07/23/2021 1742	99902
2	SOP SPE	PFAS by ID SOP QSM B-15	10	07/27/2021 1512	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	620		6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1500		34	17	8.6	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	170		3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.7	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1200		34	17	8.6	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4400		34	17	8.6	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	260		3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	4.2		3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	230		3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1300		34	17	8.6	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	7.6		3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	330		3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	370		3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3300		34	17	8.6	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		144	50-150		98	50-150
13C2_6:2FTS		116	50-150		105	50-150
13C2_8:2FTS		112	50-150		106	50-150
13C2_PFDoA		81	50-150		98	50-150
13C2_PFTeDA		73	50-150		93	50-150
13C3_PFBS		86	50-150		96	50-150
13C3_PFHxS		68	50-150		90	50-150
13C3-HFPO-DA		95	50-150		97	50-150
13C4_PFBA		108	50-150		103	50-150
13C4_PFHpA		83	50-150		95	50-150
13C5_PFHxA		96	50-150		98	50-150
13C5_PFPeA		100	50-150		88	50-150
13C6_PFDA		102	50-150		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-012
Description: AOPC5-WU4-19-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1135
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		93	50-150		100	50-150
13C8_PFOA		101	50-150		92	50-150
13C8_PFOS		79	50-150		91	50-150
13C8_PFOSA		105	50-150		104	50-150
13C9_PFNA		85	50-150		95	50-150
d5-EtFOSAA		97	50-150		90	50-150
d3-MeFOSAA		96	50-150		104	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-013

Description: AOPC5-14039A-071421 | Matrix: Aqueous

Date Sampled: 07/14/2021 1620 | Project Name: NASA ARC PFAS

Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2052	MMM	07/27/2021 1332	10113
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/03/2021 1036	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	27		7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	480		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	310		3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	UQ	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	720	Q	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	50	Q	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	23		3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	330		3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4700	EQ	3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	270		3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.7	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	130		3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1400	E	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	8.7	Q	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	250		3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	560		3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	68000	BEQ	3.9	2.0	0.97	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	248	50-150		107	50-150
13C2_6:2FTS		148	50-150		109	50-150
13C2_8:2FTS		108	50-150		117	50-150
13C2_PFDoA		71	50-150		101	50-150
13C2_PFTeDA		76	50-150		109	50-150
13C3_PFBS		81	50-150		117	50-150
13C3_PFHxS	N	49	50-150		104	50-150
13C3-HFPO-DA		63	50-150		108	50-150
13C4_PFBA		64	50-150		113	50-150
13C4_PFHpA		68	50-150		112	50-150
13C5_PFHxA		77	50-150		100	50-150
13C5_PFPeA		71	50-150		100	50-150
13C6_PFDA		89	50-150		100	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-013
Description: AOPC5-14039A-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	50-150		116	50-150
13C8_PFOA		81	50-150		110	50-150
13C8_PFOS	N	24	50-150		107	50-150
13C8_PFOSA		78	50-150		124	50-150
13C9_PFNA	N	28	50-150		105	50-150
d5-EtFOSAA		77	50-150		112	50-150
d3-MeFOSAA		92	50-150		111	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-013
Description: AOPC5-14039A-071421 | Matrix: Aqueous
Date Sampled: 07/14/2021 1620 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2052	MMM	07/27/2021 1332	10113
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/03/2021 1036	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	390	U	770	390	190	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	390	U	770	390	190	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	390	U	770	390	190	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	390	U	770	390	190	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	390	U	770	390	190	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	390	U	770	390	190	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	390	U	770	390	190	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	390	U	770	390	190	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	390	U	770	390	190	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	260	J	390	200	97	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	380	J	390	200	97	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	300	J	390	200	97	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3900		390	200	97	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	160	J	390	200	97	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	100	J	390	200	97	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1600		390	200	97	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	220	J	390	200	97	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	500		390	200	97	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	40000	B	390	200	97	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	248	50-150		107	50-150
13C2_6:2FTS		148	50-150		109	50-150
13C2_8:2FTS		108	50-150		117	50-150
13C2_PFDoA		71	50-150		101	50-150
13C2_PFTeDA		76	50-150		109	50-150
13C3_PFBS		81	50-150		117	50-150
13C3_PFHxS	N	49	50-150		104	50-150
13C3-HFPO-DA		63	50-150		108	50-150
13C4_PFBA		64	50-150		113	50-150
13C4_PFHpA		68	50-150		112	50-150
13C5_PFHxA		77	50-150		100	50-150
13C5_PFPeA		71	50-150		100	50-150
13C6_PFDA		89	50-150		100	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-013
Description: AOPC5-14039A-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	50-150		116	50-150
13C8_PFOA		81	50-150		110	50-150
13C8_PFOS	N	24	50-150		107	50-150
13C8_PFOSA		78	50-150		124	50-150
13C9_PFNA	N	28	50-150		105	50-150
d5-EtFOSAA		77	50-150		112	50-150
d3-MeFOSAA		92	50-150		111	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-014

Description: AOPC3-W7-9-071421 | Matrix: Aqueous

Date Sampled: 07/14/2021 1620 | Project Name: NASA ARC PFAS

Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 0027	MMM	07/27/2021 1332	10113
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1436	SES	08/02/2021 1842	10799

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	14	Q	8.4	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	UQ	8.4	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	14		4.2	2.1	1.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	4.9		4.2	2.1	1.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	19		4.2	2.1	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	180		4.2	2.1	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	45		4.2	2.1	1.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	5.5		4.2	2.1	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	51		4.2	2.1	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	54		4.2	2.1	1.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	11		4.2	2.1	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	62		4.2	2.1	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	56		4.2	2.1	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	160	B	4.2	2.1	1.1	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	277	50-150	N	186	50-150
13C2_6:2FTS	N	203	50-150		142	50-150
13C2_8:2FTS		125	50-150		93	50-150
13C2_PFDoA		55	50-150		68	50-150
13C2_PFTeDA		56	50-150		69	50-150
13C3_PFBS		70	50-150		72	50-150
13C3_PFHxS		73	50-150		71	50-150
13C3-HFPO-DA		75	50-150		83	50-150
13C4_PFBA		56	50-150		67	50-150
13C4_PFHpA		84	50-150		88	50-150
13C5_PFHxA		68	50-150		76	50-150
13C5_PFPeA		69	50-150		74	50-150
13C6_PFDA		88	50-150		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-014
Description: AOPC3-W7-9-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	50-150		81	50-150
13C8_PFOA		87	50-150		88	50-150
13C8_PFOS		70	50-150		72	50-150
13C8_PFOSA		84	50-150		75	50-150
13C9_PFNA		84	50-150		81	50-150
d5-EtFOSAA		80	50-150		78	50-150
d3-MeFOSAA		88	50-150		80	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-014
Description: AOPC3-W7-9-071421 | Matrix: Aqueous
Date Sampled: 07/14/2021 1620 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 0027	MMM	07/27/2021 1332	10113
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1436	SES	08/02/2021 1842	10799

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	11		8.3	4.2	2.1	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	UQ	8.3	4.2	2.1	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	14		4.2	2.1	1.0	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	4.4		4.2	2.1	1.0	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	18		4.2	2.1	1.0	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	180		4.2	2.1	1.0	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	48		4.2	2.1	1.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	5.8		4.2	2.1	1.0	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	52		4.2	2.1	1.0	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	53		4.2	2.1	1.0	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	11		4.2	2.1	1.0	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	67		4.2	2.1	1.0	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	51		4.2	2.1	1.0	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	150		4.2	2.1	1.0	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	277	50-150	N	186	50-150
13C2_6:2FTS	N	203	50-150		142	50-150
13C2_8:2FTS		125	50-150		93	50-150
13C2_PFDoA		55	50-150		68	50-150
13C2_PFTeDA		56	50-150		69	50-150
13C3_PFBS		70	50-150		72	50-150
13C3_PFHxS		73	50-150		71	50-150
13C3-HFPO-DA		75	50-150		83	50-150
13C4_PFBA		56	50-150		67	50-150
13C4_PFHpA		84	50-150		88	50-150
13C5_PFHxA		68	50-150		76	50-150
13C5_PFPeA		69	50-150		74	50-150
13C6_PFDA		88	50-150		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-014
Description: AOPC3-W7-9-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	50-150		81	50-150
13C8_PFOA		87	50-150		88	50-150
13C8_PFOS		70	50-150		72	50-150
13C8_PFOSA		84	50-150		75	50-150
13C9_PFNA		84	50-150		81	50-150
d5-EtFOSAA		80	50-150		78	50-150
d3-MeFOSAA		88	50-150		80	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-015
Description: AOPC5-WNB-14-071421 | Matrix: Aqueous
Date Sampled: 07/14/2021 1820 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 0037	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	18		7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	130		7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	29		3.8	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	7.2		3.8	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	25		3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	220		3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	150		3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	8.7		3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.3	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190		3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	550		3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	27		3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	120		3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	540		3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.2	J	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	410	B	3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		107	50-150
13C2_6:2FTS		112	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		62	50-150
13C2_PFTeDA		64	50-150
13C3_PFBS		69	50-150
13C3_PFHxS		62	50-150
13C3-HFPO-DA		81	50-150
13C4_PFBA		61	50-150
13C4_PFHpA		75	50-150
13C5_PFHxA		67	50-150
13C5_PFPeA		70	50-150
13C6_PFDA		70	50-150
13C7_PFUdA		69	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-015
Description: AOPC5-WNB-14-071421			Matrix: Aqueous
Date Sampled: 07/14/2021 1820		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	50-150
13C8_PFOS		68	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		73	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		78	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-016
Description: FB-06-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1830
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 0048	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.9	B	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		80	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		79	50-150
13C2_PFDoA		62	50-150
13C2_PFTeDA		59	50-150
13C3_PFBS		66	50-150
13C3_PFHxS		68	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		71	50-150
13C4_PFHpA		62	50-150
13C5_PFHxA		71	50-150
13C5_PFPeA		65	50-150
13C6_PFDA		61	50-150
13C7_PFUdA		64	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-016
Description: FB-06-071421			Matrix: Aqueous
Date Sampled: 07/14/2021 1830		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	50-150
13C8_PFOS		61	50-150
13C8_PFOSA		70	50-150
13C9_PFNA		69	50-150
d5-EtFOSAA		72	50-150
d3-MeFOSAA		72	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-017
Description: AOPC1,7-WU4-9-071521 | Matrix: Aqueous
Date Sampled: 07/15/2021 1230 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2134	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	91		7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.1		3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	7.8		3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	34		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.2		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.1	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	6.0		3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	5.1		3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.7		3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	18	B	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	50-150
13C2_6:2FTS		95	50-150
13C2_8:2FTS		68	50-150
13C2_PFDoA		68	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		81	50-150
13C4_PFBA		80	50-150
13C4_PFHpA		68	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		73	50-150
13C7_PFUdA		67	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-017
Description: AOPC1,7-WU4-9-071521			Matrix: Aqueous
Date Sampled: 07/15/2021 1230		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	50-150
13C8_PFOS		75	50-150
13C8_PFOSA		73	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-018
Description: AOPC1,7-PZA1-5C-071521 | Matrix: Aqueous
Date Sampled: 07/15/2021 1500 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2145	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	US	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	21	S	3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.4	J	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	US	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	27		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	250	S	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	13		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	7.4		3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	22		3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	US	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	38		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	17		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	110	B	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		85	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		69	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		78	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		72	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-018
Description: AOPC1,7-PZA1-5C-071521
Matrix: Aqueous
Date Sampled: 07/15/2021 1500
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	50-150
13C8_PFOS		70	50-150
13C8_PFOSA		76	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		80	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-019
Description: FB-07-071521 | Matrix: Aqueous
Date Sampled: 07/15/2021 1540 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1550	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	12		7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	UL	4.0	2.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		93	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		85	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-019
Description: FB-07-071521			Matrix: Aqueous
Date Sampled: 07/15/2021 1540		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-020
Description: AOPC5-14D12A-071621 | Matrix: Aqueous
Date Sampled: 07/16/2021 1200 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1601	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1700	JJG	07/30/2021 1838	10648

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.2	J	7.4	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	11		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.1		3.5	1.8	0.87	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	24		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.2		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	3.0	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.7		3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	6.6		3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	8.3		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	8.3		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	14		3.7	1.9	0.92	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		93	50-150		92	50-150
13C2_6:2FTS		91	50-150		94	50-150
13C2_8:2FTS		78	50-150		92	50-150
13C2_PFDoA		81	50-150		73	50-150
13C2_PFTeDA		84	50-150		77	50-150
13C3_PFBS		85	50-150		80	50-150
13C3_PFHxS		85	50-150		79	50-150
13C3-HFPO-DA		88	50-150		90	50-150
13C4_PFBA		105	50-150		92	50-150
13C4_PFHpA		89	50-150		86	50-150
13C5_PFHxA		79	50-150		81	50-150
13C5_PFPeA		92	50-150		83	50-150
13C6_PFDA		84	50-150		74	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-020
Description: AOPC5-14D12A-071621
Matrix: Aqueous
Date Sampled: 07/16/2021 1200
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		83	50-150		77	50-150
13C8_PFOA		96	50-150		94	50-150
13C8_PFOS		81	50-150		77	50-150
13C8_PFOSA		88	50-150		90	50-150
13C9_PFNA		90	50-150		84	50-150
d5-EtFOSAA		87	50-150		77	50-150
d3-MeFOSAA		89	50-150		86	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-021
Description: AOPC5-14D12A-071621-FD
Matrix: Aqueous
Date Sampled: 07/16/2021 1200
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1611	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1711	JJG	07/30/2021 1838	10648

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.6	J	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	12		3.8	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.3		3.5	1.8	0.89	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	25		3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.7		3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.5	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.6		3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	7.5		3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	8.3		3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	8.6		3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	16		3.8	1.9	0.94	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		99	50-150		100	50-150
13C2_6:2FTS		115	50-150		104	50-150
13C2_8:2FTS		89	50-150		101	50-150
13C2_PFDoA		90	50-150		72	50-150
13C2_PFTeDA		79	50-150		75	50-150
13C3_PFBS		80	50-150		82	50-150
13C3_PFHxS		84	50-150		77	50-150
13C3-HFPO-DA		88	50-150		91	50-150
13C4_PFBA		100	50-150		93	50-150
13C4_PFHpA		91	50-150		90	50-150
13C5_PFHxA		82	50-150		81	50-150
13C5_PFPeA		89	50-150		89	50-150
13C6_PFDA		83	50-150		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-021
Description: AOPC5-14D12A-071621-FD
Matrix: Aqueous
Date Sampled: 07/16/2021 1200
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		88	50-150		69	50-150
13C8_PFOA		100	50-150		95	50-150
13C8_PFOS		77	50-150		82	50-150
13C8_PFOSA		85	50-150		89	50-150
13C9_PFNA		87	50-150		79	50-150
d5-EtFOSAA		91	50-150		87	50-150
d3-MeFOSAA		91	50-150		85	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-022
Description: AOPC3-W19-2-071621 | Matrix: Aqueous
Date Sampled: 07/16/2021 1355 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1622	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.0	J	6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	UL	3.4	1.7	0.85	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	8.1		3.4	1.7	0.85	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.4	J	3.4	1.7	0.85	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.1	J	3.4	1.7	0.85	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.1		3.4	1.7	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.3	J	3.4	1.7	0.85	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		94	50-150
13C2_6:2FTS		97	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		78	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-022
Description: AOPC3-W19-2-071621			Matrix: Aqueous
Date Sampled: 07/16/2021 1355		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-023
Description: AOPC3-W7-10-071621 | Matrix: Aqueous
Date Sampled: 07/16/2021 1520 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1633	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	12		6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.87	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	UL	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	10		3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.4	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.0	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.6		3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	57		3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		108	50-150
13C2_6:2FTS		113	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		75	50-150
13C3_PFHxS		76	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		73	50-150
13C7_PFUdA		76	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-023
Description: AOPC3-W7-10-071621			Matrix: Aqueous
Date Sampled: 07/16/2021 1520		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		84	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		73	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-024
Description: AOPC24-171A-071621 | Matrix: Aqueous
Date Sampled: 07/16/2021 1630 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1643	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.2		3.8	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	JL	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	7.0		3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.4		3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	US	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.5	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	US	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.7	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	US	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.2		3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		93	50-150
13C2_6:2FTS		97	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		90	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		78	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-024
Description: AOPC24-171A-071621
Matrix: Aqueous
Date Sampled: 07/16/2021 1630
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-025
Description: FB-08-071621 | Matrix: Aqueous
Date Sampled: 07/16/2021 1610 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1704	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	UL	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		82	50-150
13C2_6:2FTS		88	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		78	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		82	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20004-025
Description: FB-08-071621		Matrix: Aqueous
Date Sampled: 07/16/2021 1610	Project Name: NASA ARC PFAS	
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-026
Description: FB-07-071621 | Matrix: Aqueous
Date Sampled: 07/15/2021 1600 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1715	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	UL	3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	UQ	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	50-150
13C2_6:2FTS		122	50-150
13C2_8:2FTS		72	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA	N	45	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		75	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20004-026
Description: FB-07-071621		Matrix: Aqueous
Date Sampled: 07/15/2021 1600	Project Name: NASA ARC PFAS	
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		107	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ10113-001
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFOS	1.6	J	1	4.0	2.0	1.0	ng/L	07/28/2021 2009

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		80	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10113-001
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		78	50-150
13C7_PFUdA		75	50-150
13C8_PFOA		84	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10113-002
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	17		1	112	70-150	07/28/2021 2020
11Cl-PF3OUdS	15	16		1	108	70-150	07/28/2021 2020
8:2 FTS	15	17		1	113	67-138	07/28/2021 2020
6:2 FTS	15	16		1	108	64-140	07/28/2021 2020
4:2 FTS	15	17		1	116	63-143	07/28/2021 2020
GenX	32	34		1	106	70-150	07/28/2021 2020
ADONA	15	18		1	122	70-150	07/28/2021 2020
EtFOSAA	16	18		1	115	61-135	07/28/2021 2020
MeFOSAA	16	16		1	99	65-136	07/28/2021 2020
PFBS	14	18		1	125	72-130	07/28/2021 2020
PFDS	15	21		1	139	53-142	07/28/2021 2020
PFHpS	15	18		1	120	69-134	07/28/2021 2020
PFNS	15	14		1	92	69-127	07/28/2021 2020
PFOSA	16	18		1	114	67-137	07/28/2021 2020
PFPeS	15	17		1	112	71-127	07/28/2021 2020
PFHxS	15	16		1	108	68-131	07/28/2021 2020
PFBA	16	19		1	116	73-129	07/28/2021 2020
PFDA	16	19		1	117	71-129	07/28/2021 2020
PFDoA	16	20		1	125	72-134	07/28/2021 2020
PFHpA	16	17		1	107	72-130	07/28/2021 2020
PFHxA	16	20		1	127	72-129	07/28/2021 2020
PFNA	16	17		1	107	69-130	07/28/2021 2020
PFOA	16	19		1	122	71-133	07/28/2021 2020
PFPeA	16	17		1	108	72-129	07/28/2021 2020
PFTeDA	16	19		1	119	71-132	07/28/2021 2020
PFTrDA	16	16		1	100	65-144	07/28/2021 2020
PFUdA	16	18		1	110	69-133	07/28/2021 2020
PFOS	15	15		1	102	65-140	07/28/2021 2020

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	50-150
13C2_6:2FTS		79	50-150
13C2_8:2FTS		71	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		78	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10113-002
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		81	50-150
13C7_PFUdA		76	50-150
13C8_PFOA		81	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		78	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-018MS
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	17		1	125	70-150	07/28/2021 2155
11Cl-PF3OUdS	ND	14	16		1	118	70-150	07/28/2021 2155
8:2 FTS	ND	14	17		1	124	67-138	07/28/2021 2155
6:2 FTS	ND	14	18		1	129	64-140	07/28/2021 2155
4:2 FTS	ND	14	17		1	125	63-143	07/28/2021 2155
GenX	ND	29	35		1	119	70-150	07/28/2021 2155
ADONA	ND	14	18		1	134	70-150	07/28/2021 2155
EtFOSAA	ND	15	17		1	115	61-135	07/28/2021 2155
MeFOSAA	ND	15	19		1	132	65-136	07/28/2021 2155
PFBS	21	13	37		1	120	72-130	07/28/2021 2155
PFDS	ND	14	18		1	127	53-142	07/28/2021 2155
PFHpS	2.4	14	20		1	129	69-134	07/28/2021 2155
PFNS	ND	14	17		1	118	69-127	07/28/2021 2155
PFOSA	ND	15	18		1	124	67-137	07/28/2021 2155
PFPeS	27	14	39		1	86	71-127	07/28/2021 2155
PFHxS	250	13	290	N	1	270	68-131	07/28/2021 2155
PFBA	13	15	31		1	122	73-129	07/28/2021 2155
PFDA	ND	15	19		1	129	71-129	07/28/2021 2155
PFDoA	ND	15	19		1	130	72-134	07/28/2021 2155
PFHpA	7.4	15	26		1	126	72-130	07/28/2021 2155
PFHxA	22	15	38		1	113	72-129	07/28/2021 2155
PFNA	ND	15	16		1	110	69-130	07/28/2021 2155
PFOA	38	15	58		1	132	71-133	07/28/2021 2155
PFPeA	17	15	34		1	119	72-129	07/28/2021 2155
PFTeDA	ND	15	19		1	130	71-132	07/28/2021 2155
PFTrDA	ND	15	20		1	136	65-144	07/28/2021 2155
PFUdA	ND	15	16		1	110	69-133	07/28/2021 2155
PFOS	110	14	120		1	95	65-140	07/28/2021 2155

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		84	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		68	50-150
13C2_PFDoA		66	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		77	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-018MS
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	50-150
13C7_PFUdA		71	50-150
13C8_PFOA		80	50-150
13C8_PFOS		73	50-150
13C8_PFOSA		71	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20004-018MD
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	14	16		1	115	5.9	70-150	30	07/28/2021 2206
11Cl-PF3OUdS	ND	14	16		1	113	2.5	70-150	30	07/28/2021 2206
8:2 FTS	ND	14	20	N	1	142	16	67-138	30	07/28/2021 2206
6:2 FTS	ND	14	17		1	118	7.2	64-140	30	07/28/2021 2206
4:2 FTS	ND	14	18		1	127	3.5	63-143	30	07/28/2021 2206
GenX	ND	30	36		1	120	2.3	70-150	30	07/28/2021 2206
ADONA	ND	14	19		1	136	3.2	70-150	30	07/28/2021 2206
EtFOSAA	ND	15	18		1	123	8.6	61-135	30	07/28/2021 2206
MeFOSAA	ND	15	19		1	125	3.7	65-136	30	07/28/2021 2206
PFBS	21	13	40	N	1	139	7.5	72-130	30	07/28/2021 2206
PFDS	ND	14	17		1	115	8.2	53-142	30	07/28/2021 2206
PFHpS	2.4	14	21		1	134	5.1	69-134	30	07/28/2021 2206
PFNS	ND	14	17		1	122	4.9	69-127	30	07/28/2021 2206
PFOSA	ND	15	22	N	1	146	18	67-137	30	07/28/2021 2206
PFPeS	27	14	45		1	123	13	71-127	30	07/28/2021 2206
PFHxS	250	14	300	N	1	313	2.2	68-131	30	07/28/2021 2206
PFBA	13	15	31		1	123	1.3	73-129	30	07/28/2021 2206
PFDA	ND	15	18		1	124	2.6	71-129	30	07/28/2021 2206
PFDoA	ND	15	18		1	124	3.2	72-134	30	07/28/2021 2206
PFHpA	7.4	15	26		1	127	1.9	72-130	30	07/28/2021 2206
PFHxA	22	15	40		1	122	4.2	72-129	30	07/28/2021 2206
PFNA	ND	15	20	N	1	133	21	69-130	30	07/28/2021 2206
PFOA	38	15	57		1	127	0.59	71-133	30	07/28/2021 2206
PFPeA	17	15	34		1	114	1.1	72-129	30	07/28/2021 2206
PFTeDA	ND	15	20		1	131	3.3	71-132	30	07/28/2021 2206
PFTrDA	ND	15	18		1	119	12	65-144	30	07/28/2021 2206
PFUdA	ND	15	17		1	117	7.8	69-133	30	07/28/2021 2206
PFOS	110	14	130		1	137	4.9	65-140	30	07/28/2021 2206

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		90	50-150
13C2_6:2FTS		105	50-150
13C2_8:2FTS		66	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		80	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		80	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Sample ID: WG20004-018MD
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	50-150
13C7_PFUdA		75	50-150
13C8_PFOA		81	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10188-001
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		76	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10188-001
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		98	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS - LCS

Sample ID: WQ10188-002
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	18		1	122	70-150	07/28/2021 1321
11Cl-PF3OUdS	15	18		1	117	70-150	07/28/2021 1321
8:2 FTS	15	15		1	101	67-138	07/28/2021 1321
6:2 FTS	15	15		1	99	64-140	07/28/2021 1321
4:2 FTS	15	21		1	143	63-143	07/28/2021 1321
GenX	32	36		1	113	70-150	07/28/2021 1321
ADONA	15	20		1	129	70-150	07/28/2021 1321
EtFOSAA	16	18		1	113	61-135	07/28/2021 1321
MeFOSAA	16	16		1	103	65-136	07/28/2021 1321
PFBS	14	18		1	124	72-130	07/28/2021 1321
PFDS	15	17		1	113	53-142	07/28/2021 1321
PFHpS	15	20		1	133	69-134	07/28/2021 1321
PFNS	15	17		1	109	69-127	07/28/2021 1321
PFOSA	16	19		1	122	67-137	07/28/2021 1321
PFPeS	15	20	N	1	134	71-127	07/28/2021 1321
PFHxS	15	18		1	122	68-131	07/28/2021 1321
PFBA	16	20		1	123	73-129	07/28/2021 1321
PFDA	16	19		1	120	71-129	07/28/2021 1321
PFDoA	16	20		1	127	72-134	07/28/2021 1321
PFHpA	16	19		1	119	72-130	07/28/2021 1321
PFHxA	16	19		1	118	72-129	07/28/2021 1321
PFNA	16	18		1	114	69-130	07/28/2021 1321
PFOA	16	19		1	118	71-133	07/28/2021 1321
PFPeA	16	18		1	114	72-129	07/28/2021 1321
PFTeDA	16	19		1	117	71-132	07/28/2021 1321
PFTrDA	16	23		1	141	65-144	07/28/2021 1321
PFUdA	16	20		1	124	69-133	07/28/2021 1321
PFOS	15	18		1	122	65-140	07/28/2021 1321

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		66	50-150
13C2_6:2FTS		82	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		71	50-150
13C3_PFHxS		72	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		73	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		74	50-150
13C5_PFPeA		80	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10188-002
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		71	50-150
13C7_PFUdA		69	50-150
13C8_PFOA		83	50-150
13C8_PFOS		73	50-150
13C8_PFOSA		70	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		74	50-150
d3-MeFOSAA		73	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-024MS
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	16		1	115	70-150	07/28/2021 1654
11Cl-PF3OUdS	ND	14	15		1	102	70-150	07/28/2021 1654
8:2 FTS	ND	14	19		1	133	67-138	07/28/2021 1654
6:2 FTS	ND	14	14		1	99	64-140	07/28/2021 1654
4:2 FTS	ND	14	16		1	115	63-143	07/28/2021 1654
GenX	ND	30	34		1	112	70-150	07/28/2021 1654
ADONA	ND	14	18		1	129	70-150	07/28/2021 1654
EtFOSAA	ND	15	17		1	111	61-135	07/28/2021 1654
MeFOSAA	ND	15	19		1	125	65-136	07/28/2021 1654
PFBS	6.2	13	23		1	124	72-130	07/28/2021 1654
PFDS	ND	15	17		1	114	53-142	07/28/2021 1654
PFHpS	ND	14	17		1	121	69-134	07/28/2021 1654
PFNS	ND	14	16		1	113	69-127	07/28/2021 1654
PFOSA	ND	15	18		1	121	67-137	07/28/2021 1654
PFPeS	2.0	14	19		1	117	71-127	07/28/2021 1654
PFHxS	7.0	14	25		1	129	68-131	07/28/2021 1654
PFBA	4.4	15	23		1	123	73-129	07/28/2021 1654
PFDA	ND	15	20	N	1	130	71-129	07/28/2021 1654
PFDoA	ND	15	19		1	124	72-134	07/28/2021 1654
PFHpA	ND	15	18		1	119	72-130	07/28/2021 1654
PFHxA	1.5	15	18		1	113	72-129	07/28/2021 1654
PFNA	ND	15	20	N	1	132	69-130	07/28/2021 1654
PFOA	2.7	15	21		1	119	71-133	07/28/2021 1654
PFPeA	1.7	15	19		1	117	72-129	07/28/2021 1654
PFTeDA	ND	15	18		1	118	71-132	07/28/2021 1654
PFTrDA	ND	15	21		1	137	65-144	07/28/2021 1654
PFUdA	ND	15	21	N	1	139	69-133	07/28/2021 1654
PFOS	4.2	14	17		1	94	65-140	07/28/2021 1654

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		87	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		77	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS - MS

Sample ID: WG20004-024MS
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		76	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		91	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10648-001
Batch: 10648
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/30/2021 1838

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1626

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		73	50-150
13C2_6:2FTS		84	50-150
13C2_8:2FTS		74	50-150
13C2_PFDoA		68	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		70	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		74	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		72	50-150
13C5_PFPeA		78	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		71	50-150
13C8_PFOA		78	50-150
13C8_PFOS		66	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		75	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		73	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10648-002
Batch: 10648
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/30/2021 1838

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
PFPeS	15	15		1	102	71-127	07/31/2021 1637

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		79	50-150
13C2_6:2FTS		75	50-150
13C2_8:2FTS		80	50-150
13C2_PFDoA		70	50-150
13C2_PFTeDA		73	50-150
13C3_PFBS		70	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		74	50-150
13C4_PFHpA		69	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		76	50-150
13C8_PFOA		77	50-150
13C8_PFOS		72	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		76	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		72	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10799-001
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10799-001
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		96	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10799-002
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	109	70-150	08/04/2021 1404
11Cl-PF3OUdS	15	16		1	105	70-150	08/04/2021 1404
8:2 FTS	15	13		1	82	67-138	08/04/2021 1404
6:2 FTS	15	12		1	78	64-140	08/04/2021 1404
4:2 FTS	15	15		1	103	63-143	08/04/2021 1404
GenX	32	32		1	99	70-150	08/04/2021 1404
ADONA	15	17		1	115	70-150	08/04/2021 1404
EtFOSAA	16	16		1	101	61-135	08/04/2021 1404
MeFOSAA	16	19		1	116	65-136	08/04/2021 1404
PFBS	14	14		1	101	72-130	08/04/2021 1404
PFDS	15	16		1	104	53-142	08/04/2021 1404
PFHpS	15	15		1	99	69-134	08/04/2021 1404
PFNS	15	17		1	108	69-127	08/04/2021 1404
PFOSA	16	17		1	105	67-137	08/04/2021 1404
PFPeS	15	16		1	109	71-127	08/04/2021 1404
PFHxS	15	16		1	111	68-131	08/04/2021 1404
PFBA	16	17		1	107	73-129	08/04/2021 1404
PFDA	16	17		1	105	71-129	08/04/2021 1404
PFDoA	16	18		1	110	72-134	08/04/2021 1404
PFHpA	16	17		1	103	72-130	08/04/2021 1404
PFHxA	16	17		1	106	72-129	08/04/2021 1404
PFNA	16	18		1	110	69-130	08/04/2021 1404
PFOA	16	19		1	117	71-133	08/04/2021 1404
PFPeA	16	17		1	106	72-129	08/04/2021 1404
PFTeDA	16	17		1	107	71-132	08/04/2021 1404
PFTrDA	16	19		1	116	65-144	08/04/2021 1404
PFUdA	16	18		1	113	69-133	08/04/2021 1404
PFOS	15	16		1	108	65-140	08/04/2021 1404

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		82	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		89	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10799-002
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		91	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		80	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCSD

Sample ID: WQ10799-003
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	15		1	103	5.0	70-150	30	08/04/2021 1414
11Cl-PF3OUdS	15	14		1	95	9.9	70-150	30	08/04/2021 1414
8:2 FTS	15	15		1	99	18	67-138	30	08/04/2021 1414
6:2 FTS	15	12		1	79	0.76	64-140	30	08/04/2021 1414
4:2 FTS	15	16		1	105	1.7	63-143	30	08/04/2021 1414
GenX	32	31		1	98	0.85	70-150	30	08/04/2021 1414
ADONA	15	15		1	102	12	70-150	30	08/04/2021 1414
EtFOSAA	16	13		1	82	20	61-135	30	08/04/2021 1414
MeFOSAA	16	15		1	91	24	65-136	30	08/04/2021 1414
PFBS	14	14		1	96	4.6	72-130	30	08/04/2021 1414
PFDS	15	14		1	92	12	53-142	30	08/04/2021 1414
PFHpS	15	15		1	102	3.0	69-134	30	08/04/2021 1414
PFNS	15	15		1	98	9.8	69-127	30	08/04/2021 1414
PFOSA	16	17		1	105	0.14	67-137	30	08/04/2021 1414
PFPeS	15	14		1	96	12	71-127	30	08/04/2021 1414
PFHxS	15	15		1	104	6.4	68-131	30	08/04/2021 1414
PFBA	16	17		1	104	2.6	73-129	30	08/04/2021 1414
PFDA	16	17		1	109	3.8	71-129	30	08/04/2021 1414
PFDoA	16	17		1	107	2.9	72-134	30	08/04/2021 1414
PFHpA	16	16		1	99	4.6	72-130	30	08/04/2021 1414
PFHxA	16	15		1	94	11	72-129	30	08/04/2021 1414
PFNA	16	16		1	97	13	69-130	30	08/04/2021 1414
PFOA	16	17		1	108	7.5	71-133	30	08/04/2021 1414
PFPeA	16	16		1	101	5.6	72-129	30	08/04/2021 1414
PFTeDA	16	16		1	103	3.7	71-132	30	08/04/2021 1414
PFTrDA	16	20		1	123	5.9	65-144	30	08/04/2021 1414
PFUdA	16	16		1	103	9.3	69-133	30	08/04/2021 1414
PFOS	15	15		1	99	9.4	65-140	30	08/04/2021 1414

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		83	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		77	50-150
13C3_PFHxS		78	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		79	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCSD

Sample ID: WQ10799-003
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		87	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		72	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99902-001
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		84	50-150
13C2_6:2FTS		79	50-150
13C2_8:2FTS		71	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		65	50-150
13C3_PFBS		71	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		75	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99902-001
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		76	50-150
13C7_PFUdA		67	50-150
13C8_PFOA		81	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		78	50-150
13C9_PFNA		77	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99902-002
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	107	70-150	07/25/2021 2318
11Cl-PF3OUdS	15	14		1	95	70-150	07/25/2021 2318
8:2 FTS	15	18		1	118	67-138	07/25/2021 2318
6:2 FTS	15	11		1	75	64-140	07/25/2021 2318
4:2 FTS	15	16		1	107	63-143	07/25/2021 2318
GenX	32	30		1	94	70-150	07/25/2021 2318
ADONA	15	16		1	104	70-150	07/25/2021 2318
EtFOSAA	16	15		1	96	61-135	07/25/2021 2318
MeFOSAA	16	15		1	93	65-136	07/25/2021 2318
PFBS	14	15		1	105	72-130	07/25/2021 2318
PFDS	15	19		1	121	53-142	07/25/2021 2318
PFHpS	15	16		1	104	69-134	07/25/2021 2318
PFNS	15	16		1	101	69-127	07/25/2021 2318
PFOSA	16	16		1	101	67-137	07/25/2021 2318
PFPeS	15	16		1	105	71-127	07/25/2021 2318
PFHxS	15	15		1	101	68-131	07/25/2021 2318
PFBA	16	17		1	105	73-129	07/25/2021 2318
PFDA	16	17		1	109	71-129	07/25/2021 2318
PFDoA	16	18		1	110	72-134	07/25/2021 2318
PFHpA	16	19		1	119	72-130	07/25/2021 2318
PFHxA	16	18		1	113	72-129	07/25/2021 2318
PFNA	16	17		1	105	69-130	07/25/2021 2318
PFOA	16	17		1	108	71-133	07/25/2021 2318
PFPeA	16	16		1	102	72-129	07/25/2021 2318
PFTeDA	16	16		1	102	71-132	07/25/2021 2318
PFTrDA	16	20		1	122	65-144	07/25/2021 2318
PFUdA	16	14		1	90	69-133	07/25/2021 2318
PFOS	15	14		1	94	65-140	07/25/2021 2318

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		89	50-150
13C2_8:2FTS		75	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		73	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99902-002
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	50-150
13C7_PFUdA		80	50-150
13C8_PFOA		87	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-001MS
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	14		1	100	70-150	07/26/2021 1547
11Cl-PF3OUdS	ND	14	12		1	90	70-150	07/26/2021 1547
8:2 FTS	ND	14	17		1	121	67-138	07/26/2021 1547
6:2 FTS	47	14	63		1	110	64-140	07/26/2021 1547
4:2 FTS	ND	14	14		1	102	63-143	07/26/2021 1547
GenX	ND	29	32		1	110	70-150	07/26/2021 1547
ADONA	ND	14	16		1	113	70-150	07/26/2021 1547
EtFOSAA	ND	15	15		1	100	61-135	07/26/2021 1547
MeFOSAA	ND	15	15		1	104	65-136	07/26/2021 1547
PFBS	18	13	33		1	109	72-130	07/26/2021 1547
PFDS	ND	14	14		1	103	53-142	07/26/2021 1547
PFHpS	4.2	14	19		1	107	69-134	07/26/2021 1547
PFNS	ND	14	15		1	107	69-127	07/26/2021 1547
PFOSA	ND	15	14		1	96	67-137	07/26/2021 1547
PFPeS	12	14	23		1	79	71-127	07/26/2021 1547
PFHxS	120	13	130		1	101	68-131	07/26/2021 1547
PFBA	73	15	94	N	1	148	73-129	07/26/2021 1547
PFDA	ND	15	15		1	102	71-129	07/26/2021 1547
PFDoA	ND	15	16		1	108	72-134	07/26/2021 1547
PFHpA	42	15	57		1	101	72-130	07/26/2021 1547
PFHxA	240	15	260	N	1	152	72-129	07/26/2021 1547
PFNA	2.9	15	21		1	121	69-130	07/26/2021 1547
PFOA	34	15	51		1	117	71-133	07/26/2021 1547
PFPeA	230	15	260	N	1	249	72-129	07/26/2021 1547
PFTeDA	ND	15	16		1	112	71-132	07/26/2021 1547
PFTrDA	ND	15	16		1	111	65-144	07/26/2021 1547
PFUdA	ND	15	18		1	124	69-133	07/26/2021 1547
PFOS	470	14	470	N	1	47	65-140	07/26/2021 1547

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		111	50-150
13C2_6:2FTS		133	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		95	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-001MS
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		98	50-150
13C7_PFUdA		79	50-150
13C8_PFOA		109	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		109	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG20004-002DU
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	07/26/2021 1608
11Cl-PF3OUdS	ND	ND		1	0.00	20	07/26/2021 1608
8:2 FTS	ND	ND		1	0.00	20	07/26/2021 1608
6:2 FTS	58	62		1	6.5	20	07/26/2021 1608
4:2 FTS	ND	ND		1	0.00	20	07/26/2021 1608
GenX	ND	ND		1	0.00	20	07/26/2021 1608
ADONA	ND	ND		1	0.00	20	07/26/2021 1608
EtFOSAA	ND	ND		1	0.00	20	07/26/2021 1608
MeFOSAA	ND	ND		1	0.00	20	07/26/2021 1608
PFBS	12	11		1	15	20	07/26/2021 1608
PFDS	ND	ND		1	0.00	20	07/26/2021 1608
PFHpS	ND	ND		1	0.00	20	07/26/2021 1608
PFNS	ND	ND		1	0.00	20	07/26/2021 1608
PFOSA	ND	ND		1	0.00	20	07/26/2021 1608
PFPeS	8.3	8.1		1	2.0	20	07/26/2021 1608
PFHxS	32	37		1	15	20	07/26/2021 1608
PFBA	12	11		1	9.3	20	07/26/2021 1608
PFDA	ND	ND		1	0.00	20	07/26/2021 1608
PFDoA	ND	ND		1	0.00	20	07/26/2021 1608
PFHpA	ND	ND		1	0.00	20	07/26/2021 1608
PFHxA	2.2	2.0	J	1	6.6	20	07/26/2021 1608
PFNA	ND	ND		1	0.00	20	07/26/2021 1608
PFOA	1.6	2.1	+	1	25	20	07/26/2021 1608
PFPeA	1.8	1.8	J	1	1.7	20	07/26/2021 1608
PFTeDA	ND	ND		1	0.00	20	07/26/2021 1608
PFTrDA	ND	ND		1	0.00	20	07/26/2021 1608
PFUdA	ND	ND		1	0.00	20	07/26/2021 1608
PFOS	55	48		1	12	20	07/26/2021 1608

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		109	50-150
13C2_6:2FTS		137	50-150
13C2_8:2FTS		103	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA		80	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		96	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		87	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG20004-002DU
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		94	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		107	50-150
13C8_PFOS		92	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Chain of Custody
and
Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122949

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: [signature] [signature]	Analysis (Attach list if more space is needed)	Page 1 of 3
City: Oakland State: CA Zip Code: 94612	X		WG20004
Project Name: NASA ARC PFAS	Printed Name: Ryan Melendez Callie Neaves		KES2
Project No.: 103IG667601 P.O. No.			

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	E-Grab C-Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	HCl/CH	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS (DSMB+5)	Remarks / Cooler I.D.
ADPC18-11E02A-071221	7/12/21	1315	G	X			2							X	
ADPC18-WN8-7-071221	7/12/21	1320	G	X			2							X	
ADPC1-11N21A1-071221	7/12/21	1520	G	X			2							X	
ADPC8-W11-2-071221	7/12/21	1610	G	X			2							X	
ADPC6-WU4-18-071221	7/12/21	1805	G	X			2							X	
FB04-071221	7/12/21	1700	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited MT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TT [signature]	7/19/21	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	7/20/21	0955	4. Laboratory received by: [signature]	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on ice (Circle) Yes No Ice Pack Receipt Temp. 1.3 °C Temp Blank ☐ Y ☑ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122959

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x Ann Mus MJ RCMe	Analysis (Attach list if more space is needed)	Page 2 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves, Mike Dahlquist, Ryan Melendez		WG20004
Project Name: NASA ARC PFAS			KES2
Project No.: 103IG667601; P.O. No.:			

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Guidance Description	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS 10SMB-15	Remarks / Cooler I.D.
AOPC25-15H12A-071321	7/13/21	1245	G	X			2							X	
AOPC25-15B10A-071321	7/13/21	1315	G	X			2							X	
AOPC24-64A-071321	7/13/21	1605	G	X			2							X	
AOPC24-WU4-1-071321	7/13/21	1605	G	X			2							X	
FB-05-071321	7/13/21	1615	G	X			2							X	
AOPC5-WU4-19-071421	7/14/21	1135	G	X			2							X	
AOPC5-14D39A-071421	7/14/21	1620	G	X			2							X	
AOPC3-W7-9-071421	7/14/21	1620	G	X			2							X	
AOPC5-WNB-14-071421	7/14/21	1820	G	X			2							X	
FB-06-071421	7/14/21	1830	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TC Ann Mus	7/19/21	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	7/20/21	0955	4. Laboratory received by: Amy Goodwin	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 1.3 °C
Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
108 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122967

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: [signature]	Analysis (Attach list if more space is needed)	Page 3 of 3
City: Oakland State: CA Zip Code: 94612	Printed Name: Callie Neaves, Ryan Melendez, Jessica Robinson		WG20004
Project Name: NASA ARC PFAS			KES2
Project No.: 103IG667601 P.O. No.			

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	E-Grab C-Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	NaOH/	Field Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC1,7-WU4-9-071521	7/15/21	1230	G	x			2							x	
AOPC1,7-P2A1-5C-071521	7/15/21	1500	G	x			6							x	MS/MSD
FB-07-071521	7/15/21	1540	G	x			2							x	
AOPC5-14D12A-071621	7/16/21	1200	G	x			2							x	
AOPC5-14D12A-071621-FD	7/16/21	1200	G	x			2							x	Field duplicate
AOPC3-W19-2-071621	7/16/21	1355	G	x			2							x	
AOPC3-W7-10-071621	7/16/21	1520	G	x			2							x	
AOPC24-171A-071621	7/16/21	1630	G	x			2							x	
FB-08-071621	7/16/21	1610	G	x			2							x	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TE [signature]	7/19/21	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	7/20/21	0955	4. Laboratory received by: [signature]	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on ice (Circle) Yes No Ice Pack Receipt Temp. 1.3 °C Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: JRG2 / 07/20/2021 Lot #: WG200004

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:			
☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

1.3 / 1.3 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JRG2 Date: 07/20/2021

Comments: Excess: 1-250ml FB-07-071621 7/16 @ 1600

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dahlquist

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Lot Number:**WG22011**

Date Completed:08/05/2021

08/09/2021 4:18 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Case Narrative
Tetra Tech
Lot Number: WG22011

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Samples WG22011-004, WG22011-019, WG22011-020 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

For samples WG22011-015, WG22011-019 sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Surrogate recovery may be adversely affected

The laboratory control sample (LCS) for analytical batch 10421 recovered outside acceptance criteria for PFPeS. For the following sample there was an insufficient amount to perform a re-extraction or re-analysis: WG22011-007, WG22011-009. The data has been reported.

The laboratory control sample (LCS) for analytical batch 10188 recovered outside acceptance criteria for PFPeS. Affected samples were re-extracted and both sets of data have been reported.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for prep batch 10452 exceeded acceptance criteria for the following analytes: GenX. These analytes were biased high and were not detected in the samples affected: WG22011-014, WG22011-015, WG22011-016, WG22011-017, WG22011-018, WG22011-019, WG22011-020, WG22011-021.

The laboratory control sample (LCS) for prep batch 10675 recovered outside acceptance criteria for PFPeS and 6:2 FTS. For the following samples there was an insufficient amount to perform a re-extraction or re-analysis: WG22011-003, WG22011-004, WG22011-005, WG22011-006, WG22011-008. The data has been reported.

The continuing calibration verification (CCV) associated with samples WG22011-003, WG22011-004, WG22011-005, WG22011-006, WG22011-008, WG22011-014, WG22011-015, WG22011-016, WG22011-017, WG22011-018, WG22011-019, WG22011-020, WG22011-021 for analyte: GenX recovered above the upper control limit. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

Surrogate recovery for the following samples was outside the upper control limit: WG22011-005, WG22011-006, WG22011-012. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: WG22011-007. The sample was also the batch duplicate and had concurring surrogate recoveries. Both sets of data have been reported.

Surrogate recovery for the following sample was outside control limits: WG22011-019. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: WG22011-004. This sample was also the batch duplicate with acceptable results. Both sets of data have been reported.

The MS/MSD associated with sample WG22011-012 had 6:2 FTS recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample Summary

Tetra Tech

Lot Number: WG22011

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC24-W89-1-071921	Aqueous	07/19/2021 1210	07/22/2021
002	AOPC3-W7-3-071921	Aqueous	07/19/2021 1430	07/22/2021
003	AOPC3-W7-3-071921-FD	Aqueous	07/19/2021 1430	07/22/2021
004	AOPC3-W7-11-071921	Aqueous	07/19/2021 1545	07/22/2021
005	AOPC03-W7-13-071921	Aqueous	07/19/2021 1545	07/22/2021
006	AOPC03-UST-MW-02-071921	Aqueous	07/19/2021 1425	07/22/2021
007	AOPC21-W4-14-071921	Aqueous	07/19/2021 1735	07/22/2021
008	AOPC21-W6-6-071921	Aqueous	07/19/2021 1750	07/22/2021
009	FB-09-071921	Aqueous	07/19/2021 1600	07/22/2021
010	AOPC9-W2-13-072021	Aqueous	07/20/2021 1335	07/22/2021
011	AOPC21-W6-5-072021	Aqueous	07/20/2021 1410	07/22/2021
012	AOPC17,21-WU5-12-072021	Aqueous	07/20/2021 1420	07/22/2021
013	SWB-01-072021	Aqueous	07/20/2021 1430	07/22/2021
014	AOPC21-WU5-10-072021	Aqueous	07/20/2021 1540	07/22/2021
015	AOPC21-W4-6-072021	Aqueous	07/20/2021 1615	07/22/2021
016	FB-10-072021	Aqueous	07/20/2021 1650	07/22/2021
017	AOPC10-WGC2-13-072121	Aqueous	07/21/2021 0540	07/22/2021
018	AOPC10-WGC2-8-072121	Aqueous	07/21/2021 0545	07/22/2021
019	AOPC10-WGC2-10-072121	Aqueous	07/21/2021 0730	07/22/2021
020	AOPC10-WGC2-1-072121	Aqueous	07/21/2021 0740	07/22/2021
021	FB-11-072121	Aqueous	07/21/2021 1100	07/22/2021

(21 samples)

Detection Summary

Tetra Tech

Lot Number: WG22011

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	AOPC24-W89-1-071921	Aqueous	6:2 FTS	PFAS by ID	43		ng/L	12
001	AOPC24-W89-1-071921	Aqueous	PFBS	PFAS by ID	40		ng/L	12
001	AOPC24-W89-1-071921	Aqueous	PFHpS	PFAS by ID	0.94	J	ng/L	12
001	AOPC24-W89-1-071921	Aqueous	PFPeS	PFAS by ID	34		ng/L	12
001	AOPC24-W89-1-071921	Aqueous	PFHxS	PFAS by ID	130		ng/L	12
001	AOPC24-W89-1-071921	Aqueous	PFBA	PFAS by ID	12		ng/L	12
001	AOPC24-W89-1-071921	Aqueous	PFHpA	PFAS by ID	4.2		ng/L	12
001	AOPC24-W89-1-071921	Aqueous	PFHxA	PFAS by ID	21		ng/L	12
001	AOPC24-W89-1-071921	Aqueous	PFOA	PFAS by ID	11		ng/L	12
001	AOPC24-W89-1-071921	Aqueous	PFPeA	PFAS by ID	13		ng/L	12
001	AOPC24-W89-1-071921	Aqueous	PFOS	PFAS by ID	57		ng/L	12
002	AOPC3-W7-3-071921	Aqueous	6:2 FTS	PFAS by ID	48		ng/L	14
002	AOPC3-W7-3-071921	Aqueous	PFBS	PFAS by ID	7.9		ng/L	14
002	AOPC3-W7-3-071921	Aqueous	PFPeS	PFAS by ID	4.2		ng/L	14
002	AOPC3-W7-3-071921	Aqueous	PFHxS	PFAS by ID	40		ng/L	14
002	AOPC3-W7-3-071921	Aqueous	PFBA	PFAS by ID	12		ng/L	14
002	AOPC3-W7-3-071921	Aqueous	PFHxA	PFAS by ID	1.4	J	ng/L	14
002	AOPC3-W7-3-071921	Aqueous	PFOA	PFAS by ID	20		ng/L	14
002	AOPC3-W7-3-071921	Aqueous	PFOS	PFAS by ID	33		ng/L	14
003	AOPC3-W7-3-071921-FD	Aqueous	6:2 FTS	PFAS by ID	28		ng/L	16
003	AOPC3-W7-3-071921-FD	Aqueous	PFBS	PFAS by ID	7.5		ng/L	16
003	AOPC3-W7-3-071921-FD	Aqueous	PFHxS	PFAS by ID	42		ng/L	16
003	AOPC3-W7-3-071921-FD	Aqueous	PFBA	PFAS by ID	12		ng/L	16
003	AOPC3-W7-3-071921-FD	Aqueous	PFHpA	PFAS by ID	0.93	J	ng/L	16
003	AOPC3-W7-3-071921-FD	Aqueous	PFHxA	PFAS by ID	1.2	J	ng/L	16
003	AOPC3-W7-3-071921-FD	Aqueous	PFOA	PFAS by ID	19		ng/L	16
003	AOPC3-W7-3-071921-FD	Aqueous	PFOS	PFAS by ID	30		ng/L	16
003	AOPC3-W7-3-071921-FD	Aqueous	PFPeS	PFAS by ID	3.8	L	ng/L	18
004	AOPC3-W7-11-071921	Aqueous	6:2 FTS	PFAS by ID	2.6	J	ng/L	20
004	AOPC3-W7-11-071921	Aqueous	EtFOSAA	PFAS by ID	8.3		ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFBS	PFAS by ID	13		ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFHpS	PFAS by ID	1.3	J	ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFHxS	PFAS by ID	65		ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFBA	PFAS by ID	12		ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFDoA	PFAS by ID	1.1	J	ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFHpA	PFAS by ID	2.5	J	ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFHxA	PFAS by ID	4.1		ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFOA	PFAS by ID	19		ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFPeA	PFAS by ID	2.4	J	ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFTeDA	PFAS by ID	14		ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFTrDA	PFAS by ID	2.1	J	ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFOS	PFAS by ID	59		ng/L	20
004	AOPC3-W7-11-071921	Aqueous	PFPeS	PFAS by ID	7.7	L	ng/L	22

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
005	AOPC03-W7-13-071921	Aqueous	6:2 FTS	PFAS by ID	210		ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFBS	PFAS by ID	7.6		ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFOSA	PFAS by ID	0.93	J	ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFHxS	PFAS by ID	36		ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFBA	PFAS by ID	11		ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFHpA	PFAS by ID	2.1	J	ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFHxA	PFAS by ID	2.1	J	ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFNA	PFAS by ID	1.6	J	ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFOA	PFAS by ID	17		ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFPeA	PFAS by ID	1.2	J	ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFOS	PFAS by ID	23		ng/L	24
005	AOPC03-W7-13-071921	Aqueous	PFPeS	PFAS by ID	2.9	JL	ng/L	26
006	AOPC03-UST-MW-02-071921	Aqueous	6:2 FTS	PFAS by ID	290		ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	GenX	PFAS by ID	6.1	J	ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFBS	PFAS by ID	13		ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFHpS	PFAS by ID	1.4	J	ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFHxS	PFAS by ID	57		ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFBA	PFAS by ID	18		ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFDA	PFAS by ID	1.2	J	ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFDoA	PFAS by ID	1.4	J	ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFHpA	PFAS by ID	2.9	J	ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFHxA	PFAS by ID	3.3	J	ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFOA	PFAS by ID	15		ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFPeA	PFAS by ID	5.1		ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFOS	PFAS by ID	50		ng/L	28
006	AOPC03-UST-MW-02-071921	Aqueous	PFPeS	PFAS by ID	4.4	L	ng/L	30
007	AOPC21-W4-14-071921	Aqueous	6:2 FTS	PFAS by ID	14	Q	ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFBS	PFAS by ID	13		ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFHpS	PFAS by ID	1.4	J	ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFPeS	PFAS by ID	5.4	L	ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFHxS	PFAS by ID	67		ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFBA	PFAS by ID	40		ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFDA	PFAS by ID	2.5	J	ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFHpA	PFAS by ID	8.5		ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFHxA	PFAS by ID	20		ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFNA	PFAS by ID	3.5	J	ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFOA	PFAS by ID	60		ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFPeA	PFAS by ID	12		ng/L	32
007	AOPC21-W4-14-071921	Aqueous	PFOS	PFAS by ID	70		ng/L	32
008	AOPC21-W6-6-071921	Aqueous	6:2 FTS	PFAS by ID	7.8		ng/L	34
008	AOPC21-W6-6-071921	Aqueous	PFBS	PFAS by ID	9.9		ng/L	34
008	AOPC21-W6-6-071921	Aqueous	PFHpS	PFAS by ID	1.7	J	ng/L	34
008	AOPC21-W6-6-071921	Aqueous	PFHxS	PFAS by ID	73		ng/L	34
008	AOPC21-W6-6-071921	Aqueous	PFBA	PFAS by ID	17		ng/L	34
008	AOPC21-W6-6-071921	Aqueous	PFHpA	PFAS by ID	11		ng/L	34
008	AOPC21-W6-6-071921	Aqueous	PFHxA	PFAS by ID	8.3		ng/L	34
008	AOPC21-W6-6-071921	Aqueous	PFOA	PFAS by ID	31		ng/L	34
008	AOPC21-W6-6-071921	Aqueous	PFPeA	PFAS by ID	5.7		ng/L	34

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
008	AOPC21-W6-6-071921	Aqueous	PFOS	PFAS by ID	81		ng/L	34
008	AOPC21-W6-6-071921	Aqueous	PFPeS	PFAS by ID	5.1	L	ng/L	36
010	AOPC9-W2-13-072021	Aqueous	6:2 FTS	PFAS by ID	2.9	J	ng/L	40
010	AOPC9-W2-13-072021	Aqueous	PFBS	PFAS by ID	21		ng/L	40
010	AOPC9-W2-13-072021	Aqueous	PFPeS	PFAS by ID	17		ng/L	40
010	AOPC9-W2-13-072021	Aqueous	PFHxS	PFAS by ID	110		ng/L	40
010	AOPC9-W2-13-072021	Aqueous	PFBA	PFAS by ID	29		ng/L	40
010	AOPC9-W2-13-072021	Aqueous	PFHpA	PFAS by ID	6.2		ng/L	40
010	AOPC9-W2-13-072021	Aqueous	PFHxA	PFAS by ID	23		ng/L	40
010	AOPC9-W2-13-072021	Aqueous	PFOA	PFAS by ID	32		ng/L	40
010	AOPC9-W2-13-072021	Aqueous	PFPeA	PFAS by ID	38		ng/L	40
010	AOPC9-W2-13-072021	Aqueous	PFOS	PFAS by ID	9.1		ng/L	40
011	AOPC21-W6-5-072021	Aqueous	6:2 FTS	PFAS by ID	12		ng/L	42
011	AOPC21-W6-5-072021	Aqueous	PFBS	PFAS by ID	31		ng/L	42
011	AOPC21-W6-5-072021	Aqueous	PFHpS	PFAS by ID	1.1	J	ng/L	42
011	AOPC21-W6-5-072021	Aqueous	PFPeS	PFAS by ID	8.9		ng/L	42
011	AOPC21-W6-5-072021	Aqueous	PFHxS	PFAS by ID	77		ng/L	42
011	AOPC21-W6-5-072021	Aqueous	PFBA	PFAS by ID	19		ng/L	42
011	AOPC21-W6-5-072021	Aqueous	PFHpA	PFAS by ID	2.6	J	ng/L	42
011	AOPC21-W6-5-072021	Aqueous	PFHxA	PFAS by ID	2.3	J	ng/L	42
011	AOPC21-W6-5-072021	Aqueous	PFOA	PFAS by ID	27		ng/L	42
011	AOPC21-W6-5-072021	Aqueous	PFPeA	PFAS by ID	1.7	J	ng/L	42
011	AOPC21-W6-5-072021	Aqueous	PFOS	PFAS by ID	52		ng/L	42
012	AOPC17,21-WU5-12-072021	Aqueous	6:2 FTS	PFAS by ID	3.5	JS	ng/L	44
012	AOPC17,21-WU5-12-072021	Aqueous	PFOSA	PFAS by ID	1.2	J	ng/L	44
012	AOPC17,21-WU5-12-072021	Aqueous	PFHxS	PFAS by ID	2.1	J	ng/L	44
012	AOPC17,21-WU5-12-072021	Aqueous	PFBA	PFAS by ID	3.3	J	ng/L	44
012	AOPC17,21-WU5-12-072021	Aqueous	PFHxA	PFAS by ID	1.7	J	ng/L	44
012	AOPC17,21-WU5-12-072021	Aqueous	PFOA	PFAS by ID	1.8	J	ng/L	44
012	AOPC17,21-WU5-12-072021	Aqueous	PFPeA	PFAS by ID	1.4	J	ng/L	44
014	AOPC21-WU5-10-072021	Aqueous	6:2 FTS	PFAS by ID	6.0	J	ng/L	48
014	AOPC21-WU5-10-072021	Aqueous	PFBS	PFAS by ID	2.8	J	ng/L	48
014	AOPC21-WU5-10-072021	Aqueous	PFHxS	PFAS by ID	1.0	J	ng/L	48
014	AOPC21-WU5-10-072021	Aqueous	PFBA	PFAS by ID	8.0		ng/L	48
014	AOPC21-WU5-10-072021	Aqueous	PFDA	PFAS by ID	1.7	J	ng/L	48
014	AOPC21-WU5-10-072021	Aqueous	PFHpA	PFAS by ID	2.6	J	ng/L	48
014	AOPC21-WU5-10-072021	Aqueous	PFHxA	PFAS by ID	14		ng/L	48
014	AOPC21-WU5-10-072021	Aqueous	PFNA	PFAS by ID	1.2	J	ng/L	48
014	AOPC21-WU5-10-072021	Aqueous	PFOA	PFAS by ID	8.4		ng/L	48
014	AOPC21-WU5-10-072021	Aqueous	PFPeA	PFAS by ID	11		ng/L	48
014	AOPC21-WU5-10-072021	Aqueous	PFOS	PFAS by ID	3.5	J	ng/L	48
015	AOPC21-W4-6-072021	Aqueous	6:2 FTS	PFAS by ID	60		ng/L	50
015	AOPC21-W4-6-072021	Aqueous	PFBS	PFAS by ID	8.9		ng/L	50
015	AOPC21-W4-6-072021	Aqueous	PFHxS	PFAS by ID	3.0	J	ng/L	50
015	AOPC21-W4-6-072021	Aqueous	PFBA	PFAS by ID	20		ng/L	50
015	AOPC21-W4-6-072021	Aqueous	PFDA	PFAS by ID	3.9		ng/L	50
015	AOPC21-W4-6-072021	Aqueous	PFHpA	PFAS by ID	2.8	J	ng/L	50
015	AOPC21-W4-6-072021	Aqueous	PFHxA	PFAS by ID	13		ng/L	50

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
015	AOPC21-W4-6-072021	Aqueous	PFNA	PFAS by ID	1.9	J	ng/L	50
015	AOPC21-W4-6-072021	Aqueous	PFOA	PFAS by ID	12		ng/L	50
015	AOPC21-W4-6-072021	Aqueous	PFPeA	PFAS by ID	6.6		ng/L	50
015	AOPC21-W4-6-072021	Aqueous	PFOS	PFAS by ID	6.4		ng/L	50
017	AOPC10-WGC2-13-072121	Aqueous	PFBS	PFAS by ID	16		ng/L	54
017	AOPC10-WGC2-13-072121	Aqueous	PFPeS	PFAS by ID	6.2		ng/L	54
017	AOPC10-WGC2-13-072121	Aqueous	PFHxS	PFAS by ID	17		ng/L	54
017	AOPC10-WGC2-13-072121	Aqueous	PFBA	PFAS by ID	21		ng/L	54
017	AOPC10-WGC2-13-072121	Aqueous	PFOS	PFAS by ID	1.4	J	ng/L	54
018	AOPC10-WGC2-8-072121	Aqueous	6:2 FTS	PFAS by ID	7.0		ng/L	56
018	AOPC10-WGC2-8-072121	Aqueous	PFBS	PFAS by ID	5.4		ng/L	56
018	AOPC10-WGC2-8-072121	Aqueous	PFHpS	PFAS by ID	3.1	J	ng/L	56
018	AOPC10-WGC2-8-072121	Aqueous	PFPeS	PFAS by ID	2.7	J	ng/L	56
018	AOPC10-WGC2-8-072121	Aqueous	PFHxS	PFAS by ID	37		ng/L	56
018	AOPC10-WGC2-8-072121	Aqueous	PFBA	PFAS by ID	11		ng/L	56
018	AOPC10-WGC2-8-072121	Aqueous	PFHpA	PFAS by ID	4.6		ng/L	56
018	AOPC10-WGC2-8-072121	Aqueous	PFHxA	PFAS by ID	9.2		ng/L	56
018	AOPC10-WGC2-8-072121	Aqueous	PFOA	PFAS by ID	41		ng/L	56
018	AOPC10-WGC2-8-072121	Aqueous	PFPeA	PFAS by ID	7.7		ng/L	56
018	AOPC10-WGC2-8-072121	Aqueous	PFOS	PFAS by ID	53		ng/L	56
019	AOPC10-WGC2-10-072121	Aqueous	PFBS	PFAS by ID	29		ng/L	58
019	AOPC10-WGC2-10-072121	Aqueous	PFPeS	PFAS by ID	5.1		ng/L	58
019	AOPC10-WGC2-10-072121	Aqueous	PFHxS	PFAS by ID	26		ng/L	58
019	AOPC10-WGC2-10-072121	Aqueous	PFBA	PFAS by ID	59	Q	ng/L	58
019	AOPC10-WGC2-10-072121	Aqueous	PFHpA	PFAS by ID	16		ng/L	58
019	AOPC10-WGC2-10-072121	Aqueous	PFHxA	PFAS by ID	48		ng/L	58
019	AOPC10-WGC2-10-072121	Aqueous	PFNA	PFAS by ID	2.7	J	ng/L	58
019	AOPC10-WGC2-10-072121	Aqueous	PFOA	PFAS by ID	24		ng/L	58
019	AOPC10-WGC2-10-072121	Aqueous	PFPeA	PFAS by ID	41		ng/L	58
019	AOPC10-WGC2-10-072121	Aqueous	PFOS	PFAS by ID	9.1		ng/L	58
020	AOPC10-WGC2-1-072121	Aqueous	6:2 FTS	PFAS by ID	4.4	J	ng/L	60
020	AOPC10-WGC2-1-072121	Aqueous	PFBS	PFAS by ID	18		ng/L	60
020	AOPC10-WGC2-1-072121	Aqueous	PFPeS	PFAS by ID	7.5		ng/L	60
020	AOPC10-WGC2-1-072121	Aqueous	PFHxS	PFAS by ID	26		ng/L	60
020	AOPC10-WGC2-1-072121	Aqueous	PFBA	PFAS by ID	19		ng/L	60
020	AOPC10-WGC2-1-072121	Aqueous	PFHpA	PFAS by ID	2.6	J	ng/L	60
020	AOPC10-WGC2-1-072121	Aqueous	PFHxA	PFAS by ID	8.4		ng/L	60
020	AOPC10-WGC2-1-072121	Aqueous	PFOA	PFAS by ID	4.7		ng/L	60
020	AOPC10-WGC2-1-072121	Aqueous	PFPeA	PFAS by ID	6.1		ng/L	60
020	AOPC10-WGC2-1-072121	Aqueous	PFOS	PFAS by ID	4.5		ng/L	60

(179 detections)

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-001
Description: AOPC24-W89-1-071921 | Matrix: Aqueous
Date Sampled: 07/19/2021 1210 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1726	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1722	JJG	07/30/2021 1838	10648

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	43		7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	40		3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.94	J	3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	34		3.8	1.9	0.95	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	130		3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	4.2		3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	21		3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	11		3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	13		3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	57		3.6	1.8	0.91	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		94	50-150		85	50-150
13C2_6:2FTS		114	50-150		101	50-150
13C2_8:2FTS		91	50-150		94	50-150
13C2_PFDoA		89	50-150		72	50-150
13C2_PFTeDA		93	50-150		75	50-150
13C3_PFBS		87	50-150		81	50-150
13C3_PFHxS		84	50-150		79	50-150
13C3-HFPO-DA		93	50-150		88	50-150
13C4_PFBA		95	50-150		86	50-150
13C4_PFHpA		84	50-150		85	50-150
13C5_PFHxA		86	50-150		82	50-150
13C5_PFPeA		91	50-150		88	50-150
13C6_PFDA		85	50-150		82	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-001
Description: AOPC24-W89-1-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		96	50-150		74	50-150
13C8_PFOA		100	50-150		94	50-150
13C8_PFOS		85	50-150		79	50-150
13C8_PFOSA		86	50-150		85	50-150
13C9_PFNA		93	50-150		80	50-150
d5-EtFOSAA		99	50-150		80	50-150
d3-MeFOSAA		94	50-150		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-002
Description: AOPC3-W7-3-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1758	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1732	JJG	07/30/2021 1838	10648

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	48		7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.9		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.2		3.5	1.8	0.88	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	40		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.4	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	20		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	33		3.7	1.9	0.92	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		83	50-150		93	50-150
13C2_6:2FTS		105	50-150		84	50-150
13C2_8:2FTS		82	50-150		94	50-150
13C2_PFDoA		76	50-150		74	50-150
13C2_PFTeDA		78	50-150		81	50-150
13C3_PFBS		75	50-150		82	50-150
13C3_PFHxS		86	50-150		81	50-150
13C3-HFPO-DA		85	50-150		87	50-150
13C4_PFBA		85	50-150		86	50-150
13C4_PFHpA		89	50-150		89	50-150
13C5_PFHxA		75	50-150		82	50-150
13C5_PFPeA		88	50-150		82	50-150
13C6_PFDA		81	50-150		81	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-002
Description: AOPC3-W7-3-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		89	50-150		71	50-150
13C8_PFOA		96	50-150		93	50-150
13C8_PFOS		78	50-150		83	50-150
13C8_PFOSA		83	50-150		91	50-150
13C9_PFNA		84	50-150		84	50-150
d5-EtFOSAA		82	50-150		82	50-150
d3-MeFOSAA		85	50-150		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-003
Description: AOPC3-W7-3-071921-FD | Matrix: Aqueous
Date Sampled: 07/19/2021 1430 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1808	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1108	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	28		7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.5		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.1	L	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	42		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.93	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	19		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	30		3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		94	50-150		84	50-150
13C2_6:2FTS		113	50-150		135	50-150
13C2_8:2FTS		94	50-150		87	50-150
13C2_PFDoA		79	50-150		73	50-150
13C2_PFTeDA		82	50-150		77	50-150
13C3_PFBS		88	50-150		92	50-150
13C3_PFHxS		85	50-150		81	50-150
13C3-HFPO-DA		87	50-150		95	50-150
13C4_PFBA		88	50-150		88	50-150
13C4_PFHpA		85	50-150		89	50-150
13C5_PFHxA		78	50-150		79	50-150
13C5_PFPeA		87	50-150		81	50-150
13C6_PFDA		83	50-150		79	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-003
Description: AOPC3-W7-3-071921-FD
Matrix: Aqueous
Date Sampled: 07/19/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		86	50-150		86	50-150
13C8_PFOA		95	50-150		95	50-150
13C8_PFOS		87	50-150		79	50-150
13C8_PFOSA		86	50-150		90	50-150
13C9_PFNA		88	50-150		90	50-150
d5-EtFOSAA		91	50-150		84	50-150
d3-MeFOSAA		94	50-150		86	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-003
Description: AOPC3-W7-3-071921-FD | Matrix: Aqueous
Date Sampled: 07/19/2021 1430 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1808	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1108	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	50	L	7.2	3.6	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.3		3.6	1.8	0.90	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.8	L	3.6	1.8	0.90	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	37		3.6	1.8	0.90	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	11		3.6	1.8	0.90	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.5	J	3.6	1.8	0.90	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	20		3.6	1.8	0.90	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	31		3.6	1.8	0.90	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		94	50-150		84	50-150
13C2_6:2FTS		113	50-150		135	50-150
13C2_8:2FTS		94	50-150		87	50-150
13C2_PFDoA		79	50-150		73	50-150
13C2_PFTeDA		82	50-150		77	50-150
13C3_PFBS		88	50-150		92	50-150
13C3_PFHxS		85	50-150		81	50-150
13C3-HFPO-DA		87	50-150		95	50-150
13C4_PFBA		88	50-150		88	50-150
13C4_PFHpA		85	50-150		89	50-150
13C5_PFHxA		78	50-150		79	50-150
13C5_PFPeA		87	50-150		81	50-150
13C6_PFDA		83	50-150		79	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-003
Description: AOPC3-W7-3-071921-FD
Matrix: Aqueous
Date Sampled: 07/19/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		86	50-150		86	50-150
13C8_PFOA		95	50-150		95	50-150
13C8_PFOS		87	50-150		79	50-150
13C8_PFOSA		86	50-150		90	50-150
13C9_PFNA		88	50-150		90	50-150
d5-EtFOSAA		91	50-150		84	50-150
d3-MeFOSAA		94	50-150		86	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-004
Description: AOPC3-W7-11-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1819	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1118	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.6	J	7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	8.3		7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	13		3.9	2.0	0.98	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.3	J	3.9	2.0	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	8.8	L	3.9	2.0	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	65		3.9	2.0	0.98	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.9	2.0	0.98	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.1	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.5	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.1		3.9	2.0	0.98	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	19		3.9	2.0	0.98	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.4	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	14		3.9	2.0	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	59		3.9	2.0	0.98	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		80	50-150		85	50-150
13C2_6:2FTS		96	50-150		128	50-150
13C2_8:2FTS		69	50-150		92	50-150
13C2_PFDoA		59	50-150		74	50-150
13C2_PFTeDA		61	50-150		69	50-150
13C3_PFBS		67	50-150		98	50-150
13C3_PFHxS		68	50-150		75	50-150
13C3-HFPO-DA		71	50-150		97	50-150
13C4_PFBA		73	50-150		91	50-150
13C4_PFHpA		72	50-150		93	50-150
13C5_PFHxA		66	50-150		93	50-150
13C5_PFPeA		74	50-150		86	50-150
13C6_PFDA		65	50-150		78	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-004
Description: AOPC3-W7-11-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		70	50-150		83	50-150
13C8_PFOA		80	50-150		100	50-150
13C8_PFOS		71	50-150		87	50-150
13C8_PFOSA		68	50-150		90	50-150
13C9_PFNA		74	50-150		91	50-150
d5-EtFOSAA		71	50-150		87	50-150
d3-MeFOSAA		71	50-150		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-004
Description: AOPC3-W7-11-071921 | Matrix: Aqueous
Date Sampled: 07/19/2021 1545 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1819	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1118	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	UL	7.6	3.8	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	2.7	J	7.6	3.8	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.8		3.8	1.9	0.95	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.1	J	3.8	1.9	0.95	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	7.7	L	3.8	1.9	0.95	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	60		3.8	1.9	0.95	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	10		3.8	1.9	0.95	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.3	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.1	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	18		3.8	1.9	0.95	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	5.5		3.8	1.9	0.95	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	54		3.8	1.9	0.95	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		80	50-150		85	50-150
13C2_6:2FTS		96	50-150		128	50-150
13C2_8:2FTS		69	50-150		92	50-150
13C2_PFDoA		59	50-150		74	50-150
13C2_PFTeDA		61	50-150		69	50-150
13C3_PFBS		67	50-150		98	50-150
13C3_PFHxS		68	50-150		75	50-150
13C3-HFPO-DA		71	50-150		97	50-150
13C4_PFBA		73	50-150		91	50-150
13C4_PFHpA		72	50-150		93	50-150
13C5_PFHxA		66	50-150		93	50-150
13C5_PFPeA		74	50-150		86	50-150
13C6_PFDA		65	50-150		78	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-004
Description: AOPC3-W7-11-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		70	50-150		83	50-150
13C8_PFOA		80	50-150		100	50-150
13C8_PFOS		71	50-150		87	50-150
13C8_PFOSA		68	50-150		90	50-150
13C9_PFNA		74	50-150		91	50-150
d5-EtFOSAA		71	50-150		87	50-150
d3-MeFOSAA		71	50-150		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-005
Description: AOPC03-W7-13-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1830	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1129	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	210		7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	UQ	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.6		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.93	J	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.2	JL	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	36		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	11		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.1	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.1	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.6	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	17		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	23		3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	165	50-150		110	50-150
13C2_6:2FTS		106	50-150		138	50-150
13C2_8:2FTS		88	50-150		98	50-150
13C2_PFDoA		80	50-150		79	50-150
13C2_PFTeDA		78	50-150		84	50-150
13C3_PFBS		90	50-150		99	50-150
13C3_PFHxS		89	50-150		82	50-150
13C3-HFPO-DA		94	50-150		102	50-150
13C4_PFBA		93	50-150		92	50-150
13C4_PFHpA		88	50-150		95	50-150
13C5_PFHxA		93	50-150		91	50-150
13C5_PFPeA		107	50-150		88	50-150
13C6_PFDA		82	50-150		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-005
Description: AOPC03-W7-13-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		89	50-150		90	50-150
13C8_PFOA		96	50-150		101	50-150
13C8_PFOS		84	50-150		84	50-150
13C8_PFOSA		86	50-150		87	50-150
13C9_PFNA		86	50-150		93	50-150
d5-EtFOSAA		93	50-150		90	50-150
d3-MeFOSAA		88	50-150		88	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-005
Description: AOPC03-W7-13-071921 | Matrix: Aqueous
Date Sampled: 07/19/2021 1545 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1830	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1129	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	240	L	7.4	3.7	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.3		3.7	1.9	0.92	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.9	JL	3.7	1.9	0.92	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	32		3.7	1.9	0.92	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.2		3.7	1.9	0.92	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.6	J	3.7	1.9	0.92	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	J	3.7	1.9	0.92	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.2	J	3.7	1.9	0.92	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	14		3.7	1.9	0.92	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.2	J	3.7	1.9	0.92	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	31		3.7	1.9	0.92	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	165	50-150		110	50-150
13C2_6:2FTS		106	50-150		138	50-150
13C2_8:2FTS		88	50-150		98	50-150
13C2_PFDoA		80	50-150		79	50-150
13C2_PFTeDA		78	50-150		84	50-150
13C3_PFBS		90	50-150		99	50-150
13C3_PFHxS		89	50-150		82	50-150
13C3-HFPO-DA		94	50-150		102	50-150
13C4_PFBA		93	50-150		92	50-150
13C4_PFHpA		88	50-150		95	50-150
13C5_PFHxA		93	50-150		91	50-150
13C5_PFPeA		107	50-150		88	50-150
13C6_PFDA		82	50-150		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-005
Description: AOPC03-W7-13-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		89	50-150		90	50-150
13C8_PFOA		96	50-150		101	50-150
13C8_PFOS		84	50-150		84	50-150
13C8_PFOSA		86	50-150		87	50-150
13C9_PFNA		86	50-150		93	50-150
d5-EtFOSAA		93	50-150		90	50-150
d3-MeFOSAA		88	50-150		88	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-006

Description: AOPC03-UST-MW-02-071921 | Matrix: Aqueous

Date Sampled: 07/19/2021 1425 | Project Name: NASA ARC PFAS

Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1840	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1139	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	290		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	6.1	J	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	13		3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.4	J	3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.6	L	3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	57		3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	18		3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.2	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.4	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.9	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.3	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	15		3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	5.1		3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	50		3.8	1.9	0.96	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	385	50-150	N	370	50-150
13C2_6:2FTS		128	50-150	N	188	50-150
13C2_8:2FTS		107	50-150		130	50-150
13C2_PFDoA		81	50-150		70	50-150
13C2_PFTeDA		68	50-150		64	50-150
13C3_PFBS		82	50-150		100	50-150
13C3_PFHxS		77	50-150		82	50-150
13C3-HFPO-DA		85	50-150		92	50-150
13C4_PFBA		92	50-150		94	50-150
13C4_PFHpA		90	50-150		95	50-150
13C5_PFHxA		102	50-150		103	50-150
13C5_PFPeA		110	50-150		104	50-150
13C6_PFDA		88	50-150		82	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-006
Description: AOPC03-UST-MW-02-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1425
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		90	50-150		93	50-150
13C8_PFOA		90	50-150		99	50-150
13C8_PFOS		73	50-150		83	50-150
13C8_PFOSA		84	50-150		97	50-150
13C9_PFNA		94	50-150		106	50-150
d5-EtFOSAA		106	50-150		114	50-150
d3-MeFOSAA		87	50-150		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-006
Description: AOPC03-UST-MW-02-071921 | Matrix: Aqueous
Date Sampled: 07/19/2021 1425 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1840	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1139	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	320	QL	7.8	3.9	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	UQ	7.8	3.9	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	11		3.9	2.0	0.97	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.4	J	3.9	2.0	0.97	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.4	L	3.9	2.0	0.97	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	52		3.9	2.0	0.97	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	14		3.9	2.0	0.97	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	J	3.9	2.0	0.97	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	J	3.9	2.0	0.97	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.7	J	3.9	2.0	0.97	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.7	J	3.9	2.0	0.97	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.2	J	3.9	2.0	0.97	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	15		3.9	2.0	0.97	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.9		3.9	2.0	0.97	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	41		3.9	2.0	0.97	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	385	50-150	N	370	50-150
13C2_6:2FTS		128	50-150	N	188	50-150
13C2_8:2FTS		107	50-150		130	50-150
13C2_PFDoA		81	50-150		70	50-150
13C2_PFTeDA		68	50-150		64	50-150
13C3_PFBS		82	50-150		100	50-150
13C3_PFHxS		77	50-150		82	50-150
13C3-HFPO-DA		85	50-150		92	50-150
13C4_PFBA		92	50-150		94	50-150
13C4_PFHpA		90	50-150		95	50-150
13C5_PFHxA		102	50-150		103	50-150
13C5_PFPeA		110	50-150		104	50-150
13C6_PFDA		88	50-150		82	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-006
Description: AOPC03-UST-MW-02-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1425
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		90	50-150		93	50-150
13C8_PFOA		90	50-150		99	50-150
13C8_PFOS		73	50-150		83	50-150
13C8_PFOSA		84	50-150		97	50-150
13C9_PFNA		94	50-150		106	50-150
d5-EtFOSAA		106	50-150		114	50-150
d3-MeFOSAA		87	50-150		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-007
Description: AOPC21-W4-14-071921 | Matrix: Aqueous
Date Sampled: 07/19/2021 1735 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1851	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	UQ	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	14	Q	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	UQ	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	13		3.8	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.4	J	3.8	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.4	L	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	67		3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	40		3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.5	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	8.5		3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	20		3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	3.5	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	60		3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	12		3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	70		3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	278	50-150
13C2_6:2FTS	N	226	50-150
13C2_8:2FTS	N	166	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		62	50-150
13C3_PFBS		73	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		71	50-150
13C4_PFBA		57	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		71	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		95	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-007
Description: AOPC21-W4-14-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1735
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	50-150
13C8_PFOS		74	50-150
13C8_PFOSA		73	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-008
Description: AOPC21-W6-6-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1750
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1912	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1150	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	7.8		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.9		3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	J	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.5	L	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	73		3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	17		3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	11		3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	8.3		3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	31		3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	5.7		3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	81		3.9	2.0	0.97	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		102	50-150		105	50-150
13C2_6:2FTS		103	50-150		135	50-150
13C2_8:2FTS		84	50-150		106	50-150
13C2_PFDoA		91	50-150		88	50-150
13C2_PFTeDA		89	50-150		87	50-150
13C3_PFBS		85	50-150		105	50-150
13C3_PFHxS		88	50-150		93	50-150
13C3-HFPO-DA		89	50-150		102	50-150
13C4_PFBA		94	50-150		98	50-150
13C4_PFHpA		92	50-150		98	50-150
13C5_PFHxA		86	50-150		90	50-150
13C5_PFPeA		94	50-150		96	50-150
13C6_PFDA		81	50-150		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-008
Description: AOPC21-W6-6-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1750
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		88	50-150		110	50-150
13C8_PFOA		97	50-150		104	50-150
13C8_PFOS		84	50-150		88	50-150
13C8_PFOSA		90	50-150		102	50-150
13C9_PFNA		91	50-150		99	50-150
d5-EtFOSAA		90	50-150		96	50-150
d3-MeFOSAA		89	50-150		95	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-008
Description: AOPC21-W6-6-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1750
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1912	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1150	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	34	L	7.4	3.7	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.2		3.7	1.9	0.93	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.3	J	3.7	1.9	0.93	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.1	L	3.7	1.9	0.93	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	62		3.7	1.9	0.93	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	15		3.7	1.9	0.93	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	8.6		3.7	1.9	0.93	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.5		3.7	1.9	0.93	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	29		3.7	1.9	0.93	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	5.1		3.7	1.9	0.93	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	70		3.7	1.9	0.93	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		102	50-150		105	50-150
13C2_6:2FTS		103	50-150		135	50-150
13C2_8:2FTS		84	50-150		106	50-150
13C2_PFDoA		91	50-150		88	50-150
13C2_PFTeDA		89	50-150		87	50-150
13C3_PFBS		85	50-150		105	50-150
13C3_PFHxS		88	50-150		93	50-150
13C3-HFPO-DA		89	50-150		102	50-150
13C4_PFBA		94	50-150		98	50-150
13C4_PFHpA		92	50-150		98	50-150
13C5_PFHxA		86	50-150		90	50-150
13C5_PFPeA		94	50-150		96	50-150
13C6_PFDA		81	50-150		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-008
Description: AOPC21-W6-6-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1750
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		88	50-150		110	50-150
13C8_PFOA		97	50-150		104	50-150
13C8_PFOS		84	50-150		88	50-150
13C8_PFOSA		90	50-150		102	50-150
13C9_PFNA		91	50-150		99	50-150
d5-EtFOSAA		90	50-150		96	50-150
d3-MeFOSAA		89	50-150		95	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-009
Description: FB-09-071921 | Matrix: Aqueous
Date Sampled: 07/19/2021 1600 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1923	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.6	UL	5.1	2.6	1.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		80	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		80	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG22011-009
Description: FB-09-071921		Matrix: Aqueous
Date Sampled: 07/19/2021 1600	Project Name: NASA ARC PFAS	
Date Received: 07/22/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		78	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-010
Description: AOPC9-W2-13-072021 | Matrix: Aqueous
Date Sampled: 07/20/2021 1335 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 1925	JJG	07/28/2021 1734	10346

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.9	J	7.4	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	21		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	17		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	110		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	29		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	6.2		3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	23		3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	32		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	38		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.1		3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		93	50-150
13C2_6:2FTS		79	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		80	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		76	50-150
13C7_PFUdA		87	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-010
Description: AOPC9-W2-13-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1335
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		74	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-011
Description: AOPC21-W6-5-072021 | Matrix: Aqueous
Date Sampled: 07/20/2021 1410 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 1936	JJG	07/28/2021 1734	10346

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	12		7.8	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	31		3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.1	J	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	8.9		3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	77		3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	19		3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.3	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	27		3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	52		3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		78	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		80	50-150
13C3_PFBS		77	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		73	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-011
Description: AOPC21-W6-5-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1410
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		75	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-012
Description: AOPC17,21-WU5-12-072021 | Matrix: Aqueous
Date Sampled: 07/20/2021 1420 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 1947	JJG	07/28/2021 1734	10346

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	JS	7.4	3.7	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	UQ	7.4	3.7	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.2	J	3.7	1.9	0.93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.1	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.3	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.4	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	155	50-150
13C2_6:2FTS		106	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		72	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		93	50-150
13C5_PFPeA		98	50-150
13C6_PFDA		75	50-150
13C7_PFUdA		81	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-012
Description: AOPC17,21-WU5-12-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1420
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		80	50-150
13C9_PFNA		74	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-013
Description: SWB-01-072021 | Matrix: Aqueous
Date Sampled: 07/20/2021 1430 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 2019	JJG	07/28/2021 1734	10346

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	50-150
13C2_6:2FTS		112	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		77	50-150
13C3_PFHxS		78	50-150
13C3-HFPO-DA		80	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		77	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		87	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-013
Description: SWB-01-072021			Matrix: Aqueous
Date Sampled: 07/20/2021 1430		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	50-150
13C8_PFOS		75	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		74	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-014
Description: AOPC21-WU5-10-072021 | Matrix: Aqueous
Date Sampled: 07/20/2021 1540 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1243	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.0	J	8.0	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.8	J	4.0	2.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.0	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	8.0		4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	14		4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.2	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	8.4		4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	11		4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.5	J	4.0	2.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		114	50-150
13C2_6:2FTS		127	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		71	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		73	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-014
Description: AOPC21-WU5-10-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1540
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-015
Description: AOPC21-W4-6-072021 | Matrix: Aqueous
Date Sampled: 07/20/2021 1615 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1254	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	60		7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.9		3.9	2.0	0.98	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3.0	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	20		3.9	2.0	0.98	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	3.9		3.9	2.0	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.8	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	13		3.9	2.0	0.98	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	12		3.9	2.0	0.98	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	6.6		3.9	2.0	0.98	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	6.4		3.9	2.0	0.98	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		116	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		55	50-150
13C2_PFTeDA		56	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		69	50-150
13C3-HFPO-DA		74	50-150
13C4_PFBA		75	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		73	50-150
13C5_PFPeA		72	50-150
13C6_PFDA		63	50-150
13C7_PFUdA		70	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-015
Description: AOPC21-W4-6-072021			Matrix: Aqueous
Date Sampled: 07/20/2021 1615		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	50-150
13C8_PFOS		66	50-150
13C8_PFOSA		76	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		65	50-150
d3-MeFOSAA		69	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-016
Description: FB-10-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1650
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1304	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		85	50-150
13C2_6:2FTS		149	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		65	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		92	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		79	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		79	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-016
Description: FB-10-072021			Matrix: Aqueous
Date Sampled: 07/20/2021 1650		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		101	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-017
Description: AOPC10-WGC2-13-072121 | Matrix: Aqueous
Date Sampled: 07/21/2021 0540 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1336	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	16		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	6.2		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	17		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	21		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.4	J	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		98	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		80	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-017
Description: AOPC10-WGC2-13-072121			Matrix: Aqueous
Date Sampled: 07/21/2021 0540		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-018
Description: AOPC10-WGC2-8-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1347	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	7.0		6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.4		3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	3.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.7	J	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	37		3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	11		3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	4.6		3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	9.2		3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	41		3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	7.7		3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	53		3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		103	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		69	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		69	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-018
Description: AOPC10-WGC2-8-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-019
Description: AOPC10-WGC2-10-072121 | Matrix: Aqueous
Date Sampled: 07/21/2021 0730 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1357	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	UQ	7.8	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	29		3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.1		3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	26		3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	59	Q	3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	UQ	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	16		3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	48		3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.7	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	24		3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	41		3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	UQ	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	UQ	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.1		3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	163	50-150
13C2_6:2FTS		125	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA	N	43	50-150
13C2_PFTeDA	N	25	50-150
13C3_PFBS		74	50-150
13C3_PFHxS		69	50-150
13C3-HFPO-DA		65	50-150
13C4_PFBA	N	39	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		72	50-150
13C5_PFPeA		58	50-150
13C6_PFDA		66	50-150
13C7_PFUdA		78	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-019
Description: AOPC10-WGC2-10-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0730
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	50-150
13C8_PFOS		68	50-150
13C8_PFOSA		73	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		63	50-150
d3-MeFOSAA		69	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG22011-020
Description: AOPC10-WGC2-1-072121 | Matrix: Aqueous
Date Sampled: 07/21/2021 0740 | Project Name: NASA ARC PFAS
Date Received: 07/22/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1408	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.4	J	7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	18		3.9	2.0	0.98	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	7.5		3.9	2.0	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	26		3.9	2.0	0.98	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	19		3.9	2.0	0.98	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	8.4		3.9	2.0	0.98	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.7		3.9	2.0	0.98	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	6.1		3.9	2.0	0.98	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.5		3.9	2.0	0.98	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		116	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		79	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		61	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		77	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		62	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		74	50-150
13C6_PFDA		67	50-150
13C7_PFUdA		73	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-020
Description: AOPC10-WGC2-1-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0740
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	50-150
13C8_PFOS		69	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		73	50-150
d3-MeFOSAA		70	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-021
Description: FB-11-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 1100
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1418	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		82	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		72	50-150
13C7_PFUdA		81	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-021
Description: FB-11-072121			Matrix: Aqueous
Date Sampled: 07/21/2021 1100		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		71	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ10188-001
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		76	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10188-001
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		98	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10188-002
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	18		1	122	70-150	07/28/2021 1321
11Cl-PF3OUdS	15	18		1	117	70-150	07/28/2021 1321
8:2 FTS	15	15		1	101	67-138	07/28/2021 1321
6:2 FTS	15	15		1	99	64-140	07/28/2021 1321
4:2 FTS	15	21		1	143	63-143	07/28/2021 1321
GenX	32	36		1	113	70-150	07/28/2021 1321
ADONA	15	20		1	129	70-150	07/28/2021 1321
EtFOSAA	16	18		1	113	61-135	07/28/2021 1321
MeFOSAA	16	16		1	103	65-136	07/28/2021 1321
PFBS	14	18		1	124	72-130	07/28/2021 1321
PFDS	15	17		1	113	53-142	07/28/2021 1321
PFHpS	15	20		1	133	69-134	07/28/2021 1321
PFNS	15	17		1	109	69-127	07/28/2021 1321
PFOSA	16	19		1	122	67-137	07/28/2021 1321
PFPeS	15	20	N	1	134	71-127	07/28/2021 1321
PFHxS	15	18		1	122	68-131	07/28/2021 1321
PFBA	16	20		1	123	73-129	07/28/2021 1321
PFDA	16	19		1	120	71-129	07/28/2021 1321
PFDoA	16	20		1	127	72-134	07/28/2021 1321
PFHpA	16	19		1	119	72-130	07/28/2021 1321
PFHxA	16	19		1	118	72-129	07/28/2021 1321
PFNA	16	18		1	114	69-130	07/28/2021 1321
PFOA	16	19		1	118	71-133	07/28/2021 1321
PFPeA	16	18		1	114	72-129	07/28/2021 1321
PFTeDA	16	19		1	117	71-132	07/28/2021 1321
PFTrDA	16	23		1	141	65-144	07/28/2021 1321
PFUdA	16	20		1	124	69-133	07/28/2021 1321
PFOS	15	18		1	122	65-140	07/28/2021 1321

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		66	50-150
13C2_6:2FTS		82	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		71	50-150
13C3_PFHxS		72	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		73	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		74	50-150
13C5_PFPeA		80	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10188-002
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		71	50-150
13C7_PFUdA		69	50-150
13C8_PFOA		83	50-150
13C8_PFOS		73	50-150
13C8_PFOSA		70	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		74	50-150
d3-MeFOSAA		73	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG22011-007DU
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	07/28/2021 1901
11Cl-PF3OUdS	ND	ND		1	0.00	20	07/28/2021 1901
8:2 FTS	ND	ND		1	0.00	20	07/28/2021 1901
6:2 FTS	14	13		1	11	20	07/28/2021 1901
4:2 FTS	ND	ND		1	0.00	20	07/28/2021 1901
GenX	ND	ND		1	0.00	20	07/28/2021 1901
ADONA	ND	ND		1	0.00	20	07/28/2021 1901
EtFOSAA	ND	ND		1	0.00	20	07/28/2021 1901
MeFOSAA	ND	ND		1	0.00	20	07/28/2021 1901
PFBS	13	15		1	13	20	07/28/2021 1901
PFDS	ND	ND		1	0.00	20	07/28/2021 1901
PFHpS	1.4	2.4	+	1	51	20	07/28/2021 1901
PFNS	ND	ND		1	0.00	20	07/28/2021 1901
PFOSA	ND	ND		1	0.00	20	07/28/2021 1901
PFPeS	5.4	5.4		1	0.37	20	07/28/2021 1901
PFHxS	67	66		1	2.3	20	07/28/2021 1901
PFBA	40	40		1	0.15	20	07/28/2021 1901
PFDA	2.5	2.5	J	1	1.1	20	07/28/2021 1901
PFDoA	ND	ND		1	0.00	20	07/28/2021 1901
PFHpA	8.5	8.9		1	5.6	20	07/28/2021 1901
PFHxA	20	21		1	1.7	20	07/28/2021 1901
PFNA	3.5	3.3	J	1	3.7	20	07/28/2021 1901
PFOA	60	52		1	15	20	07/28/2021 1901
PFPeA	12	ND		1	0.00	20	07/28/2021 1901
PFTeDA	ND	ND		1	0.00	20	07/28/2021 1901
PFTrDA	ND	ND		1	0.00	20	07/28/2021 1901
PFUdA	ND	ND		1	0.00	20	07/28/2021 1901
PFOS	70	74		1	6.6	20	07/28/2021 1901

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	282	50-150
13C2_6:2FTS	N	213	50-150
13C2_8:2FTS	N	166	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		61	50-150
13C3_PFBS		69	50-150
13C3_PFHxS		72	50-150
13C3-HFPO-DA		69	50-150
13C4_PFBA		58	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		72	50-150
13C5_PFPeA		75	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG22011-007DU
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		82	50-150
13C8_PFOS		70	50-150
13C8_PFOSA		74	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		108	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10346-001
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		71	50-150
13C2_6:2FTS		80	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		77	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		77	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		80	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10346-001
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		77	50-150
13C7_PFUdA		76	50-150
13C8_PFOA		78	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		77	50-150
13C9_PFNA		77	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10346-002
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	111	70-150	07/29/2021 1447
11Cl-PF3OUdS	15	15		1	97	70-150	07/29/2021 1447
8:2 FTS	15	16		1	103	67-138	07/29/2021 1447
6:2 FTS	15	16		1	103	64-140	07/29/2021 1447
4:2 FTS	15	16		1	105	63-143	07/29/2021 1447
GenX	32	34		1	105	70-150	07/29/2021 1447
ADONA	15	18		1	118	70-150	07/29/2021 1447
EtFOSAA	16	17		1	108	61-135	07/29/2021 1447
MeFOSAA	16	20		1	123	65-136	07/29/2021 1447
PFBS	14	16		1	114	72-130	07/29/2021 1447
PFDS	15	19		1	123	53-142	07/29/2021 1447
PFHpS	15	17		1	110	69-134	07/29/2021 1447
PFNS	15	14		1	92	69-127	07/29/2021 1447
PFOSA	16	17		1	105	67-137	07/29/2021 1447
PFPeS	15	19		1	125	71-127	07/29/2021 1447
PFHxS	15	16		1	108	68-131	07/29/2021 1447
PFBA	16	19		1	117	73-129	07/29/2021 1447
PFDA	16	18		1	111	71-129	07/29/2021 1447
PFDoA	16	19		1	121	72-134	07/29/2021 1447
PFHpA	16	19		1	117	72-130	07/29/2021 1447
PFHxA	16	18		1	111	72-129	07/29/2021 1447
PFNA	16	19		1	116	69-130	07/29/2021 1447
PFOA	16	19		1	119	71-133	07/29/2021 1447
PFPeA	16	18		1	114	72-129	07/29/2021 1447
PFTeDA	16	19		1	116	71-132	07/29/2021 1447
PFTrDA	16	21		1	130	65-144	07/29/2021 1447
PFUdA	16	18		1	113	69-133	07/29/2021 1447
PFOS	15	16		1	109	65-140	07/29/2021 1447

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		74	50-150
13C2_6:2FTS		83	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10346-002
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		85	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		78	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		78	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG22011-012MS
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	16		1	112	70-150	07/30/2021 1957
11Cl-PF3OUdS	ND	14	14		1	100	70-150	07/30/2021 1957
8:2 FTS	ND	15	15		1	105	67-138	07/30/2021 1957
6:2 FTS	3.5	14	25	N	1	150	64-140	07/30/2021 1957
4:2 FTS	ND	14	15		1	109	63-143	07/30/2021 1957
GenX	ND	30	33		1	109	70-150	07/30/2021 1957
ADONA	ND	14	18		1	123	70-150	07/30/2021 1957
EtFOSAA	ND	15	16		1	107	61-135	07/30/2021 1957
MeFOSAA	ND	15	20		1	132	65-136	07/30/2021 1957
PFBS	ND	13	17		1	123	72-130	07/30/2021 1957
PFDS	ND	15	17		1	113	53-142	07/30/2021 1957
PFHpS	ND	14	18		1	126	69-134	07/30/2021 1957
PFNS	ND	15	18		1	125	69-127	07/30/2021 1957
PFOSA	1.2	15	16		1	100	67-137	07/30/2021 1957
PFPeS	ND	14	15		1	106	71-127	07/30/2021 1957
PFHxS	2.1	14	18		1	113	68-131	07/30/2021 1957
PFBA	3.3	15	20		1	113	73-129	07/30/2021 1957
PFDA	ND	15	18		1	118	71-129	07/30/2021 1957
PFDoA	ND	15	18		1	117	72-134	07/30/2021 1957
PFHpA	ND	15	17		1	113	72-130	07/30/2021 1957
PFHxA	1.7	15	19		1	111	72-129	07/30/2021 1957
PFNA	ND	15	17		1	115	69-130	07/30/2021 1957
PFOA	1.8	15	20		1	123	71-133	07/30/2021 1957
PFPeA	1.4	15	19		1	114	72-129	07/30/2021 1957
PFTeDA	ND	15	17		1	110	71-132	07/30/2021 1957
PFTrDA	ND	15	19		1	128	65-144	07/30/2021 1957
PFUdA	ND	15	16		1	104	69-133	07/30/2021 1957
PFOS	ND	14	16		1	115	65-140	07/30/2021 1957

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	155	50-150
13C2_6:2FTS		95	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG22011-012MS
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		74	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		79	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		80	50-150
13C9_PFNA		75	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		102	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG22011-012MD
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	14	15		1	106	8.6	70-150	30	07/30/2021 2008
11Cl-PF3OUdS	ND	14	14		1	103	0.21	70-150	30	07/30/2021 2008
8:2 FTS	ND	14	15		1	104	3.8	67-138	30	07/30/2021 2008
6:2 FTS	3.5	14	15	+	1	84	48	64-140	30	07/30/2021 2008
4:2 FTS	ND	14	15		1	107	4.1	63-143	30	07/30/2021 2008
GenX	ND	30	33		1	111	0.86	70-150	30	07/30/2021 2008
ADONA	ND	14	16		1	111	13	70-150	30	07/30/2021 2008
EtFOSAA	ND	15	15		1	98	11	61-135	30	07/30/2021 2008
MeFOSAA	ND	15	19		1	131	3.1	65-136	30	07/30/2021 2008
PFBS	ND	13	14		1	108	15	72-130	30	07/30/2021 2008
PFDS	ND	14	16		1	113	2.8	53-142	30	07/30/2021 2008
PFHpS	ND	14	15		1	108	17	69-134	30	07/30/2021 2008
PFNS	ND	14	16		1	114	12	69-127	30	07/30/2021 2008
PFOSA	1.2	15	16		1	98	4.1	67-137	30	07/30/2021 2008
PFPeS	ND	14	15		1	109	0.17	71-127	30	07/30/2021 2008
PFHxS	2.1	13	17		1	114	2.2	68-131	30	07/30/2021 2008
PFBA	3.3	15	17		1	95	16	73-129	30	07/30/2021 2008
PFDA	ND	15	18		1	119	1.7	71-129	30	07/30/2021 2008
PFDoA	ND	15	18		1	122	1.9	72-134	30	07/30/2021 2008
PFHpA	ND	15	15		1	100	15	72-130	30	07/30/2021 2008
PFHxA	1.7	15	17		1	101	11	72-129	30	07/30/2021 2008
PFNA	ND	15	18		1	124	5.3	69-130	30	07/30/2021 2008
PFOA	1.8	15	19		1	117	6.3	71-133	30	07/30/2021 2008
PFPeA	1.4	15	17		1	102	12	72-129	30	07/30/2021 2008
PFTeDA	ND	15	16		1	109	4.0	71-132	30	07/30/2021 2008
PFTrDA	ND	15	21		1	141	7.1	65-144	30	07/30/2021 2008
PFUdA	ND	15	16		1	110	2.9	69-133	30	07/30/2021 2008
PFOS	ND	14	17		1	121	3.1	65-140	30	07/30/2021 2008

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Sample ID: WG22011-012MD
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		77	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		80	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		71	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10452-001
Batch: 10452
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1100

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		134	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		103	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10452-001
Batch: 10452
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1100

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	50-150
13C7_PFUdA		103	50-150
13C8_PFOA		93	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		89	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10452-002
Batch: 10452
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1100

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	110	70-150	08/03/2021 1233
11Cl-PF3OUdS	15	15		1	100	70-150	08/03/2021 1233
8:2 FTS	15	15		1	100	67-138	08/03/2021 1233
6:2 FTS	15	14		1	90	64-140	08/03/2021 1233
4:2 FTS	15	18		1	121	63-143	08/03/2021 1233
GenX	32	46		1	143	70-150	08/03/2021 1233
ADONA	15	18		1	118	70-150	08/03/2021 1233
EtFOSAA	16	17		1	106	61-135	08/03/2021 1233
MeFOSAA	16	20		1	125	65-136	08/03/2021 1233
PFBS	14	16		1	110	72-130	08/03/2021 1233
PFDS	15	18		1	118	53-142	08/03/2021 1233
PFHpS	15	17		1	109	69-134	08/03/2021 1233
PFNS	15	14		1	94	69-127	08/03/2021 1233
PFOSA	16	17		1	108	67-137	08/03/2021 1233
PFPeS	15	18		1	120	71-127	08/03/2021 1233
PFHxS	15	15		1	104	68-131	08/03/2021 1233
PFBA	16	17		1	109	73-129	08/03/2021 1233
PFDA	16	17		1	105	71-129	08/03/2021 1233
PFDoA	16	17		1	108	72-134	08/03/2021 1233
PFHpA	16	14		1	89	72-130	08/03/2021 1233
PFHxA	16	19		1	117	72-129	08/03/2021 1233
PFNA	16	21		1	130	69-130	08/03/2021 1233
PFOA	16	17		1	109	71-133	08/03/2021 1233
PFPeA	16	17		1	105	72-129	08/03/2021 1233
PFTeDA	16	17		1	108	71-132	08/03/2021 1233
PFTrDA	16	16		1	99	65-144	08/03/2021 1233
PFUdA	16	17		1	107	69-133	08/03/2021 1233
PFOS	15	15		1	102	65-140	08/03/2021 1233

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		82	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		73	50-150
13C5_PFPeA		76	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10452-002
Batch: 10452
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1100

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		71	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		85	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		72	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		69	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10648-001
Batch: 10648
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/30/2021 1838

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1626

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		73	50-150
13C2_6:2FTS		84	50-150
13C2_8:2FTS		74	50-150
13C2_PFDoA		68	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		70	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		74	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		72	50-150
13C5_PFPeA		78	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		71	50-150
13C8_PFOA		78	50-150
13C8_PFOS		66	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		75	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		73	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10648-002
Batch: 10648
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/30/2021 1838

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
PFPeS	15	15		1	102	71-127	07/31/2021 1637

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		79	50-150
13C2_6:2FTS		75	50-150
13C2_8:2FTS		80	50-150
13C2_PFDoA		70	50-150
13C2_PFTeDA		73	50-150
13C3_PFBS		70	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		74	50-150
13C4_PFHpA		69	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		76	50-150
13C8_PFOA		77	50-150
13C8_PFOS		72	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		76	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		72	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS - MB

Sample ID: WQ10675-001
Batch: 10675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2021 1209

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10675-001
Batch: 10675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2021 1209

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		96	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10675-002
Batch: 10675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2021 1209

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	94	70-150	08/04/2021 1753
11Cl-PF3OUdS	15	15		1	100	70-150	08/04/2021 1753
8:2 FTS	15	15		1	96	67-138	08/04/2021 1753
6:2 FTS	15	52	N	1	340	64-140	08/04/2021 1753
4:2 FTS	15	14		1	92	63-143	08/04/2021 1753
GenX	32	31		1	98	70-150	08/04/2021 1753
ADONA	15	15		1	102	70-150	08/04/2021 1753
EtFOSAA	16	14		1	90	61-135	08/04/2021 1753
MeFOSAA	16	15		1	94	65-136	08/04/2021 1753
PFBS	14	17		1	121	72-130	08/04/2021 1753
PFDS	15	16		1	101	53-142	08/04/2021 1753
PFHpS	15	15		1	99	69-134	08/04/2021 1753
PFNS	15	15		1	99	69-127	08/04/2021 1753
PFOSA	16	14		1	90	67-137	08/04/2021 1753
PFPeS	15	19	N	1	129	71-127	08/04/2021 1753
PFHxS	15	15		1	100	68-131	08/04/2021 1753
PFBA	16	17		1	103	73-129	08/04/2021 1753
PFDA	16	18		1	113	71-129	08/04/2021 1753
PFDoA	16	17		1	103	72-134	08/04/2021 1753
PFHpA	16	16		1	101	72-130	08/04/2021 1753
PFHxA	16	16		1	102	72-129	08/04/2021 1753
PFNA	16	17		1	108	69-130	08/04/2021 1753
PFOA	16	15		1	94	71-133	08/04/2021 1753
PFPeA	16	14		1	90	72-129	08/04/2021 1753
PFTeDA	16	15		1	94	71-132	08/04/2021 1753
PFTrDA	16	16		1	100	65-144	08/04/2021 1753
PFUdA	16	19		1	121	69-133	08/04/2021 1753
PFOS	15	16		1	106	65-140	08/04/2021 1753

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		114	50-150
13C2_6:2FTS		103	50-150
13C2_8:2FTS		107	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		107	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		107	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10675-002
Batch: 10675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2021 1209

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		97	50-150
13C8_PFOS		95	50-150
13C8_PFOSA		111	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122954

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x Cam Mua RCMa	Analysis (Attach list if more space is needed)	Page 1 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves Ryan Melendez		
Project Name: NASA ARC PFAS			WG22011
Project No.: 103IG667601; P.O. No.			KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Ice Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 kg	Field Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC24-W89-1-071921	7/19/21	1210	G	X			2							X	
AOPC3-W7-3-071921	7/19/21	1430	G	X			2							X	
AOPC3-W7-3-071921-FD	7/19/21	1430	G	X			2							X	Field duplicate
AOPC3-W7-11-071921	7/19/21	1545	G	X			2							X	
AOPC03-W7-13-071921	7/19/21	1545	G	X			2							X	
AOPC03-UST-MW-02-071921	7/19/21	1425	G	X			2							X	
AOPC21-W4-14-071921	7/19/21	1735	G	X			2							X	
AOPC21-W6-6-071921	7/19/21	1750	G	X			2							X	
FB-09-071921	7/19/21	1600	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TE Cam Mua	7/21/21	1130	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fred Ex	7/22/21	915	4. Laboratory received by: Jacqueline Snow	7/22/21	915

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack
Receipt Temp. 2.1 °C
Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122956

Client: Tetra Tech
Address: 1999 Harrison St.
City: Oakland | State: CA | Zip Code: 94612
Project Name: NASA ARC PFAS
Project No.: 10316667601 | P.O. No.:

Report to Contact: Mike Dahlquist
Sampler's Signature: x [signature]
Printed Name: Callie Neaves, Ryan Melendez, Elaia McDonald

Telephone No. / E-mail: (510)302-6310 / Mike.Dahlquist@tetratech.com
Analysis (Attach list if more space is needed)

Quote No.:
Page 2 of 3

WG22011
KES2

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	SO4 NH	Field Filtered	PFAS (QSMB-15)	Remarks / Cooler I.D.
AOPC9-W2-13-072021	7/20/21	1335	G	X			2							X	
AOPC21-W6-5-072021	↓	1410	↓	↓			2							X	
AOPC17,21-WU5-12-072021	↓	1420	↓	↓			6							X	MS/MSD
SWB-01-072021	↓	1430	↓	↓			2							X	
AOPC21-WU5-10-072021	↓	1540	↓	↓			2							X	
AOPC21-W4-6-072021	↓	1615	↓	↓			2							X	
FB-10-072021	↓	1650	↓	↓			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)
Sample Disposal ☐ Return to Client ☐ Disposal by Lab
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	7/21/21	1130	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fed Ex	7/22/21	915	4. Laboratory received by: [signature]	7/22/21	915

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack | Receipt Temp. 21 °C | Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122957

Client: Tetra Tech
Address: 1999 Harrison St.
City: Oakland State: CA Zip Code: 94612
Project Name: NASA ARC PFAS
Project No.: 103IG667601
P.O. No.:

Report to Contact: Mike Dahlquist
Sampler's Signature: x [signature] R. Mel
Printed Name: Callie Neaves Ryan Melendez

Telephone No. / E-mail: (510)302-6310 / Mike.Dahlquist@tetratech.com
Analysis (Attach list if more space is needed)

Quote No.:
Page 3 of 3

WG22011
KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G-Grab Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	HNO3	HNO3	HCl	NaOH	NaOH	Field Filtered	PFAS (QSM B-15)								Remarks / Cooler I.D.
AOPC10-WGC2-13-072121	7/21/21	0540	G	X			2							X								
AOPC10-WGC2-8-072121	7/21/21	0545	G	X			2							X								
AOPC10-WGC2-10-072121	7/21/21	0730	G	X			2							X								
AOPC10-WGC2-1-072121	7/21/21	0740	G	X			2							X								
FB-11-072121	7/21/21	1100	G	X			2							X								

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)
Sample Disposal ☐ Return to Client ☐ Disposal by Lab
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	7/21/21	1130	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fed Ex	7/22/21	915	4. Laboratory received by: [signature]	7/22/21	915

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 2.1 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PaceAnalytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: JSM / 07/22/2021 Lot #: WG22011

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

2.1 / 2.1 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JSM Date: 07/22/2021

Comments:

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dalquist

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Lot Number:**WG24008**

Date Completed:08/09/2021

08/09/2021 12:05 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Case Narrative
Tetra Tech
Lot Number: WG24008

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

The continuing calibration verification (CCV) associated with samples WG24008-003, WG24008-004, WG24008-005 for analytes: 6:2-FTS recovered above the upper control limit. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

The MS/MSD associated with sample WG24008-005 had multiple analytes recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample Summary

Tetra Tech

Lot Number: WG24008

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC20-SW01-EF-072221	Aqueous	07/22/2021 0940	07/24/2021
002	AOPC13-SW01-IN-072221	Aqueous	07/22/2021 1010	07/24/2021
003	AOPC13-SW01-EF-072221	Aqueous	07/22/2021 1015	07/24/2021
004	AOPC13-SW01-EF-072221-FD	Aqueous	07/22/2021 1015	07/24/2021
005	AOPC15-SW01-EF-072321	Aqueous	07/23/2021 0920	07/24/2021
006	AOPC15-SW01-IN-072321	Aqueous	07/23/2021 0925	07/24/2021

(6 samples)

Detection Summary

Tetra Tech

Lot Number: WG24008

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	AOPC20-SW01-EF-072221	Aqueous	6:2 FTS	PFAS by ID	5.3	J	ng/L	5
001	AOPC20-SW01-EF-072221	Aqueous	PFBS	PFAS by ID	60		ng/L	5
001	AOPC20-SW01-EF-072221	Aqueous	PFHpS	PFAS by ID	12		ng/L	5
001	AOPC20-SW01-EF-072221	Aqueous	PFPeS	PFAS by ID	50		ng/L	5
001	AOPC20-SW01-EF-072221	Aqueous	PFHxS	PFAS by ID	230		ng/L	5
001	AOPC20-SW01-EF-072221	Aqueous	PFBA	PFAS by ID	25		ng/L	5
001	AOPC20-SW01-EF-072221	Aqueous	PFHpA	PFAS by ID	11		ng/L	5
001	AOPC20-SW01-EF-072221	Aqueous	PFHxA	PFAS by ID	58		ng/L	5
001	AOPC20-SW01-EF-072221	Aqueous	PFOA	PFAS by ID	36		ng/L	5
001	AOPC20-SW01-EF-072221	Aqueous	PFPeA	PFAS by ID	23		ng/L	5
001	AOPC20-SW01-EF-072221	Aqueous	PFOS	PFAS by ID	210		ng/L	5
002	AOPC13-SW01-IN-072221	Aqueous	6:2 FTS	PFAS by ID	4300		ng/L	7
002	AOPC13-SW01-IN-072221	Aqueous	PFBS	PFAS by ID	310		ng/L	7
002	AOPC13-SW01-IN-072221	Aqueous	PFHpS	PFAS by ID	180	J	ng/L	7
002	AOPC13-SW01-IN-072221	Aqueous	PFPeS	PFAS by ID	330		ng/L	7
002	AOPC13-SW01-IN-072221	Aqueous	PFHxS	PFAS by ID	2600		ng/L	7
002	AOPC13-SW01-IN-072221	Aqueous	PFBA	PFAS by ID	260		ng/L	7
002	AOPC13-SW01-IN-072221	Aqueous	PFHpA	PFAS by ID	160	J	ng/L	7
002	AOPC13-SW01-IN-072221	Aqueous	PFHxA	PFAS by ID	1600		ng/L	7
002	AOPC13-SW01-IN-072221	Aqueous	PFOA	PFAS by ID	330		ng/L	7
002	AOPC13-SW01-IN-072221	Aqueous	PFPeA	PFAS by ID	620		ng/L	7
002	AOPC13-SW01-IN-072221	Aqueous	PFOS	PFAS by ID	6800		ng/L	7
003	AOPC13-SW01-EF-072221	Aqueous	PFOS	PFAS by ID	2.5	J	ng/L	9
004	AOPC13-SW01-EF-072221-FD	Aqueous	PFOA	PFAS by ID	0.97	J	ng/L	11
004	AOPC13-SW01-EF-072221-FD	Aqueous	PFOS	PFAS by ID	4.1		ng/L	11
005	AOPC15-SW01-EF-072321	Aqueous	PFBA	PFAS by ID	3.9	J	ng/L	13
006	AOPC15-SW01-IN-072321	Aqueous	8:2 FTS	PFAS by ID	2.0	J	ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	6:2 FTS	PFAS by ID	6.9	J	ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	PFBS	PFAS by ID	12		ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	PFHpS	PFAS by ID	1.4	J	ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	PFPeS	PFAS by ID	8.3		ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	PFHxS	PFAS by ID	48		ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	PFBA	PFAS by ID	9.7		ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	PFHpA	PFAS by ID	6.4		ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	PFHxA	PFAS by ID	20		ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	PFOA	PFAS by ID	17		ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	PFPeA	PFAS by ID	19		ng/L	15
006	AOPC15-SW01-IN-072321	Aqueous	PFOS	PFAS by ID	47		ng/L	15

(38 detections)

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24008-001
Description: AOPC20-SW01-EF-072221 | Matrix: Aqueous
Date Sampled: 07/22/2021 0940 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1643	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/05/2021 1905	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.3	J	7.0	3.5	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	60		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	12		3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	50		3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	230		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	25		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	11		3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	58		3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	36		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	23		3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	210		3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		94	50-150		102	50-150
13C2_6:2FTS		100	50-150		111	50-150
13C2_8:2FTS		78	50-150		94	50-150
13C2_PFDoA		73	50-150		94	50-150
13C2_PFTeDA		72	50-150		86	50-150
13C3_PFBS		75	50-150		88	50-150
13C3_PFHxS		78	50-150		89	50-150
13C3-HFPO-DA		91	50-150		102	50-150
13C4_PFBA		78	50-150		90	50-150
13C4_PFHpA		79	50-150		95	50-150
13C5_PFHxA		78	50-150		98	50-150
13C5_PFPeA		82	50-150		101	50-150
13C6_PFDA		79	50-150		92	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-001
Description: AOPC20-SW01-EF-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 0940
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		81	50-150		89	50-150
13C8_PFOA		85	50-150		102	50-150
13C8_PFOS		79	50-150		97	50-150
13C8_PFOSA		81	50-150		104	50-150
13C9_PFNA		77	50-150		93	50-150
d5-EtFOSAA		85	50-150		99	50-150
d3-MeFOSAA		80	50-150		103	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24008-002
Description: AOPC13-SW01-IN-072221 | Matrix: Aqueous
Date Sampled: 07/22/2021 1010 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	50	08/04/2021 1954	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	50	08/05/2021 2030	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	200	U	400	200	100	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	200	U	400	200	100	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	200	U	400	200	100	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4300		400	200	100	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	200	U	400	200	100	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	200	U	400	200	100	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	200	U	400	200	100	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	200	U	400	200	100	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	200	U	400	200	100	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	310		200	100	50	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	180	J	200	100	50	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	330		200	100	50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2600		200	100	50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	260		200	100	50	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	160	J	200	100	50	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1600		200	100	50	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	330		200	100	50	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	620		200	100	50	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	6800		200	100	50	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		110	50-150		113	50-150
13C2_6:2FTS		105	50-150		113	50-150
13C2_8:2FTS		102	50-150		126	50-150
13C2_PFDoA		99	50-150		122	50-150
13C2_PFTeDA		104	50-150		119	50-150
13C3_PFBS		97	50-150		108	50-150
13C3_PFHxS		99	50-150		114	50-150
13C3-HFPO-DA		110	50-150		122	50-150
13C4_PFBA		104	50-150		116	50-150
13C4_PFHpA		102	50-150		120	50-150
13C5_PFHxA		102	50-150		116	50-150
13C5_PFPeA		101	50-150		119	50-150
13C6_PFDA		99	50-150		123	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-002
Description: AOPC13-SW01-IN-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1010
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		107	50-150		121	50-150
13C8_PFOA		106	50-150		113	50-150
13C8_PFOS		106	50-150		116	50-150
13C8_PFOSA		109	50-150		127	50-150
13C9_PFNA		107	50-150		113	50-150
d5-EtFOSAA		112	50-150		125	50-150
d3-MeFOSAA		104	50-150		139	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24008-003
Description: AOPC13-SW01-EF-072221 | Matrix: Aqueous
Date Sampled: 07/22/2021 1015 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1654	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.5	J	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		85	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		77	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		77	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		79	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-003
Description: AOPC13-SW01-EF-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1015
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		74	50-150
13C8_PFOSA		80	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-004
Description: AOPC13-SW01-EF-072221-FD
Matrix: Aqueous
Date Sampled: 07/22/2021 1015
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1704	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.97	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.1		3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		90	50-150
13C2_6:2FTS		114	50-150
13C2_8:2FTS		84	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		86	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-004
Description: AOPC13-SW01-EF-072221-FD
Matrix: Aqueous
Date Sampled: 07/22/2021 1015
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24008-005
Description: AOPC15-SW01-EF-072321 | Matrix: Aqueous
Date Sampled: 07/23/2021 0920 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1715	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	US	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.9	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	US	4.0	2.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		109	50-150
13C2_8:2FTS		78	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		71	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		85	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-005
Description: AOPC15-SW01-EF-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 0920
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24008-006
Description: AOPC15-SW01-IN-072321 | Matrix: Aqueous
Date Sampled: 07/23/2021 0925 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1840	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/05/2021 1915	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	2.0	J	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.9	J	7.4	3.7	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	12		3.7	1.9	0.93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.4	J	3.7	1.9	0.93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	8.3		3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	48		3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.7		3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	6.4		3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	20		3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	17		3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	19		3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	47		3.7	1.9	0.93	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		93	50-150		102	50-150
13C2_6:2FTS		86	50-150		95	50-150
13C2_8:2FTS		81	50-150		91	50-150
13C2_PFDoA		74	50-150		87	50-150
13C2_PFTeDA		74	50-150		83	50-150
13C3_PFBS		78	50-150		78	50-150
13C3_PFHxS		74	50-150		83	50-150
13C3-HFPO-DA		84	50-150		96	50-150
13C4_PFBA		84	50-150		91	50-150
13C4_PFHpA		83	50-150		94	50-150
13C5_PFHxA		76	50-150		92	50-150
13C5_PFPeA		82	50-150		88	50-150
13C6_PFDA		82	50-150		89	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-006
Description: AOPC15-SW01-IN-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 0925
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		80	50-150		82	50-150
13C8_PFOA		86	50-150		90	50-150
13C8_PFOS		75	50-150		88	50-150
13C8_PFOSA		79	50-150		95	50-150
13C9_PFNA		77	50-150		90	50-150
d5-EtFOSAA		78	50-150		94	50-150
d3-MeFOSAA		80	50-150		100	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ10417-001
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	50-150
13C2_6:2FTS		87	50-150
13C2_8:2FTS		75	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10417-001
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		73	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		80	50-150
13C8_PFOS		74	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10417-002
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	99	70-150	07/31/2021 1906
11Cl-PF3OUdS	15	14		1	94	70-150	07/31/2021 1906
8:2 FTS	15	12		1	78	67-138	07/31/2021 1906
6:2 FTS	15	13		1	88	64-140	07/31/2021 1906
4:2 FTS	15	14		1	92	63-143	07/31/2021 1906
GenX	32	33		1	102	70-150	07/31/2021 1906
ADONA	15	16		1	107	70-150	07/31/2021 1906
EtFOSAA	16	17		1	104	61-135	07/31/2021 1906
MeFOSAA	16	16		1	102	65-136	07/31/2021 1906
PFBS	14	16		1	113	72-130	07/31/2021 1906
PFDS	15	14		1	92	53-142	07/31/2021 1906
PFHpS	15	16		1	102	69-134	07/31/2021 1906
PFNS	15	15		1	99	69-127	07/31/2021 1906
PFOSA	16	15		1	96	67-137	07/31/2021 1906
PFPeS	15	15		1	103	71-127	07/31/2021 1906
PFHxS	15	15		1	104	68-131	07/31/2021 1906
PFBA	16	17		1	107	73-129	07/31/2021 1906
PFDA	16	17		1	103	71-129	07/31/2021 1906
PFDoA	16	18		1	115	72-134	07/31/2021 1906
PFHpA	16	17		1	107	72-130	07/31/2021 1906
PFHxA	16	17		1	108	72-129	07/31/2021 1906
PFNA	16	18		1	111	69-130	07/31/2021 1906
PFOA	16	18		1	113	71-133	07/31/2021 1906
PFPeA	16	18		1	114	72-129	07/31/2021 1906
PFTeDA	16	17		1	105	71-132	07/31/2021 1906
PFTrDA	16	19		1	120	65-144	07/31/2021 1906
PFUdA	16	18		1	113	69-133	07/31/2021 1906
PFOS	15	14		1	96	65-140	07/31/2021 1906

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	50-150
13C2_6:2FTS		85	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		76	50-150
13C5_PFPeA		77	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10417-002
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	50-150
13C7_PFUdA		74	50-150
13C8_PFOA		84	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG24008-005MS
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	15	16		1	111	70-150	08/04/2021 1725
11Cl-PF3OUdS	ND	15	16		1	108	70-150	08/04/2021 1725
8:2 FTS	ND	15	16		1	104	67-138	08/04/2021 1725
6:2 FTS	ND	15	9.9		1	66	64-140	08/04/2021 1725
4:2 FTS	ND	15	13		1	90	63-143	08/04/2021 1725
GenX	ND	31	30		1	95	70-150	08/04/2021 1725
ADONA	ND	15	17		1	112	70-150	08/04/2021 1725
EtFOSAA	ND	16	15		1	94	61-135	08/04/2021 1725
MeFOSAA	ND	16	17		1	109	65-136	08/04/2021 1725
PFBS	ND	14	15		1	105	72-130	08/04/2021 1725
PFDS	ND	15	15		1	100	53-142	08/04/2021 1725
PFHpS	ND	15	17		1	113	69-134	08/04/2021 1725
PFNS	ND	15	14		1	95	69-127	08/04/2021 1725
PFOSA	ND	16	15		1	92	67-137	08/04/2021 1725
PFPeS	ND	15	16		1	107	71-127	08/04/2021 1725
PFHxS	ND	14	16		1	110	68-131	08/04/2021 1725
PFBA	3.9	16	21		1	107	73-129	08/04/2021 1725
PFDA	ND	16	16		1	104	71-129	08/04/2021 1725
PFDoA	ND	16	17		1	110	72-134	08/04/2021 1725
PFHpA	ND	16	15		1	98	72-130	08/04/2021 1725
PFHxA	ND	16	16		1	99	72-129	08/04/2021 1725
PFNA	ND	16	17		1	107	69-130	08/04/2021 1725
PFOA	ND	16	18		1	112	71-133	08/04/2021 1725
PFPeA	ND	16	16		1	102	72-129	08/04/2021 1725
PFTeDA	ND	16	16		1	104	71-132	08/04/2021 1725
PFTrDA	ND	16	19		1	119	65-144	08/04/2021 1725
PFUdA	ND	16	17		1	110	69-133	08/04/2021 1725
PFOS	ND	15	17		1	117	65-140	08/04/2021 1725

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		77	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		76	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG24008-005MS
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	50-150
13C7_PFUdA		83	50-150
13C8_PFOA		93	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG24008-005MD
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	15	14		1	98	12	70-150	30	08/04/2021 1736
11Cl-PF3OUdS	ND	15	15		1	100	7.9	70-150	30	08/04/2021 1736
8:2 FTS	ND	15	14		1	96	8.4	67-138	30	08/04/2021 1736
6:2 FTS	ND	15	19	+	1	129	65	64-140	30	08/04/2021 1736
4:2 FTS	ND	15	14		1	98	8.5	63-143	30	08/04/2021 1736
GenX	ND	31	28		1	89	5.9	70-150	30	08/04/2021 1736
ADONA	ND	15	16		1	110	2.1	70-150	30	08/04/2021 1736
EtFOSAA	ND	16	16		1	101	7.2	61-135	30	08/04/2021 1736
MeFOSAA	ND	16	17		1	110	1.4	65-136	30	08/04/2021 1736
PFBS	ND	14	15		1	108	2.8	72-130	30	08/04/2021 1736
PFDS	ND	15	14		1	91	9.3	53-142	30	08/04/2021 1736
PFHpS	ND	15	18		1	117	3.2	69-134	30	08/04/2021 1736
PFNS	ND	15	15		1	102	7.0	69-127	30	08/04/2021 1736
PFOSA	ND	16	17		1	107	15	67-137	30	08/04/2021 1736
PFPeS	ND	15	15		1	104	2.8	71-127	30	08/04/2021 1736
PFHxS	ND	14	20	N	1	142	26	68-131	30	08/04/2021 1736
PFBA	3.9	16	21		1	108	0.90	73-129	30	08/04/2021 1736
PFDA	ND	16	17		1	105	1.5	71-129	30	08/04/2021 1736
PFDoA	ND	16	17		1	106	3.4	72-134	30	08/04/2021 1736
PFHpA	ND	16	16		1	103	5.1	72-130	30	08/04/2021 1736
PFHxA	ND	16	20		1	129	26	72-129	30	08/04/2021 1736
PFNA	ND	16	17		1	105	2.0	69-130	30	08/04/2021 1736
PFOA	ND	16	18		1	115	2.3	71-133	30	08/04/2021 1736
PFPeA	ND	16	17		1	111	8.0	72-129	30	08/04/2021 1736
PFTeDA	ND	16	16		1	103	0.78	71-132	30	08/04/2021 1736
PFTrDA	ND	16	18		1	112	5.9	65-144	30	08/04/2021 1736
PFUdA	ND	16	19		1	120	8.7	69-133	30	08/04/2021 1736
PFOS	ND	15	23	N	1	159	30	65-140	30	08/04/2021 1736

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		123	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG24008-005MD
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		80	50-150
13C8_PFOA		96	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122964

Client: Tetra Tech
Address: 1999 Harrison St.
City: Oakland State: CA Zip Code: 94612
Project Name: NASA ARC PFAS
Project No.: 103IG667601
P.O. No.:

Report to Contact: Mike Dahlquist
Sampler's Signature: x [signature]
Printed Name: Callie Neaves

Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com
Analysis (Attach list if more space is needed)

Quote No.:
Page 1 of 1

WG24008
KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Deprex	HCSO4	HNO3	HCl	NaOH	5025 Kg	Field Filtered	PFAS (DSMB-F)	Remarks / Cooler I.D.
AOPC20-SW01-EF-072221	7/22/21	0940	G	x			2							X	
AOPC13-SW01-IN-072221	7/22/21	1010	G	x			2							X	
AOPC13-SW01-EF-072221	7/22/21	1015	G	x			2							X	
AOPC13-SW01-EF-072221-FD	7/22/21	1015	G	x			2							X	Field duplicate
AOPC15-SW01-EF-072321	7/23/21	0920	G	x			6							X	MS/MSD
AOPC15-SW01-IN-072321	7/23/21	0925	G	x			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time
1. Relinquished by: Callie Neaves TE [signature]	7/23/21	1500
2. Relinquished by:		
3. Relinquished by:		
4. Relinquished by: FED EX	7/24/21	940

	Date	Time
1. Received by:		
2. Received by:		
3. Received by:		
4. Laboratory received by: [signature]	7/24/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack
Receipt Temp. 4.8 °C
Temp Blank ☒ Y ☐ N

Document Number: ME003N2-01

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: TETRA TECH | Cooler Inspected by/date: JSM / 07/24/2021 | Lot #: WG24008

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: ____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA | Chlorine Strip ID: NA | Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt: | %Solid Snap-Cup ID: NA

4.8 / 4.8 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? ____
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote # NA

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA ____ were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA ____ were received with bubbles >6 mm in diameter.

Samples(s) NA ____ were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JSM Date: 07/24/2021

Comments:

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dahlquist

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Lot Number:**WG24009**

Date Completed:08/09/2021

08/09/2021 12:09 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Case Narrative
Tetra Tech
Lot Number: WG24009

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

The continuing calibration verification (CCV) associated with samples WG24009-008, WG24009-011 for analytes: 6:2-FTS recovered above the upper control limit. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

Sample WG24009-004 had multiple surrogates recovered outside of the acceptance limits due to matrix interference. The sample was reanalyzed at a dilution, all runs have been reported.

Sample Summary

Tetra Tech

Lot Number: WG24009

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC22-10J02A-072221	Aqueous	07/22/2021 1210	07/24/2021
002	AOPC22-10J02A-072221-FD	Aqueous	07/22/2021 1210	07/24/2021
003	AOPC5-14D28A-072221	Aqueous	07/22/2021 1220	07/24/2021
004	AOPC5-14D36A-072221	Aqueous	07/22/2021 1345	07/24/2021
005	AOPC22-10J01A-072221	Aqueous	07/22/2021 1350	07/24/2021
006	AOPC6-14D02A-072221	Aqueous	07/22/2021 1540	07/24/2021
007	AOPC1,6,7-14C60A-072221	Aqueous	07/22/2021 1550	07/24/2021
008	FB-12-072221	Aqueous	07/22/2021 1650	07/24/2021
009	AOPC17,21-EXW-4-072321	Aqueous	07/23/2021 1300	07/24/2021
010	AOPC18-A-072321	Aqueous	07/23/2021 1325	07/24/2021
011	FB-13-072321	Aqueous	07/23/2021 1500	07/24/2021

(11 samples)

Detection Summary

Tetra Tech

Lot Number: WG24009

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	AOPC22-10J02A-072221	Aqueous	6:2 FTS	PFAS by ID	79		ng/L	7
001	AOPC22-10J02A-072221	Aqueous	PFBS	PFAS by ID	7.9		ng/L	7
001	AOPC22-10J02A-072221	Aqueous	PFPeS	PFAS by ID	4.4		ng/L	7
001	AOPC22-10J02A-072221	Aqueous	PFHxS	PFAS by ID	38		ng/L	7
001	AOPC22-10J02A-072221	Aqueous	PFBA	PFAS by ID	3.5		ng/L	7
001	AOPC22-10J02A-072221	Aqueous	PFOA	PFAS by ID	1.9	J	ng/L	7
001	AOPC22-10J02A-072221	Aqueous	PFOS	PFAS by ID	15		ng/L	7
002	AOPC22-10J02A-072221-FD	Aqueous	6:2 FTS	PFAS by ID	66		ng/L	9
002	AOPC22-10J02A-072221-FD	Aqueous	PFBS	PFAS by ID	7.6		ng/L	9
002	AOPC22-10J02A-072221-FD	Aqueous	PFPeS	PFAS by ID	4.6		ng/L	9
002	AOPC22-10J02A-072221-FD	Aqueous	PFHxS	PFAS by ID	39		ng/L	9
002	AOPC22-10J02A-072221-FD	Aqueous	PFBA	PFAS by ID	3.4		ng/L	9
002	AOPC22-10J02A-072221-FD	Aqueous	PFOA	PFAS by ID	2.2	J	ng/L	9
002	AOPC22-10J02A-072221-FD	Aqueous	PFOS	PFAS by ID	22		ng/L	9
003	AOPC5-14D28A-072221	Aqueous	8:2 FTS	PFAS by ID	6.8	J	ng/L	11
003	AOPC5-14D28A-072221	Aqueous	6:2 FTS	PFAS by ID	230		ng/L	11
003	AOPC5-14D28A-072221	Aqueous	4:2 FTS	PFAS by ID	2.4	J	ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFBS	PFAS by ID	69		ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFHpS	PFAS by ID	80		ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFNS	PFAS by ID	1.4	J	ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFOSA	PFAS by ID	2.3	J	ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFPeS	PFAS by ID	72		ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFHxS	PFAS by ID	780		ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFBA	PFAS by ID	47		ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFHpA	PFAS by ID	24		ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFHxA	PFAS by ID	220		ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFNA	PFAS by ID	2.4	J	ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFOA	PFAS by ID	77		ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFPeA	PFAS by ID	70		ng/L	11
003	AOPC5-14D28A-072221	Aqueous	PFOS	PFAS by ID	5400		ng/L	11
004	AOPC5-14D36A-072221	Aqueous	8:2 FTS	PFAS by ID	28		ng/L	13
004	AOPC5-14D36A-072221	Aqueous	4:2 FTS	PFAS by ID	8.3		ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFBS	PFAS by ID	320		ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFHpS	PFAS by ID	530		ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFNS	PFAS by ID	7.9	Q	ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFOSA	PFAS by ID	4.3		ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFPeS	PFAS by ID	340		ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFBA	PFAS by ID	170		ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFDA	PFAS by ID	1.1	J	ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFHpA	PFAS by ID	89		ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFNA	PFAS by ID	3.8	Q	ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFOA	PFAS by ID	380		ng/L	13
004	AOPC5-14D36A-072221	Aqueous	PFPeA	PFAS by ID	250		ng/L	13

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
004	AOPC5-14D36A-072221	Aqueous	PFHxS	PFAS by ID	3000		ng/L	15
004	AOPC5-14D36A-072221	Aqueous	PFHxA	PFAS by ID	930		ng/L	15
004	AOPC5-14D36A-072221	Aqueous	PFOS	PFAS by ID	23000		ng/L	15
004	AOPC5-14D36A-072221	Aqueous	6:2 FTS	PFAS by ID	940		ng/L	17
005	AOPC22-10J01A-072221	Aqueous	PFBS	PFAS by ID	11		ng/L	19
005	AOPC22-10J01A-072221	Aqueous	PFPeS	PFAS by ID	4.6		ng/L	19
005	AOPC22-10J01A-072221	Aqueous	PFHxS	PFAS by ID	56		ng/L	19
005	AOPC22-10J01A-072221	Aqueous	PFBA	PFAS by ID	22		ng/L	19
005	AOPC22-10J01A-072221	Aqueous	PFOA	PFAS by ID	1.5	J	ng/L	19
005	AOPC22-10J01A-072221	Aqueous	PFOS	PFAS by ID	15		ng/L	19
006	AOPC6-14D02A-072221	Aqueous	6:2 FTS	PFAS by ID	680	J	ng/L	21
006	AOPC6-14D02A-072221	Aqueous	PFBS	PFAS by ID	620		ng/L	21
006	AOPC6-14D02A-072221	Aqueous	PFHpS	PFAS by ID	500		ng/L	21
006	AOPC6-14D02A-072221	Aqueous	PFPeS	PFAS by ID	590		ng/L	21
006	AOPC6-14D02A-072221	Aqueous	PFHxS	PFAS by ID	5200		ng/L	21
006	AOPC6-14D02A-072221	Aqueous	PFBA	PFAS by ID	350	J	ng/L	21
006	AOPC6-14D02A-072221	Aqueous	PFHpA	PFAS by ID	230	J	ng/L	21
006	AOPC6-14D02A-072221	Aqueous	PFHxA	PFAS by ID	1700		ng/L	21
006	AOPC6-14D02A-072221	Aqueous	PFOA	PFAS by ID	610		ng/L	21
006	AOPC6-14D02A-072221	Aqueous	PFPeA	PFAS by ID	510		ng/L	21
006	AOPC6-14D02A-072221	Aqueous	PFOS	PFAS by ID	15000		ng/L	21
007	AOPC1,6,7-14C60A-072221	Aqueous	6:2 FTS	PFAS by ID	35	J	ng/L	23
007	AOPC1,6,7-14C60A-072221	Aqueous	PFBS	PFAS by ID	180		ng/L	23
007	AOPC1,6,7-14C60A-072221	Aqueous	PFHpS	PFAS by ID	34	J	ng/L	23
007	AOPC1,6,7-14C60A-072221	Aqueous	PFPeS	PFAS by ID	190		ng/L	23
007	AOPC1,6,7-14C60A-072221	Aqueous	PFHxS	PFAS by ID	970		ng/L	23
007	AOPC1,6,7-14C60A-072221	Aqueous	PFBA	PFAS by ID	49		ng/L	23
007	AOPC1,6,7-14C60A-072221	Aqueous	PFHpA	PFAS by ID	44		ng/L	23
007	AOPC1,6,7-14C60A-072221	Aqueous	PFHxA	PFAS by ID	220		ng/L	23
007	AOPC1,6,7-14C60A-072221	Aqueous	PFOA	PFAS by ID	140		ng/L	23
007	AOPC1,6,7-14C60A-072221	Aqueous	PFPeA	PFAS by ID	56		ng/L	23
007	AOPC1,6,7-14C60A-072221	Aqueous	PFOS	PFAS by ID	1000		ng/L	23
008	FB-12-072221	Aqueous	PFOS	PFAS by ID	1.8	J	ng/L	25
009	AOPC17,21-EXW-4-072321	Aqueous	6:2 FTS	PFAS by ID	6.0	J	ng/L	27
009	AOPC17,21-EXW-4-072321	Aqueous	PFBS	PFAS by ID	7.7		ng/L	27
009	AOPC17,21-EXW-4-072321	Aqueous	PFPeS	PFAS by ID	5.0		ng/L	27
009	AOPC17,21-EXW-4-072321	Aqueous	PFHxS	PFAS by ID	47		ng/L	27
009	AOPC17,21-EXW-4-072321	Aqueous	PFBA	PFAS by ID	12		ng/L	27
009	AOPC17,21-EXW-4-072321	Aqueous	PFOA	PFAS by ID	24		ng/L	27
009	AOPC17,21-EXW-4-072321	Aqueous	PFOS	PFAS by ID	27		ng/L	27
010	AOPC18-A-072321	Aqueous	6:2 FTS	PFAS by ID	110		ng/L	29
010	AOPC18-A-072321	Aqueous	PFBS	PFAS by ID	22		ng/L	29
010	AOPC18-A-072321	Aqueous	PFHpS	PFAS by ID	5.2		ng/L	29
010	AOPC18-A-072321	Aqueous	PFPeS	PFAS by ID	23		ng/L	29
010	AOPC18-A-072321	Aqueous	PFHxS	PFAS by ID	220		ng/L	29
010	AOPC18-A-072321	Aqueous	PFBA	PFAS by ID	82		ng/L	29
010	AOPC18-A-072321	Aqueous	PFHpA	PFAS by ID	52		ng/L	29
010	AOPC18-A-072321	Aqueous	PFHxA	PFAS by ID	180		ng/L	29

Detection Summary (Continued)

Lot Number: WG24009

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
010	AOPC18-A-072321	Aqueous	PFNA	PFAS by ID	0.91	J	ng/L	29
010	AOPC18-A-072321	Aqueous	PFOA	PFAS by ID	25		ng/L	29
010	AOPC18-A-072321	Aqueous	PFPeA	PFAS by ID	190		ng/L	29
010	AOPC18-A-072321	Aqueous	PFOS	PFAS by ID	150		ng/L	29

(95 detections)

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-001
Description: AOPC22-10J02A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 1959	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	79		6.7	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.9		3.4	1.7	0.84	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.4		3.4	1.7	0.84	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	38		3.4	1.7	0.84	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.5		3.4	1.7	0.84	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	J	3.4	1.7	0.84	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	15		3.4	1.7	0.84	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		96	50-150
13C2_6:2FTS		96	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		64	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		79	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		76	50-150
13C7_PFUdA		79	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG24009-001
Description: AOPC22-10J02A-072221			Matrix: Aqueous
Date Sampled: 07/22/2021 1210		Project Name: NASA ARC PFAS	
Date Received: 07/24/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		74	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-002
Description: AOPC22-10J02A-072221-FD | Matrix: Aqueous
Date Sampled: 07/22/2021 1210 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2010	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	66		6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.6		3.4	1.7	0.85	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.6		3.4	1.7	0.85	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	39		3.4	1.7	0.85	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.4		3.4	1.7	0.85	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.2	J	3.4	1.7	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	22		3.4	1.7	0.85	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		103	50-150
13C2_6:2FTS		95	50-150
13C2_8:2FTS		99	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		72	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-002
Description: AOPC22-10J02A-072221-FD
Matrix: Aqueous
Date Sampled: 07/22/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-003
Description: AOPC5-14D28A-072221 | Matrix: Aqueous
Date Sampled: 07/22/2021 1220 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2021	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	20	08/04/2021 1944	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	6.8	J	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	230		7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	2.4	J	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	69		3.6	1.8	0.89	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	80		3.6	1.8	0.89	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.4	J	3.6	1.8	0.89	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.3	J	3.6	1.8	0.89	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	72		3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	780		71	36	18	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	47		3.6	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	24		3.6	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	220		3.6	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.4	J	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	77		3.6	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	70		3.6	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5400		71	36	18	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		87	50-150		113	50-150
13C2_6:2FTS		91	50-150		112	50-150
13C2_8:2FTS		80	50-150		104	50-150
13C2_PFDoA		78	50-150		90	50-150
13C2_PFTeDA		76	50-150		99	50-150
13C3_PFBS		78	50-150		101	50-150
13C3_PFHxS		76	50-150		98	50-150
13C3-HFPO-DA		80	50-150		108	50-150
13C4_PFBA		80	50-150		102	50-150
13C4_PFHpA		76	50-150		102	50-150
13C5_PFHxA		78	50-150		100	50-150
13C5_PFPeA		82	50-150		102	50-150
13C6_PFDA		77	50-150		105	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-003
Description: AOPC5-14D28A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1220
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		76	50-150		108	50-150
13C8_PFOA		87	50-150		105	50-150
13C8_PFOS		66	50-150		103	50-150
13C8_PFOSA		85	50-150		103	50-150
13C9_PFNA		66	50-150		100	50-150
d5-EtFOSAA		81	50-150		114	50-150
d3-MeFOSAA		82	50-150		103	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2031	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/04/2021 2005	JJG	07/29/2021 1048	10417
3	SOP SPE	PFAS by ID SOP QSM B-15	100	08/05/2021 2051	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	28		7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	860	E	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	8.3		7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	320		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	UQ	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	530		3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	7.9	Q	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	4.3		3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	340		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4200	E	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	170		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.1	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	89		3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	980	E	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	3.8	Q	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	380		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	250		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	33000	EQ	3.7	1.9	0.92	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		87	50-150		107	50-150		127	50-150
13C2_6:2FTS		78	50-150		122	50-150		121	50-150
13C2_8:2FTS		91	50-150		103	50-150		137	50-150
13C2_PFDoA		75	50-150		97	50-150		117	50-150
13C2_PFTeDA		75	50-150		100	50-150		113	50-150
13C3_PFBS		81	50-150		98	50-150		105	50-150
13C3_PFHxS		58	50-150		101	50-150		110	50-150
13C3-HFPO-DA		84	50-150		106	50-150		121	50-150
13C4_PFBA		79	50-150		103	50-150		114	50-150
13C4_PFHpA		70	50-150		101	50-150		115	50-150
13C5_PFHxA		72	50-150		96	50-150		114	50-150
13C5_PFPeA		80	50-150		101	50-150		120	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		81	50-150		100	50-150		114	50-150
13C7_PFUdA		75	50-150		112	50-150		113	50-150
13C8_PFOA		78	50-150		106	50-150		121	50-150
13C8_PFOS	N	42	50-150		104	50-150		120	50-150
13C8_PFOSA		91	50-150		106	50-150		132	50-150
13C9_PFNA	N	44	50-150		97	50-150		112	50-150
d5-EtFOSAA		84	50-150		113	50-150		133	50-150
d3-MeFOSAA		85	50-150		103	50-150		135	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2031	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/04/2021 2005	JJG	07/29/2021 1048	10417
3	SOP SPE	PFAS by ID SOP QSM B-15	100	08/05/2021 2051	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	370	U	730	370	180	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	370	U	730	370	180	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	690	J	730	370	180	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	370	U	730	370	180	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	370	U	730	370	180	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	370	U	730	370	180	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	300	J	370	190	92	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	420		370	190	92	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	290	J	370	190	92	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3000		370	190	92	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	150	J	370	190	92	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	930		370	190	92	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	370		370	190	92	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	230	J	370	190	92	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	23000		370	190	92	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		87	50-150		107	50-150		127	50-150
13C2_6:2FTS		78	50-150		122	50-150		121	50-150
13C2_8:2FTS		91	50-150		103	50-150		137	50-150
13C2_PFDoA		75	50-150		97	50-150		117	50-150
13C2_PFTeDA		75	50-150		100	50-150		113	50-150
13C3_PFBS		81	50-150		98	50-150		105	50-150
13C3_PFHxS		58	50-150		101	50-150		110	50-150
13C3-HFPO-DA		84	50-150		106	50-150		121	50-150
13C4_PFBA		79	50-150		103	50-150		114	50-150
13C4_PFHpA		70	50-150		101	50-150		115	50-150
13C5_PFHxA		72	50-150		96	50-150		114	50-150
13C5_PFPeA		80	50-150		101	50-150		120	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		81	50-150		100	50-150		114	50-150
13C7_PFUdA		75	50-150		112	50-150		113	50-150
13C8_PFOA		78	50-150		106	50-150		121	50-150
13C8_PFOS	N	42	50-150		104	50-150		120	50-150
13C8_PFOSA		91	50-150		106	50-150		132	50-150
13C9_PFNA	N	44	50-150		97	50-150		112	50-150
d5-EtFOSAA		84	50-150		113	50-150		133	50-150
d3-MeFOSAA		85	50-150		103	50-150		135	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2031	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/04/2021 2005	JJG	07/29/2021 1048	10417
3	SOP SPE	PFAS by ID SOP QSM B-15	100	08/05/2021 2051	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	370	U	730	370	180	ng/L	3
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	370	U	730	370	180	ng/L	3
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	370	U	730	370	180	ng/L	3
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	940		730	370	180	ng/L	3
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	370	U	730	370	180	ng/L	3
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	370	U	730	370	180	ng/L	3
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	370	U	730	370	180	ng/L	3
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	370	U	730	370	180	ng/L	3
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	370	U	730	370	180	ng/L	3
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	300	J	370	190	92	ng/L	3
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	420		370	190	92	ng/L	3
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	320	J	370	190	92	ng/L	3
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3300		370	190	92	ng/L	3
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	170	J	370	190	92	ng/L	3
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	950		370	190	92	ng/L	3
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	360	J	370	190	92	ng/L	3
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	240	J	370	190	92	ng/L	3
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	23000		370	190	92	ng/L	3

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		87	50-150		107	50-150		127	50-150
13C2_6:2FTS		78	50-150		122	50-150		121	50-150
13C2_8:2FTS		91	50-150		103	50-150		137	50-150
13C2_PFDoA		75	50-150		97	50-150		117	50-150
13C2_PFTeDA		75	50-150		100	50-150		113	50-150
13C3_PFBS		81	50-150		98	50-150		105	50-150
13C3_PFHxS		58	50-150		101	50-150		110	50-150
13C3-HFPO-DA		84	50-150		106	50-150		121	50-150
13C4_PFBA		79	50-150		103	50-150		114	50-150
13C4_PFHpA		70	50-150		101	50-150		115	50-150
13C5_PFHxA		72	50-150		96	50-150		114	50-150
13C5_PFPeA		80	50-150		101	50-150		120	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		81	50-150		100	50-150		114	50-150
13C7_PFUdA		75	50-150		112	50-150		113	50-150
13C8_PFOA		78	50-150		106	50-150		121	50-150
13C8_PFOS	N	42	50-150		104	50-150		120	50-150
13C8_PFOSA		91	50-150		106	50-150		132	50-150
13C9_PFNA	N	44	50-150		97	50-150		112	50-150
d5-EtFOSAA		84	50-150		113	50-150		133	50-150
d3-MeFOSAA		85	50-150		103	50-150		135	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-005
Description: AOPC22-10J01A-072221 | Matrix: Aqueous
Date Sampled: 07/22/2021 1350 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2042	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	11		3.7	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.6		3.7	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	56		3.7	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	22		3.7	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.5	J	3.7	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	15		3.7	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		88	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		78	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		71	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		77	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		74	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		72	50-150
13C7_PFUdA		77	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG24009-005
Description: AOPC22-10J01A-072221			Matrix: Aqueous
Date Sampled: 07/22/2021 1350		Project Name: NASA ARC PFAS	
Date Received: 07/24/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-006
Description: AOPC6-14D02A-072221 | Matrix: Aqueous
Date Sampled: 07/22/2021 1540 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/04/2021 2016	JJG	07/29/2021 1048	10417
3	SOP SPE	PFAS by ID SOP QSM B-15	100	08/05/2021 2102	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	370	U	730	370	180	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	370	U	730	370	180	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	680	J	730	370	180	ng/L	3
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	370	U	730	370	180	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	370	U	730	370	180	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	370	U	730	370	180	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	620		360	180	91	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	500		360	180	91	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	590		360	180	91	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5200		360	180	91	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	350	J	360	180	91	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	230	J	360	180	91	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1700		360	180	91	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	610		360	180	91	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	510		360	180	91	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	15000		360	180	91	ng/L	2

Surrogate	Q	Run 2 % Recovery	Run 2 Acceptance Limits	Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		97	50-150		109	50-150
13C2_6:2FTS		105	50-150		112	50-150
13C2_8:2FTS		96	50-150		113	50-150
13C2_PFDoA		92	50-150		109	50-150
13C2_PFTeDA		93	50-150		107	50-150
13C3_PFBS		92	50-150		105	50-150
13C3_PFHxS		92	50-150		108	50-150
13C3-HFPO-DA		98	50-150		112	50-150
13C4_PFBA		94	50-150		106	50-150
13C4_PFHpA		94	50-150		115	50-150
13C5_PFHxA		88	50-150		115	50-150
13C5_PFPeA		94	50-150		106	50-150
13C6_PFDA		94	50-150		120	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-006
Description: AOPC6-14D02A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1540
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C7_PFUdA		111	50-150		105	50-150
13C8_PFOA		96	50-150		105	50-150
13C8_PFOS		96	50-150		112	50-150
13C8_PFOSA		98	50-150		127	50-150
13C9_PFNA		88	50-150		112	50-150
d5-EtFOSAA		102	50-150		118	50-150
d3-MeFOSAA		100	50-150		124	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-007
Description: AOPC1,6,7-14C60A-072221 | Matrix: Aqueous
Date Sampled: 07/22/2021 1550 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	10	08/04/2021 1933	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	5	08/05/2021 1958	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	36	U	72	36	18	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	36	U	72	36	18	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	36	U	72	36	18	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	35	J	36	18	9.1	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	36	U	72	36	18	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	36	U	72	36	18	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	36	U	72	36	18	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	36	U	72	36	18	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	36	U	72	36	18	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	180		36	18	9.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	34	J	36	18	9.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	190		36	18	9.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	970		36	18	9.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	49		36	18	9.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	44		36	18	9.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	220		36	18	9.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	140		36	18	9.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	56		36	18	9.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1000		36	18	9.1	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		113	50-150		101	50-150
13C2_6:2FTS		103	50-150		102	50-150
13C2_8:2FTS		93	50-150		118	50-150
13C2_PFDoA		97	50-150		105	50-150
13C2_PFTeDA		101	50-150		100	50-150
13C3_PFBS		103	50-150		100	50-150
13C3_PFHxS		93	50-150		99	50-150
13C3-HFPO-DA		109	50-150		104	50-150
13C4_PFBA		101	50-150		101	50-150
13C4_PFHpA		96	50-150		107	50-150
13C5_PFHxA		102	50-150		99	50-150
13C5_PFPeA		106	50-150		106	50-150
13C6_PFDA		102	50-150		109	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-007
Description: AOPC1,6,7-14C60A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1550
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		106	50-150		95	50-150
13C8_PFOA		102	50-150		99	50-150
13C8_PFOS		103	50-150		105	50-150
13C8_PFOSA		111	50-150		106	50-150
13C9_PFNA		99	50-150		102	50-150
d5-EtFOSAA		106	50-150		105	50-150
d3-MeFOSAA		105	50-150		113	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-008
Description: FB-12-072221 | Matrix: Aqueous
Date Sampled: 07/22/2021 1650 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1747	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	J	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		92	50-150
13C2_6:2FTS		106	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		80	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		89	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG24009-008
Description: FB-12-072221			Matrix: Aqueous
Date Sampled: 07/22/2021 1650		Project Name: NASA ARC PFAS	
Date Received: 07/24/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-009
Description: AOPC17,21-EXW-4-072321 | Matrix: Aqueous
Date Sampled: 07/23/2021 1300 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1757	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/05/2021 1926	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.0	J	7.8	3.9	2.0	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.7		3.9	2.0	0.98	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.0		3.9	2.0	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	47		3.9	2.0	0.98	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.9	2.0	0.98	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	24		3.9	2.0	0.98	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	27		3.9	2.0	0.98	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		91	50-150		105	50-150
13C2_6:2FTS		112	50-150		143	50-150
13C2_8:2FTS		86	50-150		91	50-150
13C2_PFDoA		76	50-150		99	50-150
13C2_PFTeDA		72	50-150		87	50-150
13C3_PFBS		78	50-150		83	50-150
13C3_PFHxS		76	50-150		88	50-150
13C3-HFPO-DA		89	50-150		93	50-150
13C4_PFBA		84	50-150		93	50-150
13C4_PFHpA		82	50-150		91	50-150
13C5_PFHxA		83	50-150		93	50-150
13C5_PFPeA		82	50-150		94	50-150
13C6_PFDA		76	50-150		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-009
Description: AOPC17,21-EXW-4-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 1300
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		84	50-150		84	50-150
13C8_PFOA		100	50-150		105	50-150
13C8_PFOS		79	50-150		91	50-150
13C8_PFOSA		83	50-150		103	50-150
13C9_PFNA		81	50-150		98	50-150
d5-EtFOSAA		85	50-150		98	50-150
d3-MeFOSAA		79	50-150		108	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-010
Description: AOPC18-A-072321 | Matrix: Aqueous
Date Sampled: 07/23/2021 1325 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1808	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/05/2021 1937	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	110		7.2	3.6	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	22		3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	5.2		3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	23		3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	220		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	82		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	52		3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	180		3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.91	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	25		3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190		3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	150		3.6	1.8	0.90	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		90	50-150		110	50-150
13C2_6:2FTS		95	50-150		106	50-150
13C2_8:2FTS		82	50-150		92	50-150
13C2_PFDoA		68	50-150		87	50-150
13C2_PFTeDA		68	50-150		74	50-150
13C3_PFBS		75	50-150		77	50-150
13C3_PFHxS		76	50-150		85	50-150
13C3-HFPO-DA		87	50-150		96	50-150
13C4_PFBA		80	50-150		86	50-150
13C4_PFHpA		80	50-150		98	50-150
13C5_PFHxA		80	50-150		94	50-150
13C5_PFPeA		82	50-150		90	50-150
13C6_PFDA		72	50-150		92	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-010
Description: AOPC18-A-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 1325
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		72	50-150		80	50-150
13C8_PFOA		85	50-150		90	50-150
13C8_PFOS		76	50-150		83	50-150
13C8_PFOSA		75	50-150		90	50-150
13C9_PFNA		75	50-150		87	50-150
d5-EtFOSAA		79	50-150		95	50-150
d3-MeFOSAA		73	50-150		98	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-011
Description: FB-13-072321 | Matrix: Aqueous
Date Sampled: 07/23/2021 1500 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1851	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		90	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		73	50-150
13C2_PFDoA		65	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		77	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG24009-011
Description: FB-13-072321			Matrix: Aqueous
Date Sampled: 07/23/2021 1500		Project Name: NASA ARC PFAS	
Date Received: 07/24/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	50-150
13C8_PFOS		75	50-150
13C8_PFOSA		74	50-150
13C9_PFNA		76	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		75	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ10417-001
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	50-150
13C2_6:2FTS		87	50-150
13C2_8:2FTS		75	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10417-001
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		73	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		80	50-150
13C8_PFOS		74	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10417-002
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	99	70-150	07/31/2021 1906
11Cl-PF3OUdS	15	14		1	94	70-150	07/31/2021 1906
8:2 FTS	15	12		1	78	67-138	07/31/2021 1906
6:2 FTS	15	13		1	88	64-140	07/31/2021 1906
4:2 FTS	15	14		1	92	63-143	07/31/2021 1906
GenX	32	33		1	102	70-150	07/31/2021 1906
ADONA	15	16		1	107	70-150	07/31/2021 1906
EtFOSAA	16	17		1	104	61-135	07/31/2021 1906
MeFOSAA	16	16		1	102	65-136	07/31/2021 1906
PFBS	14	16		1	113	72-130	07/31/2021 1906
PFDS	15	14		1	92	53-142	07/31/2021 1906
PFHpS	15	16		1	102	69-134	07/31/2021 1906
PFNS	15	15		1	99	69-127	07/31/2021 1906
PFOSA	16	15		1	96	67-137	07/31/2021 1906
PFPeS	15	15		1	103	71-127	07/31/2021 1906
PFHxS	15	15		1	104	68-131	07/31/2021 1906
PFBA	16	17		1	107	73-129	07/31/2021 1906
PFDA	16	17		1	103	71-129	07/31/2021 1906
PFDoA	16	18		1	115	72-134	07/31/2021 1906
PFHpA	16	17		1	107	72-130	07/31/2021 1906
PFHxA	16	17		1	108	72-129	07/31/2021 1906
PFNA	16	18		1	111	69-130	07/31/2021 1906
PFOA	16	18		1	113	71-133	07/31/2021 1906
PFPeA	16	18		1	114	72-129	07/31/2021 1906
PFTeDA	16	17		1	105	71-132	07/31/2021 1906
PFTrDA	16	19		1	120	65-144	07/31/2021 1906
PFUdA	16	18		1	113	69-133	07/31/2021 1906
PFOS	15	14		1	96	65-140	07/31/2021 1906

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	50-150
13C2_6:2FTS		85	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		76	50-150
13C5_PFPeA		77	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10417-002
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	50-150
13C7_PFUdA		74	50-150
13C8_PFOA		84	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122958

Client	Tetra Tech
Address	1999 Harrison St.
City	Oakland
State	CA
Zip Code	94612
Project Name	NASA ARC PFAS
Project No.	103IG667601
P.O. No.	
Report to Contact	Mike Dahlquist
Sampler's Signature	x [signature]
Printed Name	Callie Neaves Ryan Melendez
Telephone No. / E-mail	(510) 302-6310 / mike.dahlquist@tetratech.com
Analysis (Attach list if more space is needed)	
Quote No.	
Page	1 of 2

WG24009

KE82

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Comp	Matrix: Aqueous	Matrix: Soil	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	8036 Kit	Field Filtered	PFAS (DSMB-15)	Remarks / Cooler I.D.
AOPC22-10J02A-072221	7/22/21	1210	G	x			2							X	
AOPC22-10J02A-072221-FD	7/22/21	1210	G	x			2							X	
AOPC5-14D28A-072221	7/22/21	1220	G	x			2							X	
AOPC5-14D36A-072221	7/22/21	1345	G	x			2							X	
AOPC22-10J01A-072221	7/22/21	1350	G	x			2							X	
AOPC6-14D02A-072221	7/22/21	1540	G	x			2							X	
AOPC1,6,7-14C60A-072221	7/22/21	1550	G	x			2							X	
FB-12-072221	7/22/21	1650	G	x			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TT [signature]	7/23/21	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/24/21	940	4. Laboratory received by: [signature]	7/24/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on Ice (Circle) Yes No Ice Pack Receipt Temp. 5.8 °C Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122468

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature] RcMel	Analysis (Attach list if more space is needed)	Page 2 of 2
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves Ryan Melendez		WG24009
Project Name: NASA ARC PFAS			KE82
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	NaOH/Zn	Field Filtered	PFAS (QSMB-8)	Remarks / Cooler I.D.
AOPC17,21-EXW-4-072321	7/23/21	1300	G	X			2							X	
AOPC18-A-072321	7/23/21	1325	G	X			2							X	
FB-13-072321	7/23/21	1500	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	7/23/21	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fred E Y	7/24/21	940	4. Laboratory received by: [signature]	7/24/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on ice (Circle) Yes No Ice Pack Receipt Temp. 5.8 °C Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: TETRA TECH | Cooler Inspected by/date: JSM / 07/24/2021 | Lot #: WG24069

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: ____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA | Chlorine Strip ID: NA | Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt | %Solid Snap-Cup ID: NA

5.8 / 5.8 °C | NA / NA °C | NA / NA °C | NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote # NA

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JSM Date: 07/24/2021

Comments:

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dahlguist

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Lot Number:**WG31010**

Date Completed:08/22/2021

08/24/2021 10:17 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Tetra Tech
Lot Number: WG31010

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Samples WG31010-005 (parent, MS, and MSD) required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

The method blank associated with batch 11942 had 6:2 FTS detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for 6:2 FTS have been flagged with a "B".

Sample WG31010-002 had the surrogate 4:2FTS recovered above the acceptance limits. This reflects a high bias for compounds associated with this surrogate. There were no detections for these compounds in the sample; therefore, there is no impact on data quality and no corrective action is required.

Sample Summary

Tetra Tech

Lot Number: WG31010

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC2,26-PFAS-C-072921	Aqueous	07/29/2021 1100	07/31/2021
002	AOPC1-WU4-25-072921	Aqueous	07/29/2021 1220	07/31/2021
003	ERB-02-072921	Aqueous	07/29/2021 1630	07/31/2021
004	ERB-03-072921	Aqueous	07/29/2021 1645	07/31/2021
005	AOPC2-PFAS-E-072921	Aqueous	07/29/2021 1445	07/31/2021
006	AOPC2-PFAS-F-072921	Aqueous	07/29/2021 1525	07/31/2021
007	AOPC2-PFAS-F-072921-FD	Aqueous	07/29/2021 1525	07/31/2021
008	FB-16-072921	Aqueous	07/29/2021 1700	07/31/2021

(8 samples)

Detection Summary

Tetra Tech

Lot Number: WG31010

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	AOPC2,26-PFAS-C-072921	Aqueous	6:2 FTS	PFAS by ID	13	B	ng/L	6
001	AOPC2,26-PFAS-C-072921	Aqueous	PFBS	PFAS by ID	9.0		ng/L	6
001	AOPC2,26-PFAS-C-072921	Aqueous	PFHpS	PFAS by ID	0.89	J	ng/L	6
001	AOPC2,26-PFAS-C-072921	Aqueous	PFPeS	PFAS by ID	2.6	J	ng/L	6
001	AOPC2,26-PFAS-C-072921	Aqueous	PFHxS	PFAS by ID	23		ng/L	6
001	AOPC2,26-PFAS-C-072921	Aqueous	PFBA	PFAS by ID	7.2		ng/L	6
001	AOPC2,26-PFAS-C-072921	Aqueous	PFHxA	PFAS by ID	1.3	J	ng/L	6
001	AOPC2,26-PFAS-C-072921	Aqueous	PFOA	PFAS by ID	4.6		ng/L	6
001	AOPC2,26-PFAS-C-072921	Aqueous	PFPeA	PFAS by ID	1.1	J	ng/L	6
001	AOPC2,26-PFAS-C-072921	Aqueous	PFOS	PFAS by ID	35		ng/L	6
002	AOPC1-WU4-25-072921	Aqueous	6:2 FTS	PFAS by ID	17	B	ng/L	8
002	AOPC1-WU4-25-072921	Aqueous	PFBS	PFAS by ID	7.0		ng/L	8
002	AOPC1-WU4-25-072921	Aqueous	PFHpS	PFAS by ID	1.2	J	ng/L	8
002	AOPC1-WU4-25-072921	Aqueous	PFPeS	PFAS by ID	6.1		ng/L	8
002	AOPC1-WU4-25-072921	Aqueous	PFHxS	PFAS by ID	55		ng/L	8
002	AOPC1-WU4-25-072921	Aqueous	PFBA	PFAS by ID	5.2		ng/L	8
002	AOPC1-WU4-25-072921	Aqueous	PFHpA	PFAS by ID	5.8		ng/L	8
002	AOPC1-WU4-25-072921	Aqueous	PFHxA	PFAS by ID	13		ng/L	8
002	AOPC1-WU4-25-072921	Aqueous	PFOA	PFAS by ID	27		ng/L	8
002	AOPC1-WU4-25-072921	Aqueous	PFPeA	PFAS by ID	12		ng/L	8
002	AOPC1-WU4-25-072921	Aqueous	PFOS	PFAS by ID	13		ng/L	8
003	ERB-02-072921	Aqueous	9Cl-PF3ONS	PFAS by ID	3.4	J	ng/L	10
003	ERB-02-072921	Aqueous	11Cl-PF3OUdS	PFAS by ID	2.5	J	ng/L	10
003	ERB-02-072921	Aqueous	8:2 FTS	PFAS by ID	3.7	J	ng/L	10
003	ERB-02-072921	Aqueous	6:2 FTS	PFAS by ID	770		ng/L	10
003	ERB-02-072921	Aqueous	4:2 FTS	PFAS by ID	4.8	J	ng/L	10
003	ERB-02-072921	Aqueous	GenX	PFAS by ID	8.3		ng/L	10
003	ERB-02-072921	Aqueous	ADONA	PFAS by ID	3.7	J	ng/L	10
003	ERB-02-072921	Aqueous	EtFOSAA	PFAS by ID	3.1	J	ng/L	10
003	ERB-02-072921	Aqueous	MeFOSAA	PFAS by ID	3.8	J	ng/L	10
003	ERB-02-072921	Aqueous	PFBS	PFAS by ID	5.5		ng/L	10
003	ERB-02-072921	Aqueous	PFDS	PFAS by ID	2.1	J	ng/L	10
003	ERB-02-072921	Aqueous	PFHpS	PFAS by ID	6.6		ng/L	10
003	ERB-02-072921	Aqueous	PFNS	PFAS by ID	3.3	J	ng/L	10
003	ERB-02-072921	Aqueous	PFOSA	PFAS by ID	4.1		ng/L	10
003	ERB-02-072921	Aqueous	PFPeS	PFAS by ID	6.2		ng/L	10
003	ERB-02-072921	Aqueous	PFHxS	PFAS by ID	35		ng/L	10
003	ERB-02-072921	Aqueous	PFBA	PFAS by ID	43		ng/L	10
003	ERB-02-072921	Aqueous	PFDA	PFAS by ID	4.0		ng/L	10
003	ERB-02-072921	Aqueous	PFDoA	PFAS by ID	3.3	J	ng/L	10
003	ERB-02-072921	Aqueous	PFHpA	PFAS by ID	24		ng/L	10
003	ERB-02-072921	Aqueous	PFHxA	PFAS by ID	89		ng/L	10
003	ERB-02-072921	Aqueous	PFNA	PFAS by ID	4.4		ng/L	10

Detection Summary (Continued)

Lot Number: WG31010

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
003	ERB-02-072921	Aqueous	PFOA	PFAS by ID	75		ng/L	10
003	ERB-02-072921	Aqueous	PFPeA	PFAS by ID	190		ng/L	10
003	ERB-02-072921	Aqueous	PFTeDA	PFAS by ID	1.6	J	ng/L	10
003	ERB-02-072921	Aqueous	PFTrDA	PFAS by ID	2.1	J	ng/L	10
003	ERB-02-072921	Aqueous	PFUdA	PFAS by ID	4.0		ng/L	10
003	ERB-02-072921	Aqueous	PFOS	PFAS by ID	280		ng/L	10
005	AOPC2-PFAS-E-072921	Aqueous	PFBS	PFAS by ID	8.7		ng/L	14
005	AOPC2-PFAS-E-072921	Aqueous	PFPeS	PFAS by ID	3.2	J	ng/L	14
005	AOPC2-PFAS-E-072921	Aqueous	PFHxS	PFAS by ID	15		ng/L	14
005	AOPC2-PFAS-E-072921	Aqueous	PFBA	PFAS by ID	9.4		ng/L	14
005	AOPC2-PFAS-E-072921	Aqueous	PFHxA	PFAS by ID	2.7	J	ng/L	14
005	AOPC2-PFAS-E-072921	Aqueous	PFOA	PFAS by ID	4.4		ng/L	14
005	AOPC2-PFAS-E-072921	Aqueous	PFPeA	PFAS by ID	1.1	J	ng/L	14
005	AOPC2-PFAS-E-072921	Aqueous	PFOS	PFAS by ID	4.0		ng/L	14
006	AOPC2-PFAS-F-072921	Aqueous	6:2 FTS	PFAS by ID	4.5	J	ng/L	16
006	AOPC2-PFAS-F-072921	Aqueous	PFBS	PFAS by ID	6.4		ng/L	16
006	AOPC2-PFAS-F-072921	Aqueous	PFPeS	PFAS by ID	2.4	J	ng/L	16
006	AOPC2-PFAS-F-072921	Aqueous	PFHxS	PFAS by ID	18		ng/L	16
006	AOPC2-PFAS-F-072921	Aqueous	PFBA	PFAS by ID	2.5	J	ng/L	16
006	AOPC2-PFAS-F-072921	Aqueous	PFNA	PFAS by ID	1.3	J	ng/L	16
006	AOPC2-PFAS-F-072921	Aqueous	PFOA	PFAS by ID	1.8	J	ng/L	16
006	AOPC2-PFAS-F-072921	Aqueous	PFOS	PFAS by ID	11		ng/L	16
007	AOPC2-PFAS-F-072921-FD	Aqueous	6:2 FTS	PFAS by ID	4.5	J	ng/L	18
007	AOPC2-PFAS-F-072921-FD	Aqueous	PFBS	PFAS by ID	8.7		ng/L	18
007	AOPC2-PFAS-F-072921-FD	Aqueous	PFPeS	PFAS by ID	2.9	J	ng/L	18
007	AOPC2-PFAS-F-072921-FD	Aqueous	PFHxS	PFAS by ID	23		ng/L	18
007	AOPC2-PFAS-F-072921-FD	Aqueous	PFBA	PFAS by ID	3.2	J	ng/L	18
007	AOPC2-PFAS-F-072921-FD	Aqueous	PFNA	PFAS by ID	1.9	J	ng/L	18
007	AOPC2-PFAS-F-072921-FD	Aqueous	PFOA	PFAS by ID	1.7	J	ng/L	18
007	AOPC2-PFAS-F-072921-FD	Aqueous	PFOS	PFAS by ID	15		ng/L	18

(73 detections)

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31010-001
Description: AOPC2,26-PFAS-C-072921 | Matrix: Aqueous
Date Sampled: 07/29/2021 1100 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 1934	JJG	08/12/2021 1336	11942

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	13	B	6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.0		3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.89	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.6	J	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	23		3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	7.2		3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.3	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.6		3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	35		3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		131	50-150
13C2_6:2FTS		121	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		86	50-150
13C7_PFUdA		79	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-001
Description: AOPC2,26-PFAS-C-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1100
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31010-002
Description: AOPC1-WU4-25-072921 | Matrix: Aqueous
Date Sampled: 07/29/2021 1220 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 1945	JJG	08/12/2021 1336	11942

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	17	B	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	UQ	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.0		3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.2	J	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	6.1		3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	55		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	5.2		3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	5.8		3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	13		3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	27		3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	12		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	13		3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	173	50-150
13C2_6:2FTS		114	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		104	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		96	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-002
Description: AOPC1-WU4-25-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1220		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	50-150
13C8_PFOS		96	50-150
13C8_PFOSA		96	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31010-003
Description: ERB-02-072921 | Matrix: Aqueous
Date Sampled: 07/29/2021 1630 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2235	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	J	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	PFAS by ID SOP	2.5	J	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	J	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	770		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.8	J	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	8.3		7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	J	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.1	J	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	J	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.5		3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	J	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	6.6		3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.3	J	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	4.1		3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	6.2		3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	35		3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	43		3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	4.0		3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	3.3	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	24		3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	89		3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	4.4		3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	75		3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190		3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.6	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	4.0		3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	280		3.8	1.9	0.96	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		110	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		69	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		109	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		89	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-003
Description: ERB-02-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1630		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	50-150
13C8_PFOS		100	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		102	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31010-004
Description: ERB-03-072921 | Matrix: Aqueous
Date Sampled: 07/29/2021 1645 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2246	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		118	50-150
13C2_6:2FTS		129	50-150
13C2_8:2FTS		113	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		98	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		113	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		108	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		101	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-004
Description: ERB-03-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1645		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		111	50-150
13C8_PFOS		106	50-150
13C8_PFOSA		97	50-150
13C9_PFNA		106	50-150
d5-EtFOSAA		110	50-150
d3-MeFOSAA		109	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31010-005
Description: AOPC2-PFAS-E-072921 | Matrix: Aqueous
Date Sampled: 07/29/2021 1445 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/21/2021 0439	JJG	08/18/2021 1159	12470

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.7		3.8	1.9	0.95	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.2	J	3.8	1.9	0.95	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	15		3.8	1.9	0.95	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.4		3.8	1.9	0.95	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.7	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.4		3.8	1.9	0.95	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.0		3.8	1.9	0.95	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		110	50-150
13C2_6:2FTS		114	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		56	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-005
Description: AOPC2-PFAS-E-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1445		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		98	50-150
13C8_PFOS		73	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31010-006
Description: AOPC2-PFAS-F-072921 | Matrix: Aqueous
Date Sampled: 07/29/2021 1525 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2257	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.5	J	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.4		3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.4	J	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	18		3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.5	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.3	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	11		3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		147	50-150
13C2_6:2FTS		140	50-150
13C2_8:2FTS		146	50-150
13C2_PFDoA		117	50-150
13C2_PFTeDA		113	50-150
13C3_PFBS		126	50-150
13C3_PFHxS		133	50-150
13C3-HFPO-DA		135	50-150
13C4_PFBA		128	50-150
13C4_PFHpA		136	50-150
13C5_PFHxA		121	50-150
13C5_PFPeA		130	50-150
13C6_PFDA		113	50-150
13C7_PFUdA		121	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-006
Description: AOPC2-PFAS-F-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1525		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		122	50-150
13C8_PFOS		118	50-150
13C8_PFOSA		127	50-150
13C9_PFNA		129	50-150
d5-EtFOSAA		121	50-150
d3-MeFOSAA		127	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31010-007
Description: AOPC2-PFAS-F-072921-FD | Matrix: Aqueous
Date Sampled: 07/29/2021 1525 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2307	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.5	J	7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.7		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.9	J	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	23		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	15		3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		116	50-150
13C2_6:2FTS		108	50-150
13C2_8:2FTS		120	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		90	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		107	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		107	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		95	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-007
Description: AOPC2-PFAS-F-072921-FD
Matrix: Aqueous
Date Sampled: 07/29/2021 1525
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-008
Description: FB-16-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1700
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2318	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		113	50-150
13C2_6:2FTS		108	50-150
13C2_8:2FTS		120	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		106	50-150
13C3-HFPO-DA		110	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		95	50-150
13C7_PFUdA		97	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-008
Description: FB-16-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1700		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ11942-001
Batch: 11942
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1336

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
6:2 FTS	3.4	J	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	50-150
13C2_6:2FTS		98	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		89	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ11942-001
Batch: 11942
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1336

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		89	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ11942-002
Batch: 11942
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1336

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	97	70-150	08/13/2021 2218
11Cl-PF3OUdS	15	15		1	99	70-150	08/13/2021 2218
8:2 FTS	15	15		1	99	67-138	08/13/2021 2218
6:2 FTS	15	21		1	136	64-140	08/13/2021 2218
4:2 FTS	15	15		1	102	63-143	08/13/2021 2218
GenX	32	34		1	106	70-150	08/13/2021 2218
ADONA	15	17		1	112	70-150	08/13/2021 2218
EtFOSAA	16	15		1	95	61-135	08/13/2021 2218
MeFOSAA	16	15		1	95	65-136	08/13/2021 2218
PFBS	14	14		1	101	72-130	08/13/2021 2218
PFDS	15	17		1	110	53-142	08/13/2021 2218
PFHpS	15	17		1	113	69-134	08/13/2021 2218
PFNS	15	16		1	106	69-127	08/13/2021 2218
PFOSA	16	17		1	106	67-137	08/13/2021 2218
PFPeS	15	15		1	103	71-127	08/13/2021 2218
PFHxS	15	16		1	107	68-131	08/13/2021 2218
PFBA	16	17		1	108	73-129	08/13/2021 2218
PFDA	16	17		1	105	71-129	08/13/2021 2218
PFDoA	16	19		1	118	72-134	08/13/2021 2218
PFHpA	16	16		1	99	72-130	08/13/2021 2218
PFHxA	16	17		1	107	72-129	08/13/2021 2218
PFNA	16	16		1	100	69-130	08/13/2021 2218
PFOA	16	17		1	107	71-133	08/13/2021 2218
PFPeA	16	17		1	107	72-129	08/13/2021 2218
PFTeDA	16	18		1	113	71-132	08/13/2021 2218
PFTrDA	16	18		1	114	65-144	08/13/2021 2218
PFUdA	16	16		1	103	69-133	08/13/2021 2218
PFOS	15	18		1	120	65-140	08/13/2021 2218

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		96	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ11942-002
Batch: 11942
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1336

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		81	50-150
13C7_PFUdA		82	50-150
13C8_PFOA		91	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12002-001
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12002-001
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		96	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12002-002
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	100	70-150	08/14/2021 2153
11Cl-PF3OUdS	15	13		1	88	70-150	08/14/2021 2153
8:2 FTS	15	16		1	107	67-138	08/14/2021 2153
6:2 FTS	15	17		1	114	64-140	08/14/2021 2153
4:2 FTS	15	17		1	117	63-143	08/14/2021 2153
GenX	32	33		1	104	70-150	08/14/2021 2153
ADONA	15	17		1	112	70-150	08/14/2021 2153
EtFOSAA	16	15		1	97	61-135	08/14/2021 2153
MeFOSAA	16	18		1	114	65-136	08/14/2021 2153
PFBS	14	15		1	105	72-130	08/14/2021 2153
PFDS	15	12		1	75	53-142	08/14/2021 2153
PFHpS	15	17		1	110	69-134	08/14/2021 2153
PFNS	15	16		1	102	69-127	08/14/2021 2153
PFOSA	16	16		1	102	67-137	08/14/2021 2153
PFPeS	15	15		1	100	71-127	08/14/2021 2153
PFHxS	15	15		1	100	68-131	08/14/2021 2153
PFBA	16	17		1	109	73-129	08/14/2021 2153
PFDA	16	17		1	104	71-129	08/14/2021 2153
PFDoA	16	19		1	118	72-134	08/14/2021 2153
PFHpA	16	17		1	106	72-130	08/14/2021 2153
PFHxA	16	16		1	103	72-129	08/14/2021 2153
PFNA	16	17		1	104	69-130	08/14/2021 2153
PFOA	16	17		1	108	71-133	08/14/2021 2153
PFPeA	16	17		1	105	72-129	08/14/2021 2153
PFTeDA	16	18		1	112	71-132	08/14/2021 2153
PFTrDA	16	17		1	108	65-144	08/14/2021 2153
PFUdA	16	19		1	119	69-133	08/14/2021 2153
PFOS	15	15		1	99	65-140	08/14/2021 2153

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		58	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12002-002
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		90	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12470-001
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		86	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12470-001
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		86	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12470-002
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	104	70-150	08/20/2021 2050
11Cl-PF3OUdS	15	14		1	91	70-150	08/20/2021 2050
8:2 FTS	15	17		1	110	67-138	08/20/2021 2050
6:2 FTS	15	15		1	97	64-140	08/20/2021 2050
4:2 FTS	15	13		1	89	63-143	08/20/2021 2050
GenX	32	30		1	94	70-150	08/20/2021 2050
ADONA	15	18		1	117	70-150	08/20/2021 2050
EtFOSAA	16	14		1	90	61-135	08/20/2021 2050
MeFOSAA	16	15		1	92	65-136	08/20/2021 2050
PFBS	14	14		1	97	72-130	08/20/2021 2050
PFDS	15	16		1	104	53-142	08/20/2021 2050
PFHpS	15	16		1	103	69-134	08/20/2021 2050
PFNS	15	16		1	104	69-127	08/20/2021 2050
PFOSA	16	17		1	107	67-137	08/20/2021 2050
PFPeS	15	15		1	103	71-127	08/20/2021 2050
PFHxS	15	15		1	101	68-131	08/20/2021 2050
PFBA	16	16		1	99	73-129	08/20/2021 2050
PFDA	16	18		1	110	71-129	08/20/2021 2050
PFDoA	16	18		1	111	72-134	08/20/2021 2050
PFHpA	16	17		1	108	72-130	08/20/2021 2050
PFHxA	16	17		1	105	72-129	08/20/2021 2050
PFNA	16	17		1	105	69-130	08/20/2021 2050
PFOA	16	17		1	105	71-133	08/20/2021 2050
PFPeA	16	16		1	102	72-129	08/20/2021 2050
PFTeDA	16	16		1	102	71-132	08/20/2021 2050
PFTrDA	16	16		1	99	65-144	08/20/2021 2050
PFUdA	16	17		1	109	69-133	08/20/2021 2050
PFOS	15	15		1	102	65-140	08/20/2021 2050

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12470-002
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		92	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG31010-005MS
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	13		1	89	70-150	08/21/2021 0450
11Cl-PF3OUdS	ND	14	12		1	81	70-150	08/21/2021 0450
8:2 FTS	ND	15	13		1	92	67-138	08/21/2021 0450
6:2 FTS	ND	14	17		1	115	64-140	08/21/2021 0450
4:2 FTS	ND	14	12		1	87	63-143	08/21/2021 0450
GenX	ND	30	28		1	91	70-150	08/21/2021 0450
ADONA	ND	14	15		1	103	70-150	08/21/2021 0450
EtFOSAA	ND	15	13		1	89	61-135	08/21/2021 0450
MeFOSAA	ND	15	14		1	95	65-136	08/21/2021 0450
PFBS	8.7	13	21		1	92	72-130	08/21/2021 0450
PFDS	ND	15	14		1	92	53-142	08/21/2021 0450
PFHpS	ND	14	14		1	95	69-134	08/21/2021 0450
PFNS	ND	15	14		1	98	69-127	08/21/2021 0450
PFOSA	ND	15	14		1	90	67-137	08/21/2021 0450
PFPeS	3.2	14	16		1	92	71-127	08/21/2021 0450
PFHxS	15	14	30		1	106	68-131	08/21/2021 0450
PFBA	9.4	15	24		1	97	73-129	08/21/2021 0450
PFDA	ND	15	16		1	103	71-129	08/21/2021 0450
PFDoA	ND	15	15		1	100	72-134	08/21/2021 0450
PFHpA	ND	15	15		1	99	72-130	08/21/2021 0450
PFHxA	2.7	15	17		1	95	72-129	08/21/2021 0450
PFNA	ND	15	17		1	109	69-130	08/21/2021 0450
PFOA	4.4	15	20		1	105	71-133	08/21/2021 0450
PFPeA	1.1	15	16		1	95	72-129	08/21/2021 0450
PFTeDA	ND	15	15		1	101	71-132	08/21/2021 0450
PFTrDA	ND	15	15		1	97	65-144	08/21/2021 0450
PFUdA	ND	15	18		1	117	69-133	08/21/2021 0450
PFOS	4.0	14	18		1	101	65-140	08/21/2021 0450

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		128	50-150
13C2_6:2FTS		135	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		71	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		105	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG31010-005MS
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		100	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG31010-005MD
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	14	13		1	91	2.7	70-150	30	08/21/2021 0501
11Cl-PF3OUdS	ND	14	12		1	82	1.9	70-150	30	08/21/2021 0501
8:2 FTS	ND	15	11		1	76	19	67-138	30	08/21/2021 0501
6:2 FTS	ND	14	15		1	101	13	64-140	30	08/21/2021 0501
4:2 FTS	ND	14	13		1	88	1.7	63-143	30	08/21/2021 0501
GenX	ND	31	26		1	86	5.5	70-150	30	08/21/2021 0501
ADONA	ND	14	16		1	110	6.9	70-150	30	08/21/2021 0501
EtFOSAA	ND	15	13		1	86	2.9	61-135	30	08/21/2021 0501
MeFOSAA	ND	15	16		1	107	13	65-136	30	08/21/2021 0501
PFBS	8.7	13	23		1	104	7.9	72-130	30	08/21/2021 0501
PFDS	ND	15	13		1	92	0.36	53-142	30	08/21/2021 0501
PFHpS	ND	15	13		1	92	2.8	69-134	30	08/21/2021 0501
PFNS	ND	15	13		1	89	9.2	69-127	30	08/21/2021 0501
PFOSA	ND	15	14		1	91	1.2	67-137	30	08/21/2021 0501
PFPeS	3.2	14	18		1	104	9.9	71-127	30	08/21/2021 0501
PFHxS	15	14	27		1	84	11	68-131	30	08/21/2021 0501
PFBA	9.4	15	24		1	96	0.46	73-129	30	08/21/2021 0501
PFDA	ND	15	14		1	90	13	71-129	30	08/21/2021 0501
PFDoA	ND	15	16		1	103	3.9	72-134	30	08/21/2021 0501
PFHpA	ND	15	15		1	96	2.8	72-130	30	08/21/2021 0501
PFHxA	2.7	15	19		1	108	11	72-129	30	08/21/2021 0501
PFNA	ND	15	15		1	99	8.9	69-130	30	08/21/2021 0501
PFOA	4.4	15	20		1	102	1.9	71-133	30	08/21/2021 0501
PFPeA	1.1	15	16		1	95	0.12	72-129	30	08/21/2021 0501
PFTeDA	ND	15	16		1	104	2.9	71-132	30	08/21/2021 0501
PFTrDA	ND	15	15		1	98	1.5	65-144	30	08/21/2021 0501
PFUdA	ND	15	15		1	100	15	69-133	30	08/21/2021 0501
PFOS	4.0	14	16		1	86	12	65-140	30	08/21/2021 0501

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		123	50-150
13C2_6:2FTS		136	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		105	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Sample ID: WG31010-005MD
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		105	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122463

Client: Tetra Tech
Address: 1999 Harrison St
City: Oakland State: CA Zip Code: 94612
Project Name: NASA ARC PFAS
Project No.: 103IG667601 P.O. No.:

Report to Contact: Mike Dahlquist
Sampler's Signature: x [signature]
Printed Name: Callie Neaves, Anya Mikhercheva

Telephone No. / E-mail: (510)302-6310 / Mike.Dahlquist@tetratech.com
Sample No.:
Analysis (Attach list if more space is needed)
Page 1 of 1

WG31010
KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Matrix: Oil	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	NaOH/ ZnOAc	Field Filtered	PFAS (QSMB-15)	Remarks / Cooler I.D.
AOPC2,26-PFAS-C-072921	7/29/21	1100	G	X				2							X	
AOPC1-WU4-25-072921	7/29/21	1220	G	X				2							X	
ERB-02-072921	7/29/21	1630	G	X				2							X	
ERB-03-072921	7/29/21	1645	G	X				2							X	
AOPC2-PFAS-E-072921	7/29/21	1445	G	X				6							X	MS/MSD
AOPC2-PFAS-F-072921	7/29/21	1525	G	X				2							X	
AOPC2-PFAS-F-072921-FD	7/29/21	1525	G	X				2							X	Field duplicate
FB-16-072921	7/29/21	1700	G	X				2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)
Sample Disposal ☐ Return to Client ☐ Disposal by Lab
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	7/30/21	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/31/21	0905	4. Laboratory received by: [signature]	7/31/21	0905

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp 4.1 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: TETRA TECH Cooler Inspected by/date: JRG2 / 07/31/2021 Lot #: WG31910

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap Cup ID: NA

4.1 / 4.1 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote # NA

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA.

Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA _____ were received with bubbles >6 mm in diameter.

Samples(s) NA _____ were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JRG2 Date: 07/31/2021

Comments:

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dahlquist

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Lot Number:**WG31011**

Date Completed:08/22/2021

08/25/2021 9:31 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Tetra Tech
Lot Number: WG31011

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Samples WG31011-001, WG31011-006 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

For sample WG31011-004, sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Surrogate recovery may be adversely affected.

Sample WG31011-004 had the surrogate PFTeDA recovered outside of the acceptance limits due to matrix interference. The sample was reanalyzed at a dilution and both sets of data have been reported.

Surrogate recovery for the following samples was outside the upper control limit: WG31011-008, WG31011-009. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: WG31011-007. Re-extraction and/or re-analysis was performed with concurring results. Both sets of data have been reported.

The method blank associated with batch 12076 had 6:2 FTS detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for 6:2 FTS have been flagged with a "B".

The MS/MSD associated with sample WG31011-008 had multiple analytes recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample Summary

Tetra Tech

Lot Number: WG31011

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC2,26-D-072721	Aqueous	07/27/2021 1135	07/31/2021
002	AOPC4,11-H-072721	Aqueous	07/27/2021 1337	07/31/2021
003	AOPC1,7-UST29-MW02-072721	Aqueous	07/27/2021 1620	07/31/2021
004	AOPC1,7-W20-01-072721	Aqueous	07/27/2021 1820	07/31/2021
005	FB-14-072721	Aqueous	07/27/2021 1830	07/31/2021
006	AOPC2-PFAS-G-072821	Aqueous	07/28/2021 1025	07/31/2021
007	AOPC21-WSW-5-072821	Aqueous	07/28/2021 1210	07/31/2021
008	AOPC10-WGC2-11-072821	Aqueous	07/28/2021 1300	07/31/2021
009	AOPC9-W2-12-072821	Aqueous	07/28/2021 1430	07/31/2021
010	FB-15-072821	Aqueous	07/28/2021 1450	07/31/2021

(10 samples)

Detection Summary

Tetra Tech

Lot Number: WG31011

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	AOPC2,26-D-072721	Aqueous	6:2 FTS	PFAS by ID	33		ng/L	7
001	AOPC2,26-D-072721	Aqueous	PFBS	PFAS by ID	9.5		ng/L	7
001	AOPC2,26-D-072721	Aqueous	PFPeS	PFAS by ID	1.6	J	ng/L	7
001	AOPC2,26-D-072721	Aqueous	PFHxS	PFAS by ID	7.7		ng/L	7
001	AOPC2,26-D-072721	Aqueous	PFBA	PFAS by ID	13		ng/L	7
001	AOPC2,26-D-072721	Aqueous	PFOS	PFAS by ID	3.5	J	ng/L	7
002	AOPC4,11-H-072721	Aqueous	6:2 FTS	PFAS by ID	5.2	J	ng/L	9
002	AOPC4,11-H-072721	Aqueous	PFBS	PFAS by ID	1.2	J	ng/L	9
002	AOPC4,11-H-072721	Aqueous	PFHxS	PFAS by ID	2.1	J	ng/L	9
002	AOPC4,11-H-072721	Aqueous	PFBA	PFAS by ID	5.8		ng/L	9
002	AOPC4,11-H-072721	Aqueous	PFHpA	PFAS by ID	1.2	J	ng/L	9
002	AOPC4,11-H-072721	Aqueous	PFHxA	PFAS by ID	3.9		ng/L	9
002	AOPC4,11-H-072721	Aqueous	PFOA	PFAS by ID	16		ng/L	9
002	AOPC4,11-H-072721	Aqueous	PFPeA	PFAS by ID	3.9		ng/L	9
002	AOPC4,11-H-072721	Aqueous	PFOS	PFAS by ID	2.3	J	ng/L	9
003	AOPC1,7-UST29-MW02-072721	Aqueous	8:2 FTS	PFAS by ID	8.4		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	6:2 FTS	PFAS by ID	27		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFBS	PFAS by ID	130		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFHpS	PFAS by ID	27		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFOSA	PFAS by ID	1.9	J	ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFPeS	PFAS by ID	130		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFHxS	PFAS by ID	1200		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFBA	PFAS by ID	58		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFDA	PFAS by ID	1.1	J	ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFHpA	PFAS by ID	51		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFHxA	PFAS by ID	150		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFNA	PFAS by ID	4.2		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFOA	PFAS by ID	140		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFPeA	PFAS by ID	110		ng/L	11
003	AOPC1,7-UST29-MW02-072721	Aqueous	PFOS	PFAS by ID	1100		ng/L	11
004	AOPC1,7-W20-01-072721	Aqueous	8:2 FTS	PFAS by ID	7.9	J	ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	6:2 FTS	PFAS by ID	160		ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFBS	PFAS by ID	110		ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFHpS	PFAS by ID	95		ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFNS	PFAS by ID	3.9	J	ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFOSA	PFAS by ID	3.5	J	ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFPeS	PFAS by ID	190		ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFBA	PFAS by ID	200		ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFDA	PFAS by ID	5.3		ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFHpA	PFAS by ID	400		ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFHxA	PFAS by ID	620		ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFNA	PFAS by ID	36		ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFOA	PFAS by ID	240		ng/L	13

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
004	AOPC1,7-W20-01-072721	Aqueous	PFPeA	PFAS by ID	1400	E	ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFUdA	PFAS by ID	1.2	J	ng/L	13
004	AOPC1,7-W20-01-072721	Aqueous	PFHxS	PFAS by ID	2200		ng/L	15
004	AOPC1,7-W20-01-072721	Aqueous	PFOS	PFAS by ID	5000		ng/L	15
006	AOPC2-PFAS-G-072821	Aqueous	6:2 FTS	PFAS by ID	77		ng/L	19
006	AOPC2-PFAS-G-072821	Aqueous	PFBS	PFAS by ID	7.7		ng/L	19
006	AOPC2-PFAS-G-072821	Aqueous	PFPeS	PFAS by ID	1.9	J	ng/L	19
006	AOPC2-PFAS-G-072821	Aqueous	PFHxS	PFAS by ID	6.7		ng/L	19
006	AOPC2-PFAS-G-072821	Aqueous	PFBA	PFAS by ID	7.8		ng/L	19
006	AOPC2-PFAS-G-072821	Aqueous	PFOA	PFAS by ID	1.7	J	ng/L	19
006	AOPC2-PFAS-G-072821	Aqueous	PFOS	PFAS by ID	2.0	J	ng/L	19
007	AOPC21-WSW-5-072821	Aqueous	6:2 FTS	PFAS by ID	25	BQ	ng/L	21
007	AOPC21-WSW-5-072821	Aqueous	PFBS	PFAS by ID	14		ng/L	21
007	AOPC21-WSW-5-072821	Aqueous	PFOSA	PFAS by ID	1.2	J	ng/L	21
007	AOPC21-WSW-5-072821	Aqueous	PFPeS	PFAS by ID	7.3		ng/L	21
007	AOPC21-WSW-5-072821	Aqueous	PFHxS	PFAS by ID	83		ng/L	21
007	AOPC21-WSW-5-072821	Aqueous	PFBA	PFAS by ID	17		ng/L	21
007	AOPC21-WSW-5-072821	Aqueous	PFHpA	PFAS by ID	2.7	J	ng/L	21
007	AOPC21-WSW-5-072821	Aqueous	PFHxA	PFAS by ID	2.6	J	ng/L	21
007	AOPC21-WSW-5-072821	Aqueous	PFOA	PFAS by ID	27		ng/L	21
007	AOPC21-WSW-5-072821	Aqueous	PFPeA	PFAS by ID	1.7	J	ng/L	21
007	AOPC21-WSW-5-072821	Aqueous	PFOS	PFAS by ID	99		ng/L	21
008	AOPC10-WGC2-11-072821	Aqueous	6:2 FTS	PFAS by ID	34	S	ng/L	25
008	AOPC10-WGC2-11-072821	Aqueous	PFBS	PFAS by ID	37		ng/L	25
008	AOPC10-WGC2-11-072821	Aqueous	PFHpS	PFAS by ID	1.1	J	ng/L	25
008	AOPC10-WGC2-11-072821	Aqueous	PFPeS	PFAS by ID	27		ng/L	25
008	AOPC10-WGC2-11-072821	Aqueous	PFHxS	PFAS by ID	120	S	ng/L	25
008	AOPC10-WGC2-11-072821	Aqueous	PFBA	PFAS by ID	49		ng/L	25
008	AOPC10-WGC2-11-072821	Aqueous	PFHpA	PFAS by ID	0.93	J	ng/L	25
008	AOPC10-WGC2-11-072821	Aqueous	PFHxA	PFAS by ID	2.1	J	ng/L	25
008	AOPC10-WGC2-11-072821	Aqueous	PFOA	PFAS by ID	8.3		ng/L	25
008	AOPC10-WGC2-11-072821	Aqueous	PFPeA	PFAS by ID	2.3	J	ng/L	25
008	AOPC10-WGC2-11-072821	Aqueous	PFOS	PFAS by ID	32		ng/L	25
009	AOPC9-W2-12-072821	Aqueous	6:2 FTS	PFAS by ID	9.6		ng/L	27
009	AOPC9-W2-12-072821	Aqueous	PFBS	PFAS by ID	19		ng/L	27
009	AOPC9-W2-12-072821	Aqueous	PFHpS	PFAS by ID	2.2	J	ng/L	27
009	AOPC9-W2-12-072821	Aqueous	PFPeS	PFAS by ID	12		ng/L	27
009	AOPC9-W2-12-072821	Aqueous	PFHxS	PFAS by ID	110		ng/L	27
009	AOPC9-W2-12-072821	Aqueous	PFBA	PFAS by ID	22		ng/L	27
009	AOPC9-W2-12-072821	Aqueous	PFHpA	PFAS by ID	0.99	J	ng/L	27
009	AOPC9-W2-12-072821	Aqueous	PFHxA	PFAS by ID	2.7	J	ng/L	27
009	AOPC9-W2-12-072821	Aqueous	PFOA	PFAS by ID	48		ng/L	27
009	AOPC9-W2-12-072821	Aqueous	PFPeA	PFAS by ID	1.5	J	ng/L	27
009	AOPC9-W2-12-072821	Aqueous	PFOS	PFAS by ID	89		ng/L	27

(87 detections)

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-001
Description: AOPC2,26-D-072721 | Matrix: Aqueous
Date Sampled: 07/27/2021 1135 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2329	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	33		7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.5		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.6	J	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	7.7		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	13		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.5	J	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		98	50-150
13C2_6:2FTS		103	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		66	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		82	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31011-001
Description: AOPC2,26-D-072721			Matrix: Aqueous
Date Sampled: 07/27/2021 1135		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	50-150
13C8_PFOS		77	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-002
Description: AOPC4,11-H-072721 | Matrix: Aqueous
Date Sampled: 07/27/2021 1337 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2339	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.2	J	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.2	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	5.8		3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.2	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.9		3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	16		3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	3.9		3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.3	J	3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		134	50-150
13C2_6:2FTS		115	50-150
13C2_8:2FTS		118	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		99	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		110	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		105	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		101	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31011-002
Description: AOPC4,11-H-072721			Matrix: Aqueous
Date Sampled: 07/27/2021 1337		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		104	50-150
13C8_PFOS		99	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-003

Description: AOPC1,7-UST29-MW02-072721 | Matrix: Aqueous

Date Sampled: 07/27/2021 1620 | Project Name: NASA ARC PFAS

Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2350	JJG	08/12/2021 1807	12002
2	SOP SPE	PFAS by ID SOP QSM B-15	5	08/16/2021 1408	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	8.4		7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	27		7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	130		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	27		3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	J	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	130		3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1200		18	9.0	4.4	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	58		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.1	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	51		3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	150		3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	4.2		3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	140		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	110		3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1100		18	9.0	4.4	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		120	50-150		112	50-150
13C2_6:2FTS		118	50-150		128	50-150
13C2_8:2FTS		106	50-150		98	50-150
13C2_PFDoA		94	50-150		100	50-150
13C2_PFTeDA		88	50-150		107	50-150
13C3_PFBS		97	50-150		106	50-150
13C3_PFHxS		91	50-150		106	50-150
13C3-HFPO-DA		110	50-150		104	50-150
13C4_PFBA		101	50-150		103	50-150
13C4_PFHpA		101	50-150		112	50-150
13C5_PFHxA		100	50-150		105	50-150
13C5_PFPeA		103	50-150		99	50-150
13C6_PFDA		92	50-150		104	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-003
Description: AOPC1,7-UST29-MW02-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		102	50-150		105	50-150
13C8_PFOA		103	50-150		99	50-150
13C8_PFOS		92	50-150		104	50-150
13C8_PFOSA		91	50-150		110	50-150
13C9_PFNA		91	50-150		99	50-150
d5-EtFOSAA		94	50-150		102	50-150
d3-MeFOSAA		104	50-150		111	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-004
Description: AOPC1,7-W20-01-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1820
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/15/2021 0001	JJG	08/12/2021 1807	12002
2	SOP SPE	PFAS by ID SOP QSM B-15	20	08/16/2021 1511	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	7.9	J	8.1	4.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	160		8.1	4.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	110		4.0	2.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	95		4.0	2.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.9	J	4.0	2.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	3.5	J	4.0	2.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	190		4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2400	E	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	200		4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	5.3		4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	400		4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	620		4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	36		4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	240		4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1400	E	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	UQ	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.2	J	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5700	E	4.0	2.0	1.0	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		113	50-150		110	50-150
13C2_6:2FTS		93	50-150		95	50-150
13C2_8:2FTS		94	50-150		102	50-150
13C2_PFDoA		59	50-150		93	50-150
13C2_PFTeDA	N	33	50-150		95	50-150
13C3_PFBS		80	50-150		97	50-150
13C3_PFHxS		77	50-150		103	50-150
13C3-HFPO-DA		87	50-150		98	50-150
13C4_PFBA		73	50-150		97	50-150
13C4_PFHpA		83	50-150		95	50-150
13C5_PFHxA		79	50-150		100	50-150
13C5_PFPeA		78	50-150		94	50-150
13C6_PFDA		75	50-150		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-004
Description: AOPC1,7-W20-01-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1820
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		67	50-150		98	50-150
13C8_PFOA		75	50-150		89	50-150
13C8_PFOS		69	50-150		96	50-150
13C8_PFOSA		72	50-150		98	50-150
13C9_PFNA		66	50-150		97	50-150
d5-EtFOSAA		70	50-150		95	50-150
d3-MeFOSAA		74	50-150		107	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-004
Description: AOPC1,7-W20-01-072721 | Matrix: Aqueous
Date Sampled: 07/27/2021 1820 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/15/2021 0001	JJG	08/12/2021 1807	12002
2	SOP SPE	PFAS by ID SOP QSM B-15	20	08/16/2021 1511	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	80	U	160	80	40	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	80	U	160	80	40	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	80	U	160	80	40	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	180		160	80	40	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	80	U	160	80	40	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	80	U	160	80	40	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	80	U	160	80	40	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	80	U	160	80	40	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	80	U	160	80	40	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	110		81	41	20	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	76	J	81	41	20	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	200		81	41	20	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2200		81	41	20	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	180		81	41	20	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	400		81	41	20	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	570		81	41	20	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	33	J	81	41	20	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	210		81	41	20	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1400		81	41	20	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5000		81	41	20	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		113	50-150		110	50-150
13C2_6:2FTS		93	50-150		95	50-150
13C2_8:2FTS		94	50-150		102	50-150
13C2_PFDoA		59	50-150		93	50-150
13C2_PFTeDA	N	33	50-150		95	50-150
13C3_PFBS		80	50-150		97	50-150
13C3_PFHxS		77	50-150		103	50-150
13C3-HFPO-DA		87	50-150		98	50-150
13C4_PFBA		73	50-150		97	50-150
13C4_PFHpA		83	50-150		95	50-150
13C5_PFHxA		79	50-150		100	50-150
13C5_PFPeA		78	50-150		94	50-150
13C6_PFDA		75	50-150		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-004
Description: AOPC1,7-W20-01-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1820
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		67	50-150		98	50-150
13C8_PFOA		75	50-150		89	50-150
13C8_PFOS		69	50-150		96	50-150
13C8_PFOSA		72	50-150		98	50-150
13C9_PFNA		66	50-150		97	50-150
d5-EtFOSAA		70	50-150		95	50-150
d3-MeFOSAA		74	50-150		107	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-005
Description: FB-14-072721 | Matrix: Aqueous
Date Sampled: 07/27/2021 1830 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/21/2021 0511	JJG	08/18/2021 1159	12470

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		91	50-150
13C2_6:2FTS		132	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		59	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		92	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		84	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		75	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31011-005
Description: FB-14-072721			Matrix: Aqueous
Date Sampled: 07/27/2021 1830		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		96	50-150
13C8_PFOS		74	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-006
Description: AOPC2-PFAS-G-072821 | Matrix: Aqueous
Date Sampled: 07/28/2021 1025 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/21/2021 0522	JJG	08/18/2021 1159	12470

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	77		7.2	3.6	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.7		3.6	1.8	0.91	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	J	3.6	1.8	0.91	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	6.7		3.6	1.8	0.91	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	7.8		3.6	1.8	0.91	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	J	3.6	1.8	0.91	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	J	3.6	1.8	0.91	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		129	50-150
13C2_6:2FTS		109	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		62	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		85	50-150
13C3-HFPO-DA		106	50-150
13C4_PFBA		109	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		87	50-150
13C7_PFUdA		78	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31011-006
Description: AOPC2-PFAS-G-072821			Matrix: Aqueous
Date Sampled: 07/28/2021 1025		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		107	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		99	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-007
Description: AOPC21-WSW-5-072821 | Matrix: Aqueous
Date Sampled: 07/28/2021 1210 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/16/2021 1948	JJG	08/13/2021 1203	12076
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/21/2021 0533	JJG	08/18/2021 1159	12470

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	25	BQ	7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	14		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	7.3		3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	83		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	17		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.7	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.6	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	27		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	99		3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		134	50-150		132	50-150
13C2_6:2FTS	N	226	50-150	N	196	50-150
13C2_8:2FTS		115	50-150		127	50-150
13C2_PFDoA		105	50-150		98	50-150
13C2_PFTeDA		104	50-150		82	50-150
13C3_PFBS		115	50-150		99	50-150
13C3_PFHxS		104	50-150		95	50-150
13C3-HFPO-DA		106	50-150		109	50-150
13C4_PFBA		108	50-150		109	50-150
13C4_PFHpA		113	50-150		97	50-150
13C5_PFHxA		109	50-150		102	50-150
13C5_PFPeA		103	50-150		102	50-150
13C6_PFDA		102	50-150		95	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-007
Description: AOPC21-WSW-5-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		116	50-150		103	50-150
13C8_PFOA		102	50-150		117	50-150
13C8_PFOS		102	50-150		93	50-150
13C8_PFOSA		106	50-150		93	50-150
13C9_PFNA		105	50-150		105	50-150
d5-EtFOSAA		121	50-150		135	50-150
d3-MeFOSAA		113	50-150		135	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-007
Description: AOPC21-WSW-5-072821 | Matrix: Aqueous
Date Sampled: 07/28/2021 1210 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/16/2021 1948	JJG	08/13/2021 1203	12076
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/21/2021 0533	JJG	08/18/2021 1159	12470

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	30	Q	7.6	3.8	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	15		3.8	1.9	0.95	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.3	J	3.8	1.9	0.95	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.5	J	3.8	1.9	0.95	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	7.8		3.8	1.9	0.95	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	91		3.8	1.9	0.95	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	18		3.8	1.9	0.95	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.8	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.7	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	29		3.8	1.9	0.95	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	95		3.8	1.9	0.95	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		134	50-150		132	50-150
13C2_6:2FTS	N	226	50-150	N	196	50-150
13C2_8:2FTS		115	50-150		127	50-150
13C2_PFDoA		105	50-150		98	50-150
13C2_PFTeDA		104	50-150		82	50-150
13C3_PFBS		115	50-150		99	50-150
13C3_PFHxS		104	50-150		95	50-150
13C3-HFPO-DA		106	50-150		109	50-150
13C4_PFBA		108	50-150		109	50-150
13C4_PFHpA		113	50-150		97	50-150
13C5_PFHxA		109	50-150		102	50-150
13C5_PFPeA		103	50-150		102	50-150
13C6_PFDA		102	50-150		95	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-007
Description: AOPC21-WSW-5-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		116	50-150		103	50-150
13C8_PFOA		102	50-150		117	50-150
13C8_PFOS		102	50-150		93	50-150
13C8_PFOSA		106	50-150		93	50-150
13C9_PFNA		105	50-150		105	50-150
d5-EtFOSAA		121	50-150		135	50-150
d3-MeFOSAA		113	50-150		135	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-008
Description: AOPC10-WGC2-11-072821 | Matrix: Aqueous
Date Sampled: 07/28/2021 1300 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/15/2021 2133	MMM	08/13/2021 1902	12136

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	34	S	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	37		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.1	J	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	27		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	120	S	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	49		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.93	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.1	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	8.3		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.3	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	32		3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	155	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		111	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		110	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-008
Description: AOPC10-WGC2-11-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1300
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	50-150
13C8_PFOS		77	50-150
13C8_PFOSA		107	50-150
13C9_PFNA		91	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-009
Description: AOPC9-W2-12-072821 | Matrix: Aqueous
Date Sampled: 07/28/2021 1430 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/15/2021 2154	MMM	08/13/2021 1902	12136

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	9.6		7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	UQ	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	19		3.5	1.8	0.89	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.2	J	3.5	1.8	0.89	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	12		3.5	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	110		3.5	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	22		3.5	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.99	J	3.5	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.7	J	3.5	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	48		3.5	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.5	J	3.5	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	89		3.5	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	172	50-150
13C2_6:2FTS		129	50-150
13C2_8:2FTS		107	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		107	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		97	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-009
Description: AOPC9-W2-12-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		102	50-150
13C8_PFOS		90	50-150
13C8_PFOSA		98	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		106	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG31011-010
Description: FB-15-072821 | Matrix: Aqueous
Date Sampled: 07/28/2021 1450 | Project Name: NASA ARC PFAS
Date Received: 07/31/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/15/2021 2215	MMM	08/13/2021 1902	12136

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		116	50-150
13C2_6:2FTS		148	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		72	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		101	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		98	50-150
13C6_PFDA		84	50-150
13C7_PFUdA		103	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31011-010
Description: FB-15-072821			Matrix: Aqueous
Date Sampled: 07/28/2021 1450		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ12002-001
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12002-001
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		96	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12002-002
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	100	70-150	08/14/2021 2153
11Cl-PF3OUdS	15	13		1	88	70-150	08/14/2021 2153
8:2 FTS	15	16		1	107	67-138	08/14/2021 2153
6:2 FTS	15	17		1	114	64-140	08/14/2021 2153
4:2 FTS	15	17		1	117	63-143	08/14/2021 2153
GenX	32	33		1	104	70-150	08/14/2021 2153
ADONA	15	17		1	112	70-150	08/14/2021 2153
EtFOSAA	16	15		1	97	61-135	08/14/2021 2153
MeFOSAA	16	18		1	114	65-136	08/14/2021 2153
PFBS	14	15		1	105	72-130	08/14/2021 2153
PFDS	15	12		1	75	53-142	08/14/2021 2153
PFHpS	15	17		1	110	69-134	08/14/2021 2153
PFNS	15	16		1	102	69-127	08/14/2021 2153
PFOSA	16	16		1	102	67-137	08/14/2021 2153
PFPeS	15	15		1	100	71-127	08/14/2021 2153
PFHxS	15	15		1	100	68-131	08/14/2021 2153
PFBA	16	17		1	109	73-129	08/14/2021 2153
PFDA	16	17		1	104	71-129	08/14/2021 2153
PFDoA	16	19		1	118	72-134	08/14/2021 2153
PFHpA	16	17		1	106	72-130	08/14/2021 2153
PFHxA	16	16		1	103	72-129	08/14/2021 2153
PFNA	16	17		1	104	69-130	08/14/2021 2153
PFOA	16	17		1	108	71-133	08/14/2021 2153
PFPeA	16	17		1	105	72-129	08/14/2021 2153
PFTeDA	16	18		1	112	71-132	08/14/2021 2153
PFTrDA	16	17		1	108	65-144	08/14/2021 2153
PFUdA	16	19		1	119	69-133	08/14/2021 2153
PFOS	15	15		1	99	65-140	08/14/2021 2153

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		58	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12002-002
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		90	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12076-001
Batch: 12076
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1203

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
6:2 FTS	9.0		1	8.0	4.0	2.0	ng/L	08/16/2021 1751
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	50-150
13C2_6:2FTS		108	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		100	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		105	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		97	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12076-001
Batch: 12076
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1203

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		88	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12076-002
Batch: 12076
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1203

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	105	70-150	08/16/2021 1801
11Cl-PF3OUdS	15	15		1	96	70-150	08/16/2021 1801
8:2 FTS	15	15		1	95	67-138	08/16/2021 1801
6:2 FTS	15	20		1	134	64-140	08/16/2021 1801
4:2 FTS	15	16		1	105	63-143	08/16/2021 1801
GenX	32	32		1	99	70-150	08/16/2021 1801
ADONA	15	17		1	115	70-150	08/16/2021 1801
EtFOSAA	16	17		1	108	61-135	08/16/2021 1801
MeFOSAA	16	17		1	103	65-136	08/16/2021 1801
PFBS	14	17		1	117	72-130	08/16/2021 1801
PFDS	15	15		1	97	53-142	08/16/2021 1801
PFHpS	15	17		1	110	69-134	08/16/2021 1801
PFNS	15	15		1	99	69-127	08/16/2021 1801
PFOSA	16	16		1	97	67-137	08/16/2021 1801
PFPeS	15	16		1	106	71-127	08/16/2021 1801
PFHxS	15	17		1	120	68-131	08/16/2021 1801
PFBA	16	18		1	111	73-129	08/16/2021 1801
PFDA	16	17		1	108	71-129	08/16/2021 1801
PFDoA	16	17		1	109	72-134	08/16/2021 1801
PFHpA	16	16		1	102	72-130	08/16/2021 1801
PFHxA	16	17		1	106	72-129	08/16/2021 1801
PFNA	16	16		1	102	69-130	08/16/2021 1801
PFOA	16	18		1	115	71-133	08/16/2021 1801
PFPeA	16	18		1	115	72-129	08/16/2021 1801
PFTeDA	16	18		1	113	71-132	08/16/2021 1801
PFTrDA	16	17		1	106	65-144	08/16/2021 1801
PFUdA	16	16		1	102	69-133	08/16/2021 1801
PFOS	15	18		1	119	65-140	08/16/2021 1801

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		118	50-150
13C2_6:2FTS		103	50-150
13C2_8:2FTS		105	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		109	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		108	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12076-002
Batch: 12076
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1203

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	50-150
13C7_PFUdA		101	50-150
13C8_PFOA		90	50-150
13C8_PFOS		99	50-150
13C8_PFOSA		110	50-150
13C9_PFNA		102	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12136-001
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		116	50-150
13C2_6:2FTS		129	50-150
13C2_8:2FTS		101	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12136-001
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		90	50-150
13C7_PFUdA		98	50-150
13C8_PFOA		93	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12136-002
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	104	70-150	08/15/2021 2123
11Cl-PF3OUdS	15	16		1	106	70-150	08/15/2021 2123
8:2 FTS	15	14		1	91	67-138	08/15/2021 2123
6:2 FTS	15	16		1	103	64-140	08/15/2021 2123
4:2 FTS	15	13		1	86	63-143	08/15/2021 2123
GenX	32	30		1	93	70-150	08/15/2021 2123
ADONA	15	16		1	107	70-150	08/15/2021 2123
EtFOSAA	16	17		1	103	61-135	08/15/2021 2123
MeFOSAA	16	17		1	105	65-136	08/15/2021 2123
PFBS	14	15		1	109	72-130	08/15/2021 2123
PFDS	15	18		1	117	53-142	08/15/2021 2123
PFHpS	15	17		1	110	69-134	08/15/2021 2123
PFNS	15	17		1	110	69-127	08/15/2021 2123
PFOSA	16	15		1	95	67-137	08/15/2021 2123
PFPeS	15	17		1	114	71-127	08/15/2021 2123
PFHxS	15	14		1	95	68-131	08/15/2021 2123
PFBA	16	18		1	111	73-129	08/15/2021 2123
PFDA	16	18		1	113	71-129	08/15/2021 2123
PFDoA	16	17		1	108	72-134	08/15/2021 2123
PFHpA	16	18		1	114	72-130	08/15/2021 2123
PFHxA	16	18		1	111	72-129	08/15/2021 2123
PFNA	16	18		1	115	69-130	08/15/2021 2123
PFOA	16	16		1	99	71-133	08/15/2021 2123
PFPeA	16	16		1	100	72-129	08/15/2021 2123
PFTeDA	16	19		1	120	71-132	08/15/2021 2123
PFTrDA	16	18		1	114	65-144	08/15/2021 2123
PFUdA	16	19		1	120	69-133	08/15/2021 2123
PFOS	15	16		1	108	65-140	08/15/2021 2123

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		127	50-150
13C2_6:2FTS		113	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12136-002
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		81	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		98	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		98	50-150
13C9_PFNA		91	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG31011-008MS
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	15	19		1	124	70-150	08/15/2021 2144
11Cl-PF3OUdS	ND	15	16		1	107	70-150	08/15/2021 2144
8:2 FTS	ND	15	16		1	102	67-138	08/15/2021 2144
6:2 FTS	34	15	37	N	1	21	64-140	08/15/2021 2144
4:2 FTS	ND	15	18		1	121	63-143	08/15/2021 2144
GenX	ND	32	32		1	100	70-150	08/15/2021 2144
ADONA	ND	15	16		1	104	70-150	08/15/2021 2144
EtFOSAA	ND	16	15		1	95	61-135	08/15/2021 2144
MeFOSAA	ND	16	18		1	112	65-136	08/15/2021 2144
PFBS	37	14	55		1	126	72-130	08/15/2021 2144
PFDS	ND	16	18		1	113	53-142	08/15/2021 2144
PFHpS	1.1	15	19		1	114	69-134	08/15/2021 2144
PFNS	ND	15	17		1	112	69-127	08/15/2021 2144
PFOSA	ND	16	16		1	100	67-137	08/15/2021 2144
PFPeS	27	15	39		1	78	71-127	08/15/2021 2144
PFHxS	120	15	130	N	1	38	68-131	08/15/2021 2144
PFBA	49	16	65		1	98	73-129	08/15/2021 2144
PFDA	ND	16	19		1	118	71-129	08/15/2021 2144
PFDoA	ND	16	17		1	106	72-134	08/15/2021 2144
PFHpA	0.93	16	19		1	117	72-130	08/15/2021 2144
PFHxA	2.1	16	19		1	102	72-129	08/15/2021 2144
PFNA	ND	16	16		1	102	69-130	08/15/2021 2144
PFOA	8.3	16	25		1	101	71-133	08/15/2021 2144
PFPeA	2.3	16	18		1	96	72-129	08/15/2021 2144
PFTeDA	ND	16	18		1	111	71-132	08/15/2021 2144
PFTrDA	ND	16	17		1	108	65-144	08/15/2021 2144
PFUdA	ND	16	19		1	118	69-133	08/15/2021 2144
PFOS	32	15	49		1	117	65-140	08/15/2021 2144

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		145	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		110	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG31011-008MS
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		99	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG31011-009DU
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	08/15/2021 2205
11Cl-PF3OUdS	ND	ND		1	0.00	20	08/15/2021 2205
8:2 FTS	ND	ND		1	0.00	20	08/15/2021 2205
6:2 FTS	9.6	11		1	13	20	08/15/2021 2205
4:2 FTS	ND	ND		1	0.00	20	08/15/2021 2205
GenX	ND	ND		1	0.00	20	08/15/2021 2205
ADONA	ND	ND		1	0.00	20	08/15/2021 2205
EtFOSAA	ND	ND		1	0.00	20	08/15/2021 2205
MeFOSAA	ND	ND		1	0.00	20	08/15/2021 2205
PFBS	19	19		1	0.35	20	08/15/2021 2205
PFDS	ND	ND		1	0.00	20	08/15/2021 2205
PFHpS	2.2	2.8	+	1	24	20	08/15/2021 2205
PFNS	ND	ND		1	0.00	20	08/15/2021 2205
PFOSA	ND	ND		1	0.00	20	08/15/2021 2205
PFPeS	12	12		1	5.4	20	08/15/2021 2205
PFHxS	110	130		1	9.5	20	08/15/2021 2205
PFBA	22	21		1	4.8	20	08/15/2021 2205
PFDA	ND	ND		1	0.00	20	08/15/2021 2205
PFDoA	ND	ND		1	0.00	20	08/15/2021 2205
PFHpA	0.99	1.3	+	1	28	20	08/15/2021 2205
PFHxA	2.7	2.8	J	1	2.7	20	08/15/2021 2205
PFNA	ND	ND		1	0.00	20	08/15/2021 2205
PFOA	48	48		1	0.41	20	08/15/2021 2205
PFPeA	1.5	1.6	J	1	9.9	20	08/15/2021 2205
PFTeDA	ND	ND		1	0.00	20	08/15/2021 2205
PFTrDA	ND	ND		1	0.00	20	08/15/2021 2205
PFUdA	ND	ND		1	0.00	20	08/15/2021 2205
PFOS	89	89		1	0.47	20	08/15/2021 2205

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	161	50-150
13C2_6:2FTS	N	171	50-150
13C2_8:2FTS		105	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		96	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		109	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG31011-009DU
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		105	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		89	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		110	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12470-001
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		86	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12470-001
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		86	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12470-002
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	104	70-150	08/20/2021 2050
11Cl-PF3OUdS	15	14		1	91	70-150	08/20/2021 2050
8:2 FTS	15	17		1	110	67-138	08/20/2021 2050
6:2 FTS	15	15		1	97	64-140	08/20/2021 2050
4:2 FTS	15	13		1	89	63-143	08/20/2021 2050
GenX	32	30		1	94	70-150	08/20/2021 2050
ADONA	15	18		1	117	70-150	08/20/2021 2050
EtFOSAA	16	14		1	90	61-135	08/20/2021 2050
MeFOSAA	16	15		1	92	65-136	08/20/2021 2050
PFBS	14	14		1	97	72-130	08/20/2021 2050
PFDS	15	16		1	104	53-142	08/20/2021 2050
PFHpS	15	16		1	103	69-134	08/20/2021 2050
PFNS	15	16		1	104	69-127	08/20/2021 2050
PFOSA	16	17		1	107	67-137	08/20/2021 2050
PFPeS	15	15		1	103	71-127	08/20/2021 2050
PFHxS	15	15		1	101	68-131	08/20/2021 2050
PFBA	16	16		1	99	73-129	08/20/2021 2050
PFDA	16	18		1	110	71-129	08/20/2021 2050
PFDoA	16	18		1	111	72-134	08/20/2021 2050
PFHpA	16	17		1	108	72-130	08/20/2021 2050
PFHxA	16	17		1	105	72-129	08/20/2021 2050
PFNA	16	17		1	105	69-130	08/20/2021 2050
PFOA	16	17		1	105	71-133	08/20/2021 2050
PFPeA	16	16		1	102	72-129	08/20/2021 2050
PFTeDA	16	16		1	102	71-132	08/20/2021 2050
PFTrDA	16	16		1	99	65-144	08/20/2021 2050
PFUdA	16	17		1	109	69-133	08/20/2021 2050
PFOS	15	15		1	102	65-140	08/20/2021 2050

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12470-002
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		92	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122461

Client: Tetra Tech
Address: 1999 Harrison St
City: Oakland | State: CA | Zip Code: 94612
Project Name: NASA ARC PFAS
Project No.: 103IG667601 | P.O. No.:

Report to Contact: Mike Dahlquist
Sampler's Signature: X [signature]
Printed Name: Ryan Melendez, Anya Mikheucheva

Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com
Quote No.:
Analysis (Attach list if more space is needed)
Page 1 of 2
Lot # Bar Code: WG31011
KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	HNO3	HCl	NaOH	5035 Kit	Other Filtered	PFAS (QSMB-15)	Remarks / Cooler I.D.
AOPC 2,26-D-072721	7/27/21	1135	G	X			2						X	
AOPC 4,11-H-072721	7/27/21	1337	G	X			2						X	
AOPC 1,7-UST29-MW02-072721	7/27/21	1620	G	X			2						X	
AOPC 1,7-W20-01-072721	07/27/21	1820	G	X			2						X	
FB-14-072721	07/27/21	1830	G	X			2						X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)
Sample Disposal ☐ Return to Client ☐ Disposal by Lab
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	7/30/21	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/31/21	0905	4. Laboratory received by: [signature]	7/31/21	0905

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack
Receipt Temp. 4.2 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122462

Client: Tetra Tech
Address: 1999 Harrison St
City: Oakland | State: CA | Zip Code: 94612
Project Name: NASA ARC PFAS
Project No.: 103IG667601 | P.O. No.:

Report to Contact: Mike Dahlquist
Sampler's Signature: x [signature]
Printed Name: Callie Neaves, Ryan Melendez

Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com
Quote No.:
Analysis (Attach list if more space is needed)
Page 2 of 2

WG31011
KES3

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Collection Code/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Liquid	H2SO4	HNO3	HCl	NaOH	5035 w/	Field Filtered	PFAS (QSMB-15)	Remarks / Cooler I.D.
AOPC2-PFAS-G-072821	7/28/21	1025	G	X			2							X	
AOPC21-WSW-5-072821	7/28/21	1210	G	X			2							X	
AOPC10-WGC2-11-072821	7/28/21	1300	G	X			2							X	
AOPC9-W2-12-072821	7/28/21	1430	G	X			2							X	
FB-15-072821	7/28/21	1450	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)
Sample Disposal ☐ Return to Client ☐ Disposal by Lab
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TE [signature]	7/30/21	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/31/21	0905	4. Laboratory received by: [signature]	7/31/21	0905

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack
Receipt Temp. 4.2 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: TETRA TECH Cooler Inspected by/date: JRG2 / 07/31/2021 Lot #: WG31011

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

4.2 / 4.2 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote # NA

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JRG2 Date: 07/31/2021

Comments:

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dahlquist

Project Name: NASA Ames PFAS

Project Number: 103IG667601

Lot Number:**WH13098**

Date Completed:09/30/2021

09/30/2021 10:52 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Case Narrative
Tetra Tech
Lot Number: WH13098

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation:

Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, Fecal Coliform SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, Solid Chemical Material: TOC Walkley-Black.

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

Samples WH13098-008, WH13098-012 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

The method blank for prep batch 14518 contained analyte: 6:2FTS greater than the acceptance criteria. The associated sample, WH13098-011, contained detections for this analyte at concentrations greater than 10X the value found in the method blank; therefore sample results are not impacted. The data has been reported.

Surrogate recovery for the following sample(s) was outside the upper control limit: WH13098-001, WH13098-003, WH13098-010, WH13098-011, WH13098-012. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

The continuing calibration verification (CCV) associated with sample(s) WH13098-010, WH13098-012 was outside of criteria for the following analyte(s): 4:2 and 6:2FTS surrogates/EIS recovered high. Associated target analytes recovered within limits The data has been reported.

Sample Summary

Tetra Tech

Lot Number: WH13098

Project Name: NASA Ames PFAS

Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	IDW-GW-01-08112021	Aqueous	08/11/2021 1000	08/13/2021
002	IDW-GW-02-08112021	Aqueous	08/11/2021 1020	08/13/2021
003	IDW-GW-03-08112021	Aqueous	08/11/2021 1040	08/13/2021
004	IDW-GW-04-08112021	Aqueous	08/11/2021 1100	08/13/2021
005	IDW-GW-05-08112021	Aqueous	08/11/2021 1120	08/13/2021
006	IDW-GW-06-08112021	Aqueous	08/11/2021 1140	08/13/2021
007	IDW-GW-07-08112021	Aqueous	08/11/2021 1200	08/13/2021
008	IDW-GW-08-08112021	Aqueous	08/11/2021 1220	08/13/2021
009	IDW-GW-09-08112021	Aqueous	08/11/2021 1240	08/13/2021
010	IDW-GW-10-08112021	Aqueous	08/11/2021 1300	08/13/2021
011	IDW-GW-11-08112021	Aqueous	08/11/2021 1320	08/13/2021
012	IDW-GW-12-08112021	Aqueous	08/11/2021 1340	08/13/2021

(12 samples)

Detection Summary

Tetra Tech

Lot Number: WH13098

Project Name: NASA Ames PFAS

Project Number: 103IG667601

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	IDW-GW-01-08112021	Aqueous	6:2 FTS	PFAS by ID	130		ng/L	10
001	IDW-GW-01-08112021	Aqueous	PFHpS	PFAS by ID	26		ng/L	10
001	IDW-GW-01-08112021	Aqueous	PFPeS	PFAS by ID	49		ng/L	10
001	IDW-GW-01-08112021	Aqueous	PFHxS	PFAS by ID	430		ng/L	10
001	IDW-GW-01-08112021	Aqueous	PFBA	PFAS by ID	33		ng/L	10
001	IDW-GW-01-08112021	Aqueous	PFHpA	PFAS by ID	28		ng/L	10
001	IDW-GW-01-08112021	Aqueous	PFHxA	PFAS by ID	140		ng/L	10
001	IDW-GW-01-08112021	Aqueous	PFNA	PFAS by ID	2.8	J	ng/L	10
001	IDW-GW-01-08112021	Aqueous	PFOA	PFAS by ID	46		ng/L	10
001	IDW-GW-01-08112021	Aqueous	PFPeA	PFAS by ID	90		ng/L	10
001	IDW-GW-01-08112021	Aqueous	PFOS	PFAS by ID	1600		ng/L	10
002	IDW-GW-02-08112021	Aqueous	8:2 FTS	PFAS by ID	2.2	J	ng/L	12
002	IDW-GW-02-08112021	Aqueous	6:2 FTS	PFAS by ID	270		ng/L	12
002	IDW-GW-02-08112021	Aqueous	4:2 FTS	PFAS by ID	3.0	J	ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFBS	PFAS by ID	78		ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFHpS	PFAS by ID	25		ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFNS	PFAS by ID	3.4	J	ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFPeS	PFAS by ID	69		ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFHxS	PFAS by ID	420		ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFBA	PFAS by ID	46		ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFHpA	PFAS by ID	43		ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFHxA	PFAS by ID	210		ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFNA	PFAS by ID	3.4	J	ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFOA	PFAS by ID	70		ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFPeA	PFAS by ID	110		ng/L	12
002	IDW-GW-02-08112021	Aqueous	PFOS	PFAS by ID	1900		ng/L	12
003	IDW-GW-03-08112021	Aqueous	6:2 FTS	PFAS by ID	51		ng/L	14
003	IDW-GW-03-08112021	Aqueous	PFPeS	PFAS by ID	4.7		ng/L	14
003	IDW-GW-03-08112021	Aqueous	PFHxS	PFAS by ID	31		ng/L	14
003	IDW-GW-03-08112021	Aqueous	PFBA	PFAS by ID	15		ng/L	14
003	IDW-GW-03-08112021	Aqueous	PFHpA	PFAS by ID	3.2	J	ng/L	14
003	IDW-GW-03-08112021	Aqueous	PFHxA	PFAS by ID	7.5		ng/L	14
003	IDW-GW-03-08112021	Aqueous	PFNA	PFAS by ID	2.0	J	ng/L	14
003	IDW-GW-03-08112021	Aqueous	PFOA	PFAS by ID	10		ng/L	14
003	IDW-GW-03-08112021	Aqueous	PFPeA	PFAS by ID	7.0		ng/L	14
003	IDW-GW-03-08112021	Aqueous	PFOS	PFAS by ID	33		ng/L	14
004	IDW-GW-04-08112021	Aqueous	PFBS	PFAS by ID	11		ng/L	16
004	IDW-GW-04-08112021	Aqueous	PFPeS	PFAS by ID	2.8	J	ng/L	16
004	IDW-GW-04-08112021	Aqueous	PFHxS	PFAS by ID	13		ng/L	16
004	IDW-GW-04-08112021	Aqueous	PFBA	PFAS by ID	8.0		ng/L	16
004	IDW-GW-04-08112021	Aqueous	PFHxA	PFAS by ID	1.3	J	ng/L	16
004	IDW-GW-04-08112021	Aqueous	PFOA	PFAS by ID	3.7	J	ng/L	16
004	IDW-GW-04-08112021	Aqueous	PFPeA	PFAS by ID	1.2	J	ng/L	16

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
004	IDW-GW-04-08112021	Aqueous	PFOS	PFAS by ID	8.3		ng/L	16
005	IDW-GW-05-08112021	Aqueous	6:2 FTS	PFAS by ID	66		ng/L	18
005	IDW-GW-05-08112021	Aqueous	PFBS	PFAS by ID	18		ng/L	18
005	IDW-GW-05-08112021	Aqueous	PFPeS	PFAS by ID	21		ng/L	18
005	IDW-GW-05-08112021	Aqueous	PFHxS	PFAS by ID	190		ng/L	18
005	IDW-GW-05-08112021	Aqueous	PFBA	PFAS by ID	79		ng/L	18
005	IDW-GW-05-08112021	Aqueous	PFHpA	PFAS by ID	51		ng/L	18
005	IDW-GW-05-08112021	Aqueous	PFHxA	PFAS by ID	170		ng/L	18
005	IDW-GW-05-08112021	Aqueous	PFOA	PFAS by ID	22		ng/L	18
005	IDW-GW-05-08112021	Aqueous	PFPeA	PFAS by ID	190		ng/L	18
005	IDW-GW-05-08112021	Aqueous	PFOS	PFAS by ID	130		ng/L	18
006	IDW-GW-06-08112021	Aqueous	PFBS	PFAS by ID	8.2		ng/L	20
006	IDW-GW-06-08112021	Aqueous	PFPeS	PFAS by ID	3.1	J	ng/L	20
006	IDW-GW-06-08112021	Aqueous	PFHxS	PFAS by ID	27		ng/L	20
006	IDW-GW-06-08112021	Aqueous	PFBA	PFAS by ID	3.8	J	ng/L	20
006	IDW-GW-06-08112021	Aqueous	PFHxA	PFAS by ID	1.9	J	ng/L	20
006	IDW-GW-06-08112021	Aqueous	PFNA	PFAS by ID	3.1	J	ng/L	20
006	IDW-GW-06-08112021	Aqueous	PFOA	PFAS by ID	2.5	J	ng/L	20
006	IDW-GW-06-08112021	Aqueous	PFPeA	PFAS by ID	1.7	J	ng/L	20
006	IDW-GW-06-08112021	Aqueous	PFOS	PFAS by ID	24		ng/L	20
007	IDW-GW-07-08112021	Aqueous	6:2 FTS	PFAS by ID	4.2	J	ng/L	22
007	IDW-GW-07-08112021	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	22
007	IDW-GW-07-08112021	Aqueous	PFHxS	PFAS by ID	9.9		ng/L	22
007	IDW-GW-07-08112021	Aqueous	PFBA	PFAS by ID	18		ng/L	22
007	IDW-GW-07-08112021	Aqueous	PFHpA	PFAS by ID	4.6		ng/L	22
007	IDW-GW-07-08112021	Aqueous	PFHxA	PFAS by ID	16		ng/L	22
007	IDW-GW-07-08112021	Aqueous	PFNA	PFAS by ID	1.8	J	ng/L	22
007	IDW-GW-07-08112021	Aqueous	PFOA	PFAS by ID	71		ng/L	22
007	IDW-GW-07-08112021	Aqueous	PFPeA	PFAS by ID	8.3		ng/L	22
007	IDW-GW-07-08112021	Aqueous	PFOS	PFAS by ID	32		ng/L	22
008	IDW-GW-08-08112021	Aqueous	PFBS	PFAS by ID	8.3		ng/L	24
008	IDW-GW-08-08112021	Aqueous	PFPeS	PFAS by ID	1.6	J	ng/L	24
008	IDW-GW-08-08112021	Aqueous	PFHxS	PFAS by ID	7.0		ng/L	24
008	IDW-GW-08-08112021	Aqueous	PFBA	PFAS by ID	15		ng/L	24
008	IDW-GW-08-08112021	Aqueous	PFHxA	PFAS by ID	4.0		ng/L	24
008	IDW-GW-08-08112021	Aqueous	PFNA	PFAS by ID	2.3	J	ng/L	24
008	IDW-GW-08-08112021	Aqueous	PFOA	PFAS by ID	5.7		ng/L	24
008	IDW-GW-08-08112021	Aqueous	PFPeA	PFAS by ID	3.2	J	ng/L	24
008	IDW-GW-08-08112021	Aqueous	PFOS	PFAS by ID	5.6		ng/L	24
009	IDW-GW-09-08112021	Aqueous	PFBS	PFAS by ID	9.1		ng/L	26
009	IDW-GW-09-08112021	Aqueous	PFPeS	PFAS by ID	2.9	J	ng/L	26
009	IDW-GW-09-08112021	Aqueous	PFHxS	PFAS by ID	23		ng/L	26
009	IDW-GW-09-08112021	Aqueous	PFBA	PFAS by ID	7.4		ng/L	26
009	IDW-GW-09-08112021	Aqueous	PFHxA	PFAS by ID	2.4	J	ng/L	26
009	IDW-GW-09-08112021	Aqueous	PFOA	PFAS by ID	4.7		ng/L	26
009	IDW-GW-09-08112021	Aqueous	PFPeA	PFAS by ID	1.7	J	ng/L	26
009	IDW-GW-09-08112021	Aqueous	PFOS	PFAS by ID	35		ng/L	26
010	IDW-GW-10-08112021	Aqueous	PFBS	PFAS by ID	8.4		ng/L	28

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
010	IDW-GW-10-08112021	Aqueous	PFPeS	PFAS by ID	1.6	J	ng/L	28
010	IDW-GW-10-08112021	Aqueous	PFHxS	PFAS by ID	6.3		ng/L	28
010	IDW-GW-10-08112021	Aqueous	PFBA	PFAS by ID	14		ng/L	28
010	IDW-GW-10-08112021	Aqueous	PFDA	PFAS by ID	2.9	J	ng/L	28
010	IDW-GW-10-08112021	Aqueous	PFHpA	PFAS by ID	3.5	J	ng/L	28
010	IDW-GW-10-08112021	Aqueous	PFHxA	PFAS by ID	3.6	J	ng/L	28
010	IDW-GW-10-08112021	Aqueous	PFNA	PFAS by ID	2.4	J	ng/L	28
010	IDW-GW-10-08112021	Aqueous	PFOA	PFAS by ID	16		ng/L	28
010	IDW-GW-10-08112021	Aqueous	PFPeA	PFAS by ID	1.8	J	ng/L	28
010	IDW-GW-10-08112021	Aqueous	PFOS	PFAS by ID	3.0	J	ng/L	28
011	IDW-GW-11-08112021	Aqueous	6:2 FTS	PFAS by ID	69	B	ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFBS	PFAS by ID	20		ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFHpS	PFAS by ID	4.2		ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFPeS	PFAS by ID	20		ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFHxS	PFAS by ID	180		ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFBA	PFAS by ID	74		ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFHpA	PFAS by ID	54		ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFHxA	PFAS by ID	160		ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFNA	PFAS by ID	1.2	J	ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFOA	PFAS by ID	19		ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFPeA	PFAS by ID	190		ng/L	30
011	IDW-GW-11-08112021	Aqueous	PFOS	PFAS by ID	140		ng/L	30
012	IDW-GW-12-08112021	Aqueous	6:2 FTS	PFAS by ID	4.8	BJ	ng/L	32
012	IDW-GW-12-08112021	Aqueous	PFHxS	PFAS by ID	1.6	J	ng/L	32
012	IDW-GW-12-08112021	Aqueous	PFBA	PFAS by ID	5.9		ng/L	32
012	IDW-GW-12-08112021	Aqueous	PFHpA	PFAS by ID	1.4	J	ng/L	32
012	IDW-GW-12-08112021	Aqueous	PFHxA	PFAS by ID	4.4		ng/L	32
012	IDW-GW-12-08112021	Aqueous	PFOA	PFAS by ID	15		ng/L	32
012	IDW-GW-12-08112021	Aqueous	PFPeA	PFAS by ID	3.6	J	ng/L	32
012	IDW-GW-12-08112021	Aqueous	PFOS	PFAS by ID	1.9	J	ng/L	32

(121 detections)

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH13098-001
Description: IDW-GW-01-08112021
Matrix: Aqueous
Date Sampled: 08/11/2021 1000
Project Name: NASA Ames PFAS
Date Received: 08/13/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/04/2021 2145	JJG	09/02/2021 1801	14296
2	SOP SPE	PFAS by ID SOP QSM B-15	5	09/09/2021 0008	JJG	09/02/2021 1801	14296
3	SOP SPE	PFAS by ID SOP QSM B-15	1	09/09/2021 1950	SES	09/08/2021 1730	14781

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	UQ	6.8	3.4	1.7	ng/L	3
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	130		7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	26		3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	49		3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	430		3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	33		3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	28		3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	140		3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.8	J	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	46		3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	90		3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1600		18	9.0	4.5	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS	N	280	50-150		121	50-150	N	317	50-150
13C2_6:2FTS	N	208	50-150		107	50-150	N	308	50-150
13C2_8:2FTS	N	217	50-150		124	50-150	N	247	50-150
13C2_PFDoA		72	50-150		114	50-150	N	48	50-150
13C2_PFTeDA	N	37	50-150		91	50-150	N	38	50-150
13C3_PFBS		100	50-150		105	50-150		88	50-150
13C3_PFHxS		99	50-150		109	50-150		89	50-150
13C3-HFPO-DA		95	50-150		95	50-150		89	50-150
13C4_PFBA		69	50-150		111	50-150		53	50-150
13C4_PFHpA		105	50-150		105	50-150		92	50-150
13C5_PFHxA		98	50-150		97	50-150		93	50-150
13C5_PFPeA		102	50-150		107	50-150		94	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH13098-001
Description: IDW-GW-01-08112021
Matrix: Aqueous
Date Sampled: 08/11/2021 1000
Project Name: NASA Ames PFAS
Date Received: 08/13/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		104	50-150		101	50-150		102	50-150
13C7_PFUdA		96	50-150		111	50-150		74	50-150
13C8_PFOA		99	50-150		102	50-150		82	50-150
13C8_PFOS		97	50-150		99	50-150		87	50-150
13C8_PFOSA		118	50-150		89	50-150		100	50-150
13C9_PFNA		98	50-150		93	50-150		106	50-150
d5-EtFOSAA		125	50-150		117	50-150		92	50-150
d3-MeFOSAA		84	50-150		125	50-150		88	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WH13098-002
Description: IDW-GW-02-08112021 | Matrix: Aqueous
Date Sampled: 08/11/2021 1020 | Project Name: NASA Ames PFAS
Date Received: 08/13/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/04/2021 2156	JJG	09/02/2021 1801	14296
2	SOP SPE	PFAS by ID SOP QSM B-15	5	09/09/2021 0019	JJG	09/02/2021 1801	14296

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	2.2	J	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	270		7.4	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.0	J	7.4	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	78		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	25		3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.4	J	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	69		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	420		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	46		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	43		3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	210		3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	3.4	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	70		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	110		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1900		18	9.0	4.6	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		134	50-150		113	50-150
13C2_6:2FTS		119	50-150		120	50-150
13C2_8:2FTS		90	50-150		103	50-150
13C2_PFDoA		80	50-150		140	50-150
13C2_PFTeDA		86	50-150		116	50-150
13C3_PFBS		97	50-150		114	50-150
13C3_PFHxS		99	50-150		115	50-150
13C3-HFPO-DA		93	50-150		101	50-150
13C4_PFBA		81	50-150		108	50-150
13C4_PFHpA		93	50-150		115	50-150
13C5_PFHxA		95	50-150		110	50-150
13C5_PFPeA		94	50-150		109	50-150
13C6_PFDA		91	50-150		103	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH13098-002
Description: IDW-GW-02-08112021
Matrix: Aqueous
Date Sampled: 08/11/2021 1020
Project Name: NASA Ames PFAS
Date Received: 08/13/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		88	50-150		118	50-150
13C8_PFOA		98	50-150		109	50-150
13C8_PFOS		88	50-150		111	50-150
13C8_PFOSA		113	50-150		107	50-150
13C9_PFNA		89	50-150		99	50-150
d5-EtFOSAA		96	50-150		113	50-150
d3-MeFOSAA		100	50-150		114	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WH13098-003
Description: IDW-GW-03-08112021 | Matrix: Aqueous
Date Sampled: 08/11/2021 1040 | Project Name: NASA Ames PFAS
Date Received: 08/13/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/04/2021 2228	JJG	09/02/2021 1801	14296

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	51		7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.7		3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	31		3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	15		3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	3.2	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.5		3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	10		3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	7.0		3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	33		3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	357	50-150
13C2_6:2FTS	N	353	50-150
13C2_8:2FTS	N	281	50-150
13C2_PFDoA	N	39	50-150
13C2_PFTeDA	N	35	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA	N	39	50-150
13C4_PFHpA		111	50-150
13C5_PFHxA		110	50-150
13C5_PFPeA		93	50-150
13C6_PFDA		87	50-150
13C7_PFUdA	N	43	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WH13098-003
Description: IDW-GW-03-08112021			Matrix: Aqueous
Date Sampled: 08/11/2021 1040		Project Name: NASA Ames PFAS	
Date Received: 08/13/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		117	50-150
13C8_PFOS		103	50-150
13C8_PFOSA		93	50-150
13C9_PFNA		121	50-150
d5-EtFOSAA	N	26	50-150
d3-MeFOSAA	N	15	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WH13098-004
Description: IDW-GW-04-08112021 | Matrix: Aqueous
Date Sampled: 08/11/2021 1100 | Project Name: NASA Ames PFAS
Date Received: 08/13/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/04/2021 1917	JJG	09/02/2021 1801	14296

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	11		4.3	2.2	1.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.8	J	4.3	2.2	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	13		4.3	2.2	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	8.0		4.3	2.2	1.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.3	J	4.3	2.2	1.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.7	J	4.3	2.2	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.2	J	4.3	2.2	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	8.3		4.3	2.2	1.1	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		122	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		93	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		101	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		105	50-150
13C6_PFDA		93	50-150
13C7_PFUdA		89	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WH13098-004
Description: IDW-GW-04-08112021			Matrix: Aqueous
Date Sampled: 08/11/2021 1100		Project Name: NASA Ames PFAS	
Date Received: 08/13/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	50-150
13C8_PFOS		93	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH13098-005
Description: IDW-GW-05-08112021
Matrix: Aqueous
Date Sampled: 08/11/2021 1120
Project Name: NASA Ames PFAS
Date Received: 08/13/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/04/2021 1927	JJG	09/02/2021 1801	14296

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	66		10	5.0	2.5	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	18		5.0	2.5	1.3	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.5	U	5.0	2.5	1.3	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.5	U	5.0	2.5	1.3	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.5	U	5.0	2.5	1.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.5	U	5.0	2.5	1.3	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	21		5.0	2.5	1.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	190		5.0	2.5	1.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	79		5.0	2.5	1.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.5	U	5.0	2.5	1.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.5	U	5.0	2.5	1.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	51		5.0	2.5	1.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	170		5.0	2.5	1.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.5	U	5.0	2.5	1.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	22		5.0	2.5	1.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190		5.0	2.5	1.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.5	U	5.0	2.5	1.3	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.5	U	5.0	2.5	1.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.5	U	5.0	2.5	1.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	130		5.0	2.5	1.3	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		133	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		93	50-150
13C3_PFBS		105	50-150
13C3_PFHxS		105	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		106	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		99	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WH13098-005
Description: IDW-GW-05-08112021			Matrix: Aqueous
Date Sampled: 08/11/2021 1120		Project Name: NASA Ames PFAS	
Date Received: 08/13/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		93	50-150
13C8_PFOSA		112	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH13098-006
Description: IDW-GW-06-08112021
Matrix: Aqueous
Date Sampled: 08/11/2021 1140
Project Name: NASA Ames PFAS
Date Received: 08/13/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/04/2021 1938	JJG	09/02/2021 1801	14296

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.2		4.0	2.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.1	J	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	27		4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.8	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	3.1	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.5	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	24		4.0	2.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		95	50-150
13C2_6:2FTS		111	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		90	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		92	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WH13098-006
Description: IDW-GW-06-08112021			Matrix: Aqueous
Date Sampled: 08/11/2021 1140		Project Name: NASA Ames PFAS	
Date Received: 08/13/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		102	50-150
13C8_PFOS		101	50-150
13C8_PFOSA		111	50-150
13C9_PFNA		91	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH13098-007
Description: IDW-GW-07-08112021
Matrix: Aqueous
Date Sampled: 08/11/2021 1200
Project Name: NASA Ames PFAS
Date Received: 08/13/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/04/2021 1948	JJG	09/02/2021 1801	14296

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.2	J	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	J	3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	9.9		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	18		3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	4.6		3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	16		3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	71		3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	8.3		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	32		3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		146	50-150
13C2_6:2FTS		129	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		87	50-150
13C7_PFUdA		88	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WH13098-007
Description: IDW-GW-07-08112021			Matrix: Aqueous
Date Sampled: 08/11/2021 1200		Project Name: NASA Ames PFAS	
Date Received: 08/13/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	50-150
13C8_PFOS		91	50-150
13C8_PFOSA		104	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WH13098-008
Description: IDW-GW-08-08112021 | Matrix: Aqueous
Date Sampled: 08/11/2021 1220 | Project Name: NASA Ames PFAS
Date Received: 08/13/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/04/2021 2020	JJG	09/02/2021 1801	14296

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.3		3.7	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.6	J	3.7	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	7.0		3.7	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	15		3.7	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.0		3.7	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.3	J	3.7	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	5.7		3.7	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	3.2	J	3.7	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5.6		3.7	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		102	50-150
13C2_6:2FTS		104	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		76	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WH13098-008
Description: IDW-GW-08-08112021			Matrix: Aqueous
Date Sampled: 08/11/2021 1220		Project Name: NASA Ames PFAS	
Date Received: 08/13/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	50-150
13C8_PFOS		87	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH13098-009
Description: IDW-GW-09-08112021
Matrix: Aqueous
Date Sampled: 08/11/2021 1240
Project Name: NASA Ames PFAS
Date Received: 08/13/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/04/2021 2031	JJG	09/02/2021 1801	14296

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.5	U	9.0	4.5	2.3	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.5	U	9.0	4.5	2.3	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.5	U	9.0	4.5	2.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.5	U	9.0	4.5	2.3	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.5	U	9.0	4.5	2.3	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.5	U	9.0	4.5	2.3	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.5	U	9.0	4.5	2.3	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.5	U	9.0	4.5	2.3	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.5	U	9.0	4.5	2.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.1		4.5	2.3	1.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.9	J	4.5	2.3	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	23		4.5	2.3	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	7.4		4.5	2.3	1.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.4	J	4.5	2.3	1.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.7		4.5	2.3	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	J	4.5	2.3	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	35		4.5	2.3	1.1	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		122	50-150
13C2_6:2FTS		109	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		95	50-150
13C3_PFBS		108	50-150
13C3_PFHxS		105	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		95	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WH13098-009
Description: IDW-GW-09-08112021			Matrix: Aqueous
Date Sampled: 08/11/2021 1240		Project Name: NASA Ames PFAS	
Date Received: 08/13/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		99	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		112	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		106	50-150
d3-MeFOSAA		111	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WH13098-010
Description: IDW-GW-10-08112021 | Matrix: Aqueous
Date Sampled: 08/11/2021 1300 | Project Name: NASA Ames PFAS
Date Received: 08/13/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/08/2021 1137	MMM	09/05/2021 1446	14518
2	SOP SPE	PFAS by ID SOP QSM B-15	1	09/15/2021 1956	MMM	09/14/2021 1619	15321

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.7	U	9.4	4.7	2.4	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.7	U	9.4	4.7	2.4	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.7	U	9.4	4.7	2.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.3	UQ	8.6	4.3	2.2	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.7	UQ	9.4	4.7	2.4	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.7	U	9.4	4.7	2.4	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.7	U	9.4	4.7	2.4	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.7	U	9.4	4.7	2.4	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.7	U	9.4	4.7	2.4	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.4		4.7	2.4	1.2	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.6	J	4.7	2.4	1.2	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	6.3		4.7	2.4	1.2	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	14		4.7	2.4	1.2	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.9	J	4.7	2.4	1.2	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	3.5	J	4.7	2.4	1.2	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.6	J	4.7	2.4	1.2	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.4	J	4.7	2.4	1.2	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	16		4.7	2.4	1.2	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	4.7	2.4	1.2	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.0	J	4.7	2.4	1.2	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	163	50-150	H	142	50-150
13C2_6:2FTS	H	111	50-150	N	184	50-150
13C2_8:2FTS		93	50-150	H	92	50-150
13C2_PFDoA		85	50-150	H	86	50-150
13C2_PFTeDA		91	50-150	H	86	50-150
13C3_PFBS		92	50-150	H	96	50-150
13C3_PFHxS		96	50-150	H	89	50-150
13C3-HFPO-DA		114	50-150	H	96	50-150
13C4_PFBA		99	50-150	H	98	50-150
13C4_PFHpA		101	50-150	H	99	50-150
13C5_PFHxA		94	50-150	H	95	50-150
13C5_PFPeA		98	50-150	H	98	50-150
13C6_PFDA		91	50-150	H	86	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH13098-010
Description: IDW-GW-10-08112021
Matrix: Aqueous
Date Sampled: 08/11/2021 1300
Project Name: NASA Ames PFAS
Date Received: 08/13/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		89	50-150	H	94	50-150
13C8_PFOA		99	50-150	H	99	50-150
13C8_PFOS		90	50-150	H	82	50-150
13C8_PFOSA		97	50-150	H	81	50-150
13C9_PFNA		91	50-150	H	95	50-150
d5-EtFOSAA		87	50-150	H	94	50-150
d3-MeFOSAA		93	50-150	H	93	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WH13098-011
Description: IDW-GW-11-08112021 | Matrix: Aqueous
Date Sampled: 08/11/2021 1320 | Project Name: NASA Ames PFAS
Date Received: 08/13/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/08/2021 1147	MMM	09/05/2021 1446	14518

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	69	B	8.4	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	UQ	8.4	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	20		4.2	2.1	1.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	4.2		4.2	2.1	1.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	20		4.2	2.1	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	180		4.2	2.1	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	74		4.2	2.1	1.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	54		4.2	2.1	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	160		4.2	2.1	1.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.2	J	4.2	2.1	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	19		4.2	2.1	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190		4.2	2.1	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	140		4.2	2.1	1.1	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	217	50-150
13C2_6:2FTS		116	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		101	50-150
13C3-HFPO-DA		109	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		108	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		90	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WH13098-011
Description: IDW-GW-11-08112021			Matrix: Aqueous
Date Sampled: 08/11/2021 1320		Project Name: NASA Ames PFAS	
Date Received: 08/13/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	50-150
13C8_PFOS		91	50-150
13C8_PFOSA		109	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH13098-012
Description: IDW-GW-12-08112021
Matrix: Aqueous
Date Sampled: 08/11/2021 1340
Project Name: NASA Ames PFAS
Date Received: 08/13/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/08/2021 1158	MMM	09/05/2021 1446	14518

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.8	BJ	8.0	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	UQ	8.0	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.6	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	5.9		4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.4	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.4		4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	15		4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	3.6	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	J	4.0	2.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	196	50-150
13C2_6:2FTS		116	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		82	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		102	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		108	50-150
13C5_PFPeA		97	50-150
13C6_PFDA		85	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH13098-012
Description: IDW-GW-12-08112021
Matrix: Aqueous
Date Sampled: 08/11/2021 1340
Project Name: NASA Ames PFAS
Date Received: 08/13/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		96	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		80	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ14296-001
Batch: 14296
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/02/2021 1801

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	09/03/2021 1407
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	09/03/2021 1407
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/03/2021 1407
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/03/2021 1407
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/03/2021 1407
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	09/03/2021 1407
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	09/03/2021 1407
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/03/2021 1407
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/03/2021 1407
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	09/03/2021 1407

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	50-150
13C2_6:2FTS		83	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		77	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		87	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ14296-001
Batch: 14296
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/02/2021 1801

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		78	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ14296-002
Batch: 14296
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/02/2021 1801

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	70-150	09/03/2021 1418
11Cl-PF3OUdS	15	13		1	88	70-150	09/03/2021 1418
8:2 FTS	15	15		1	100	67-138	09/03/2021 1418
6:2 FTS	15	16		1	108	64-140	09/03/2021 1418
4:2 FTS	15	13		1	87	63-143	09/03/2021 1418
GenX	32	31		1	96	70-150	09/03/2021 1418
ADONA	15	16		1	106	70-150	09/03/2021 1418
EtFOSAA	16	13		1	83	61-135	09/03/2021 1418
MeFOSAA	16	16		1	100	65-136	09/03/2021 1418
PFBS	14	14		1	102	72-130	09/03/2021 1418
PFDS	15	13		1	82	53-142	09/03/2021 1418
PFHpS	15	14		1	94	69-134	09/03/2021 1418
PFNS	15	14		1	92	69-127	09/03/2021 1418
PFOSA	16	14		1	86	67-137	09/03/2021 1418
PFPeS	15	15		1	98	71-127	09/03/2021 1418
PFHxS	15	16		1	108	68-131	09/03/2021 1418
PFBA	16	16		1	99	73-129	09/03/2021 1418
PFDA	16	15		1	96	71-129	09/03/2021 1418
PFDoA	16	16		1	100	72-134	09/03/2021 1418
PFHpA	16	16		1	97	72-130	09/03/2021 1418
PFHxA	16	15		1	92	72-129	09/03/2021 1418
PFNA	16	16		1	103	69-130	09/03/2021 1418
PFOA	16	16		1	98	71-133	09/03/2021 1418
PFPeA	16	16		1	97	72-129	09/03/2021 1418
PFTeDA	16	15		1	91	71-132	09/03/2021 1418
PFTrDA	16	13		1	84	65-144	09/03/2021 1418
PFUdA	16	16		1	101	69-133	09/03/2021 1418
PFOS	15	14		1	96	65-140	09/03/2021 1418

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS	N	191	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA	N	47	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		93	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ14296-002
Batch: 14296
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/02/2021 1801

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		81	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		89	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ14518-001
Batch: 14518
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/05/2021 1446

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	09/08/2021 1023
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	09/08/2021 1023
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/08/2021 1023
6:2 FTS	5.7	J	1	8.0	4.0	2.0	ng/L	09/08/2021 1023
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/08/2021 1023
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	09/08/2021 1023
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	09/08/2021 1023
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/08/2021 1023
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/08/2021 1023
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	09/08/2021 1023

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		94	50-150
13C2_6:2FTS		79	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		67	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		85	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ14518-001
Batch: 14518
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/05/2021 1446

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		80	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		86	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ14518-002
Batch: 14518
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/05/2021 1446

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	99	70-150	09/08/2021 1033
11Cl-PF3OUdS	15	15		1	102	70-150	09/08/2021 1033
8:2 FTS	15	14		1	90	67-138	09/08/2021 1033
6:2 FTS	15	21		1	140	64-140	09/08/2021 1033
4:2 FTS	15	16		1	108	63-143	09/08/2021 1033
GenX	32	32		1	99	70-150	09/08/2021 1033
ADONA	15	17		1	111	70-150	09/08/2021 1033
EtFOSAA	16	15		1	91	61-135	09/08/2021 1033
MeFOSAA	16	16		1	99	65-136	09/08/2021 1033
PFBS	14	16		1	110	72-130	09/08/2021 1033
PFDS	15	15		1	95	53-142	09/08/2021 1033
PFHpS	15	16		1	105	69-134	09/08/2021 1033
PFNS	15	17		1	109	69-127	09/08/2021 1033
PFOSA	16	16		1	101	67-137	09/08/2021 1033
PFPeS	15	16		1	108	71-127	09/08/2021 1033
PFHxS	15	13		1	88	68-131	09/08/2021 1033
PFBA	16	18		1	110	73-129	09/08/2021 1033
PFDA	16	16		1	102	71-129	09/08/2021 1033
PFDoA	16	16		1	100	72-134	09/08/2021 1033
PFHpA	16	19		1	118	72-130	09/08/2021 1033
PFHxA	16	17		1	104	72-129	09/08/2021 1033
PFNA	16	18		1	110	69-130	09/08/2021 1033
PFOA	16	16		1	97	71-133	09/08/2021 1033
PFPeA	16	16		1	101	72-129	09/08/2021 1033
PFTeDA	16	17		1	109	71-132	09/08/2021 1033
PFTrDA	16	15		1	96	65-144	09/08/2021 1033
PFUdA	16	18		1	111	69-133	09/08/2021 1033
PFOS	15	16		1	106	65-140	09/08/2021 1033

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	50-150
13C2_6:2FTS		69	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		74	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ14518-002
Batch: 14518
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/05/2021 1446

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		78	50-150
13C7_PFUdA		79	50-150
13C8_PFOA		83	50-150
13C8_PFOS		77	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		72	50-150
d5-EtFOSAA		80	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ14781-001
Batch: 14781
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/08/2021 1730

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/09/2021 1411

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		96	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		95	50-150
13C6_PFDA		93	50-150
13C7_PFUdA		80	50-150
13C8_PFOA		79	50-150
13C8_PFOS		95	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		91	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		102	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ14781-002
Batch: 14781
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/08/2021 1730

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
8:2 FTS	15	14		1	93	67-138	09/09/2021 1422

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		91	50-150
13C2_6:2FTS		89	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		85	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		79	50-150
13C8_PFOA		80	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ15321-001
Batch: 15321
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/14/2021 1619

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/15/2021 1935

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		91	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		86	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		86	50-150
13C8_PFOS		68	50-150
13C8_PFOSA		73	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ15321-002
Batch: 15321
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/14/2021 1619

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
6:2 FTS	15	14		1	92	64-140	09/15/2021 1946

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		91	50-150
13C2_6:2FTS		102	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		81	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		81	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		73	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 124292

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: mike.dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 2
City: Oakland State: CA Zip Code: 94612	Printed Name: Callie Neaves		
Project Name: NASA Ames PFAS			WH13098
Project No.: 103IG667601	P.O. No.		KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 (2)	RAC Filtered	PFAS	Dioxins	Remarks / Cooler I.D.
IDW-GW-01-08112021	8/11/21	1000	G	X			4							X	X	
IDW-GW-02-08112021	↓	1020	↓	X			↓							↓	↓	
IDW-GW-03-08112021	↓	1040	↓	X			↓							↓	↓	
IDW-GW-04-08112021	↓	1100	↓	X			↓							↓	↓	
IDW-GW-05-08112021	↓	1120	↓	X			↓							↓	↓	
IDW-GW-06-08112021	↓	1140	↓	X			↓							↓	↓	
IDW-GW-07-08112021	↓	1200	↓	X			↓							↓	↓	
IDW-GW-08-08112021	↓	1220	↓	X			↓							↓	↓	
IDW-GW-09-08112021	↓	1240	↓	X			↓							↓	↓	
IDW-GW-10-08112021	↓	1300	↓	X			↓							↓	↓	

Turn Around Time Required (Prior lab approval required for expedited TAT.)	Sample Disposal	Possible Hazard Identification	QC Requirements (Specify)
☐ Standard ☐ Rush (Specify)	☐ Return to Client ☐ Disposal by Lab	☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	8/12/21	1100	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: fedex	8-13-21	1012	4. Laboratory received by: Kayleen [signature]	8-13-21	1012

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 14.5/15.3 °C 14.9
Temp Blank ☐ Y ☑ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 124293

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 2 of 2
City: Oakland State: CA Zip Code: 94612	Printed Name: Callie Neaves		WH13098
Project Name: NASA Ames PFAS			KES2
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	NaOH/ZnAc	Other Filtered	PFAS	Dioxin	Remarks / Cooler I.D.
IDW-GW-11-08112021		1320	G	X			4							X	X	
IDW-GW-12-08112021		1340	G	X			4							X	X	
121 ~~IDW-GW-13-08112021~~		~~1400~~														

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)	Sample Disposal ☐ Return to Client ☐ Disposal by Lab	Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tetra Tech [signature]	8/12/21	1100	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: fedex	8-13-21	1012	4. Laboratory received by: Kayvon Evans	8-13-21	1012

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 14.5/15.3 °C 14.9
Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech

Cooler inspected by/date: KDRW / 08/13/2021 Lot #: W1113098

Means of receipt:	☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:		
☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

14.5 / 14.5 °C 15.3 / 15.3 °C 14.9 / 14.9 °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone (email) face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: KDRW Date: 08/13/2021

Comments:

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Kathy Smith
Shealy Environmental
106 Vantage Point Drive
West Columbia SC 29172

REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

Report Information:

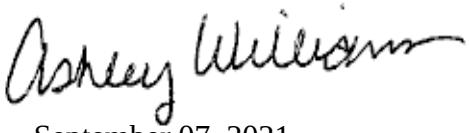
Pace Project #: 10574959
Sample Receipt Date: 08/17/2021
Client Project #: WH13098 Tetra Tech
Client Sub PO #: WH13098
State Cert #: 2929

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Ashley Williams, your Pace Project Manager.

This report has been reviewed by:



September 07, 2021

Ashley Williams, Project Manager
(612) 346-8158
(612) 607-6444 (fax)
ashley.williams@pacelabs.com

Report Prepared Date:
September 7, 2021

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analyses performed on twelve samples submitted by a representative of Shealy Environmental. The samples were analyzed for the presence or absence of of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using DoD QSM 5.3 (modified USEPA 8290A). The estimated detection limits were based on signal-to-noise measurements. Auto integration was used where accurate; manual integration was performed where auto integration was judged to be inaccurate.

The recoveries of the isotopically-labeled TCDD internal standards in the sample extracts ranged from 69-105%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290A. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained. Non-detected analytes were flagged "U".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected.

Laboratory and matrix spike samples were also prepared using clean reference matrix or sample matrix that had been fortified with native standard materials. The results show that the spiked native TCDD was recovered at 90-91% with a relative percent difference of 1.1%. These results were within the target range for DoD QSM 5.3. Matrix spikes were not prepared with the sample batch.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Missouri	10100
A2LA	2926.01	Montana	CERT0092
Alabama	40770	Nebraska	NE-OS-18-06
Alaska-DW	MN00064	Nevada	MN00064
Alaska-UST	17-009	New Hampshire	2081
Arizona	AZ0014	New Jersey	MN002
Arkansas - WW	88-0680	New York	11647
Arkansas-DW	MN00064	North Carolina-	27700
California	2929	North Carolina-	530
Colorado	MN00064	North Dakota	R-036
Connecticut	PH-0256	Ohio-DW	41244
Florida	E87605	Ohio-VAP (170	CL101
Georgia	959	Ohio-VAP (180	CL110
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Michigan	9909	West Virginia-D	382
Minnesota	027-053-137	West Virginia-D	9952C
Minnesota-Ag	via MN 027-053	Wisconsin	999407970
Minnesota-Petr	1240	Wyoming-UST	via A2LA 2926.
Mississippi	MN00064		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix A

Sample Management

Chain of Custody

Pace Analytical®
www.pacelabs.com

Workorder: WH13098 Workorder Name: NASA AMES Owner Received Date: 8/13/2021 Results Requested By: 9/10/2021

Report To:	Subcontract To:	Requested Analysis
Kathy E. Smith Pace Analytical 106 Vantage Point Drive Columbia SC, 29223 803-227-2704 Kathy.Smith@pacelabs.com	Pace 1700 Elm St. SE Suite 200 Minneapolis, MN 55414	WO#: 10574959 10574959

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: none	8290 DOD - 2,3,7,8-TCDD	LAB USE ONLY
1	IDW-GW-01-08112021	grab	08/11/2021 @ 1000	WH13098-001	Aqueous	x	x	001
2	IDW-GW-02-08112021	grab	08/11/2021 @ 1020	WH13098-002	Aqueous	x	x	002
3	IDW-GW-03-08112021	grab	08/11/2021 @ 1040	WH13098-003	Aqueous	x	x	003
4	IDW-GW-04-08112021	grab	08/11/2021 @ 1100	WH13098-004	Aqueous	x	x	004
5	IDW-GW-05-08112021	grab	08/11/2021 @ 1120	WH13098-005	Aqueous	x	x	005
6	IDW-GW-06-08112021	grab	08/11/2021 @ 1140	WH13098-006	Aqueous	x	x	006
7	IDW-GW-07-08112021	grab	08/11/2021 @ 1200	WH13098-007	Aqueous	x	x	007
8	IDW-GW-08-08112021	grab	08/11/2021 @ 1220	WH13098-008	Aqueous	x	x	008
9	IDW-GW-09-08112021	grab	08/11/2021 @ 1240	WH13098-009	Aqueous	x	x	009
10	IDW-GW-10-08112021	grab	08/11/2021 @ 1300	WH13098-010	Aqueous	x	x	010

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1	Jacque Shue	8/10/21 1900	[illegible]	8/13/21 1300	
2					
3					

Cooler Temperature on Receipt 1.4 °C	Custody Seal Y or N	Received on Ice Y or N	Sample Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: WH13098 Workorder Name: NASA AMES Owner Received Date: 8/13/2021 Results Requested By: 9/10/2021

Report To:	Subcontract To:
Kathy E. Smith Pace Analytical 106 Vantage Point Drive Columbia SC, 29223 803-227-2704 Kathy.Smith@pacelabs.com	Pace 1700 Elm St. SE Suite 200 Minneapolis, MN 55414

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: none	Requested Analysis: 8290 DOD - 2,3,7,8-TCDD	LAB USE ONLY
1	IDW-GW-11-08112021	grab	08/11/2021 @ 1320	WH13098-011	Aqueous	x	x	011
2	IDW-GW-12-08112021	grab	08/11/2021 @ 1340	WH13098-012	Aqueous	x	x	012
3								
4								
5								
6								
7								
8								
9								
10								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			IJ-PACE	8/12/21 1300	
2					
3					

Cooler Temperature on Receipt 1.1 °C	Custody Seal (Y) or N	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Report No....10574959_8290TCDD_DFR

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Pace-SC

Project #:

WO#: 10574959

PM: AW1 **Due Date: 09/08/21**

CLIENT: Shealy Env

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: 1663 3465 8141 See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☒ Yes ☐ No **Seals Intact?** ☒ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☒ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☐ T3(0459) ☐ OS418-LS ☐ T4(0254) ☒ T5(0489) ☐ 160285052 **Type of Ice:** ☐ Wet ☐ Blue ☐ None ☐ Dry ☒ Melted

Did Samples Originate in West Virginia? ☐ Yes ☒ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 1.3 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 1.4 °C

USDA Regulated Soil: (☒ N/A, water sample/Other: _____) **Date/Initials of Person Examining Contents:** 8/18/21 LJ

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒ Yes	☐ No		1.
Chain of Custody Relinquished?	☒ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☒ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other
Rush Turn Around Time Requested?	☐ Yes	☒ No		6.
Sufficient Volume?	☒ Yes	☐ No		7.
Correct Containers Used?	☒ Yes	☐ No		8.
-Pace Containers Used?	☒ Yes	☐ No		
Containers Intact?	☒ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☒ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
Matrix: ☒ Water ☐ Soil ☐ Oil ☐ Other				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☒ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☒ N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐ Yes	☐ No	☒ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☒ N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☒ N/A	
Trip Blank Present?	☐ Yes	☐ No	☒ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	Pace Trip Blank Lot # (if purchased):

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Ashley Williams **Date:** 8/18/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-01-08112021		
Lab Sample ID	10574959001		
Filename	U210826B_02		
Injected By	SMT		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 10:00
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/26/2021 21:16

Native Isomers	RT	Ratio	Conc pg/L		EMPC pg/L	LOQ pg/L	LOD pg/L	EDL pg/L
2,3,7,8-TCDD	---	---	4.0	U	----	9.9	4.0	1.5

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-01-08112021		
Lab Sample ID	10574959001		
Filename	U210826B_02		
Injected By	SMT		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 10:00
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/26/2021 21:16

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.95	0.80	1600	2.00	1.60	80
Recovery Standard 1,2,3,4-TCDD-13C	22.96	0.79	NA	2.00	NA	NA
Cleanup Standard 2,3,7,8-TCDD-37Cl4	24.00	0.00	160	0.20	0.17	83

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-02-08112021		
Lab Sample ID	10574959002		
Filename	U210826B_03		
Injected By	SMT		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 10:20
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/26/2021 22:01

Native Isomers	RT	Ratio	Conc pg/L		EMPC pg/L	LOQ pg/L	LOD pg/L	EDL pg/L
2,3,7,8-TCDD	---	---	3.9	U	----	9.7	3.9	1.6

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-02-08112021		
Lab Sample ID	10574959002		
Filename	U210826B_03		
Injected By	SMT		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 10:20
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/26/2021 22:01

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.95	0.80	1600	2.00	1.63	81
Recovery Standard						
1,2,3,4-TCDD-13C	22.96	0.78	NA	2.00	NA	NA
Cleanup Standard						
2,3,7,8-TCDD-37Cl4	23.99	0.00	170	0.20	0.17	87

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-03-08112021		
Lab Sample ID	10574959003		
Filename	U210826B_04		
Injected By	SMT		
Total Amount Extracted	1020 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 10:40
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/26/2021 22:47

Native Isomers	RT	Ratio	Conc pg/L		EMPC pg/L	LOQ pg/L	LOD pg/L	EDL pg/L
2,3,7,8-TCDD	---	---	3.9	U	----	9.8	3.9	1.3

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-03-08112021		
Lab Sample ID	10574959003		
Filename	U210826B_04		
Injected By	SMT		
Total Amount Extracted	1020 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 10:40
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/26/2021 22:47

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.95	0.80	1800	2.00	1.86	93
Recovery Standard						
1,2,3,4-TCDD-13C	22.96	0.79	NA	2.00	NA	NA
Cleanup Standard						
2,3,7,8-TCDD-37Cl4	24.00	0.00	170	0.20	0.18	88

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-04-08112021		
Lab Sample ID	10574959004		
Filename	U210826B_05		
Injected By	SMT		
Total Amount Extracted	891 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 11:00
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/26/2021 23:32

Native Isomers	RT	Ratio	Conc pg/L		EMPC pg/L	LOQ pg/L	LOD pg/L	EDL pg/L
2,3,7,8-TCDD	---	---	4.5	U	----	11	4.5	2.4

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-04-08112021		
Lab Sample ID	10574959004		
Filename	U210826B_05		
Injected By	SMT		
Total Amount Extracted	891 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 11:00
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/26/2021 23:32

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.97	0.79	2200	2.00	2.00	100
Recovery Standard 1,2,3,4-TCDD-13C	22.96	0.79	NA	2.00	NA	NA
Cleanup Standard 2,3,7,8-TCDD-37Cl4	24.00	0.00	230	0.20	0.20	102

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-05-08112021		
Lab Sample ID	10574959005		
Filename	U210826B_06		
Injected By	SMT		
Total Amount Extracted	876 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 11:20
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 00:17

Native Isomers	RT	Ratio	Conc pg/L		EMPC pg/L	LOQ pg/L	LOD pg/L	EDL pg/L
2,3,7,8-TCDD	---	---	4.6	U	----	11	4.6	1.3

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-05-08112021		
Lab Sample ID	10574959005		
Filename	U210826B_06		
Injected By	SMT		
Total Amount Extracted	876 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 11:20
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 00:17

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.95	0.81	2400	2.00	2.09	105
Recovery Standard						
1,2,3,4-TCDD-13C	22.96	0.79	NA	2.00	NA	NA
Cleanup Standard						
2,3,7,8-TCDD-37Cl4	24.00	0.00	220	0.20	0.19	97

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-06-08112021		
Lab Sample ID	10574959006		
Filename	U210826B_07		
Injected By	SMT		
Total Amount Extracted	950 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 11:40
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 01:02

Native Isomers	RT	Ratio	Conc pg/L		EMPC pg/L	LOQ pg/L	LOD pg/L	EDL pg/L
2,3,7,8-TCDD	---	---	4.2	U	----	11	4.2	1.1

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-06-08112021		
Lab Sample ID	10574959006		
Filename	U210826B_07		
Injected By	SMT		
Total Amount Extracted	950 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 11:40
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 01:02

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.95	0.79	2200	2.00	2.07	104
Recovery Standard 1,2,3,4-TCDD-13C	22.96	0.78	NA	2.00	NA	NA
Cleanup Standard 2,3,7,8-TCDD-37Cl4	23.99	0.00	190	0.20	0.18	91

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-07-08112021		
Lab Sample ID	10574959007		
Filename	U210826B_08		
Injected By	SMT		
Total Amount Extracted	862 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 12:00
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 01:47

Native Isomers	RT	Ratio	Conc pg/L		EMPC pg/L	LOQ pg/L	LOD pg/L	EDL pg/L
2,3,7,8-TCDD	---	---	4.6	U	----	12	4.6	2.2

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-07-08112021		
Lab Sample ID	10574959007		
Filename	U210826B_08		
Injected By	SMT		
Total Amount Extracted	862 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 12:00
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 01:47

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.95	0.80	2100	2.00	1.79	90
Recovery Standard 1,2,3,4-TCDD-13C	22.96	0.80	NA	2.00	NA	NA
Cleanup Standard 2,3,7,8-TCDD-37Cl4	23.99	0.00	220	0.20	0.19	94

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-08-08112021		
Lab Sample ID	10574959008		
Filename	U210826B_09		
Injected By	SMT		
Total Amount Extracted	800 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 12:20
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 02:33

Native Isomers	**RT**	**Ratio**	**Conc** pg/L		**EMPC** pg/L	**LOQ** pg/L	**LOD** pg/L	**EDL** pg/L
2,3,7,8-TCDD	---	---	5.0	U	----	13	5.0	1.6

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-08-08112021		
Lab Sample ID	10574959008		
Filename	U210826B_09		
Injected By	SMT		
Total Amount Extracted	800 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 12:20
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 02:33

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.95	0.79	1700	2.00	1.38	69
Recovery Standard						
1,2,3,4-TCDD-13C	22.98	0.79	NA	2.00	NA	NA
Cleanup Standard						
2,3,7,8-TCDD-37Cl4	23.98	0.00	220	0.20	0.17	87

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-09-08112021		
Lab Sample ID	10574959009		
Filename	U210826B_10		
Injected By	SMT		
Total Amount Extracted	762 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 12:40
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 03:18

Native Isomers	**RT**	**Ratio**	**Conc** pg/L		**EMPC** pg/L	**LOQ** pg/L	**LOD** pg/L	**EDL** pg/L
2,3,7,8-TCDD	---	---	5.3	U	----	13	5.3	2.2

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-09-08112021		
Lab Sample ID	10574959009		
Filename	U210826B_10		
Injected By	SMT		
Total Amount Extracted	762 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 12:40
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 03:18

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.95	0.78	2000	2.00	1.52	76
Recovery Standard						
1,2,3,4-TCDD-13C	22.96	0.78	NA	2.00	NA	NA
Cleanup Standard						
2,3,7,8-TCDD-37Cl4	23.97	0.00	240	0.20	0.18	90

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-10-08112021		
Lab Sample ID	10574959010		
Filename	U210826B_11		
Injected By	SMT		
Total Amount Extracted	899 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 13:00
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 04:03

Native Isomers	**RT**	**Ratio**	**Conc** pg/L		**EMPC** pg/L	**LOQ** pg/L	**LOD** pg/L	**EDL** pg/L
2,3,7,8-TCDD	---	---	4.4	U	----	11	4.4	1.2

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-10-08112021		
Lab Sample ID	10574959010		
Filename	U210826B_11		
Injected By	SMT		
Total Amount Extracted	899 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 13:00
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 04:03

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.95	0.76	2300	2.00	2.03	102
Recovery Standard						
1,2,3,4-TCDD-13C	22.94	0.79	NA	2.00	NA	NA
Cleanup Standard						
2,3,7,8-TCDD-37Cl4	23.97	0.00	210	0.20	0.19	96

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-11-08112021		
Lab Sample ID	10574959011		
Filename	U210826B_12		
Injected By	SMT		
Total Amount Extracted	845 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 13:20
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 04:48

Native Isomers	RT	Ratio	Conc pg/L		EMPC pg/L	LOQ pg/L	LOD pg/L	EDL pg/L
2,3,7,8-TCDD	---	---	4.7	U	----	12	4.7	0.85

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-11-08112021		
Lab Sample ID	10574959011		
Filename	U210826B_12		
Injected By	SMT		
Total Amount Extracted	845 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 13:20
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 04:48

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.94	0.79	2200	2.00	1.88	94
Recovery Standard						
1,2,3,4-TCDD-13C	22.94	0.80	NA	2.00	NA	NA
Cleanup Standard						
2,3,7,8-TCDD-37Cl4	23.99	0.00	210	0.20	0.17	87

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Native Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-12-08112021		
Lab Sample ID	10574959012		
Filename	U210826B_13		
Injected By	SMT		
Total Amount Extracted	781 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 13:40
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 05:33

Native Isomers	RT	Ratio	Conc pg/L		EMPC pg/L	LOQ pg/L	LOD pg/L	EDL pg/L
2,3,7,8-TCDD	---	---	5.1	U	----	13	5.1	2.3

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Labeled Analytes

Client	Shealy Environmental		
Client's Sample ID	IDW-GW-12-08112021		
Lab Sample ID	10574959012		
Filename	U210826B_13		
Injected By	SMT		
Total Amount Extracted	781 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	08/11/2021 13:40
ICAL ID	U210629	Received	08/17/2021 13:00
CCal Filename(s)	U210826A_15 & U210826B_14	Extracted	08/24/2021 10:30
Method Blank ID	BLANK-92555	Analyzed	08/27/2021 05:33

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	23.97	0.78	2100	2.00	1.65	83
Recovery Standard						
1,2,3,4-TCDD-13C	22.98	0.79	NA	2.00	NA	NA
Cleanup Standard						
2,3,7,8-TCDD-37Cl4	23.99	0.00	240	0.20	0.18	92

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

R = Recovery outside target range
E = Exceeds calibration range
Y = Calculated using average of daily RFs

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Blank Analysis Results

Native Analytes

Lab Sample ID	BLANK-92555		
Filename	F210826A_08		
Injected By	SMT		
Total Amount Extracted	990 mL	Matrix	Water
Dry Weight Extracted	NA	Dilution	NA
ICAL ID	F210611	Extracted	08/24/2021 10:30
CCal Filename(s)	F210826A_01 & F210826A_18	Analyzed	08/26/2021 14:25

Native Isomers	RT	Ratio	Conc pg/L		EMPC pg/L	LOQ pg/L	LOD pg/L	EDL pg/L
2,3,7,8-TCDD	---	---	4.0	U	----	10	4.0	0.89

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Blank Analysis Results

Labeled Analytes

Lab Sample ID	BLANK-92555		
Filename	F210826A_08		
Injected By	SMT		
Total Amount Extracted	990 mL	Matrix	Water
Dry Weight Extracted	NA	Dilution	NA
ICAL ID	F210611	Extracted	08/24/2021 10:30
CCal Filename(s)	F210826A_01 & F210826A_18	Analyzed	08/26/2021 14:25

Labeled Isomers	RT	Ratio	Conc pg/L	ng's Added	ng's Found	% Recovery
2,3,7,8-TCDD-13C	20.81	0.77	1800	2.00	1.76	88
Recovery Standard 1,2,3,4-TCDD-13C	19.93	0.79	NA	2.00	NA	NA
Cleanup Standard 2,3,7,8-TCDD-37Cl4	20.83	0.00	220	0.20	0.21	107

RT = Peak Retention Time in minutes
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration

LOQ = Limit of Quantitation
LOD = Limit of Detection
EDL = Estimated Detection Limit

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCS-92556		
Filename	U210827A_03	Matrix	Water
Total Amount Extracted	930 mL	Dilution	NA
ICAL ID	U210629	Extracted	08/24/2021 10:30
CCal Filename(s)	U210827A_02 & U210827A_18	Analyzed	08/27/2021 10:26
Method Blank ID	BLANK-92555	Injected By	JRH

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	0.20	0.18	90			
				2,3,7,8-TCDD-13C	2.0	84
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	89

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCSD-92557		
Filename	F210826A_05	Matrix	Water
Total Amount Extracted	960 mL	Dilution	NA
ICAL ID	F210611	Extracted	08/24/2021 10:30
CCal Filename(s)	F210826A_01 & F210826A_18	Analyzed	08/26/2021 12:11
Method Blank ID	BLANK-92555	Injected By	SMT

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	0.20	0.18	91			
				2,3,7,8-TCDD-13C	2.0	93
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	99

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A

Spike Recovery Relative Percent Difference (RPD) Results

Client	Shealy Environmental		
Spike 1 ID	LCS-92556	Spike 2 ID	LCSD-92557
Spike 1 Filename	U210827A_03	Spike 2 Filename	F210826A_05

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	90	91	1.1

%REC = Percent Recovered
RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dahlquist

Project Name: NASA Ames PFAS

Project Number: 103IG667601

Lot Number:**WH19014**

Date Completed:09/29/2021

09/30/2021 11:06 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Case Narrative
Tetra Tech
Lot Number: WH19014

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation:

Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, Fecal Coliform SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, Solid Chemical Material: TOC Walkley-Black.

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

The continuing calibration verification (CCV) associated with samples WH19014-001, WH19014-002 was outside of criteria for the following analytes: 4:2 and 6:2FTS surrogates/EIS recovered high. Associated target analytes recovered within limits The data has been reported.

Surrogate recovery for the following sample was outside the upper control limit: WH19014-001. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: WH19014-002. Re-extraction and/or re-analysis was performed with concurring results outside of holding time. Both sets of data have been reported.

The method blank associated with batch 15107 had PFOS detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for PFOS have been flagged with a "B".

Sample Summary

Tetra Tech

Lot Number: WH19014

Project Name: NASA Ames PFAS

Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC14-SW01-EF-081821	Aqueous	08/18/2021 1330	08/19/2021
002	AOPC14-SW01-IN-081821	Aqueous	08/18/2021 1340	08/19/2021

(2 samples)

Detection Summary

Tetra Tech

Lot Number: WH19014

Project Name: NASA Ames PFAS

Project Number: 103IG667601

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	AOPC14-SW01-EF-081821	Aqueous	PFBS	PFAS by ID	24		ng/L	6
001	AOPC14-SW01-EF-081821	Aqueous	PFHpS	PFAS by ID	4.9		ng/L	6
001	AOPC14-SW01-EF-081821	Aqueous	PFPeS	PFAS by ID	20		ng/L	6
001	AOPC14-SW01-EF-081821	Aqueous	PFHxS	PFAS by ID	100		ng/L	6
001	AOPC14-SW01-EF-081821	Aqueous	PFBA	PFAS by ID	10		ng/L	6
001	AOPC14-SW01-EF-081821	Aqueous	PFHpA	PFAS by ID	4.5		ng/L	6
001	AOPC14-SW01-EF-081821	Aqueous	PFHxA	PFAS by ID	22		ng/L	6
001	AOPC14-SW01-EF-081821	Aqueous	PFOA	PFAS by ID	13		ng/L	6
001	AOPC14-SW01-EF-081821	Aqueous	PFPeA	PFAS by ID	9.6		ng/L	6
001	AOPC14-SW01-EF-081821	Aqueous	PFOS	PFAS by ID	94	B	ng/L	6
002	AOPC14-SW01-IN-081821	Aqueous	6:2 FTS	PFAS by ID	2.7	JQ	ng/L	8
002	AOPC14-SW01-IN-081821	Aqueous	PFBS	PFAS by ID	26		ng/L	8
002	AOPC14-SW01-IN-081821	Aqueous	PFHpS	PFAS by ID	6.5		ng/L	8
002	AOPC14-SW01-IN-081821	Aqueous	PFPeS	PFAS by ID	21		ng/L	8
002	AOPC14-SW01-IN-081821	Aqueous	PFHxS	PFAS by ID	130		ng/L	8
002	AOPC14-SW01-IN-081821	Aqueous	PFBA	PFAS by ID	8.2		ng/L	8
002	AOPC14-SW01-IN-081821	Aqueous	PFHpA	PFAS by ID	5.7		ng/L	8
002	AOPC14-SW01-IN-081821	Aqueous	PFHxA	PFAS by ID	27		ng/L	8
002	AOPC14-SW01-IN-081821	Aqueous	PFOA	PFAS by ID	14		ng/L	8
002	AOPC14-SW01-IN-081821	Aqueous	PFPeA	PFAS by ID	8.8		ng/L	8
002	AOPC14-SW01-IN-081821	Aqueous	PFOS	PFAS by ID	120	B	ng/L	8

(21 detections)

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WH19014-001
Description: AOPC14-SW01-EF-081821 | Matrix: Aqueous
Date Sampled: 08/18/2021 1330 | Project Name: NASA Ames PFAS
Date Received: 08/19/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/15/2021 1914	MMM	09/12/2021 1358	15107

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.1	UQ	8.2	4.1	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	24		4.1	2.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	4.9		4.1	2.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	20		4.1	2.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	100		4.1	2.1	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	10		4.1	2.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	4.5		4.1	2.1	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	22		4.1	2.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	13		4.1	2.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	9.6		4.1	2.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	94	B	4.1	2.1	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		132	50-150
13C2_6:2FTS	N	240	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		103	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		115	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		92	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH19014-001
Description: AOPC14-SW01-EF-081821
Matrix: Aqueous
Date Sampled: 08/18/2021 1330
Project Name: NASA Ames PFAS
Date Received: 08/19/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		105	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WH19014-002
Description: AOPC14-SW01-IN-081821 | Matrix: Aqueous
Date Sampled: 08/18/2021 1340 | Project Name: NASA Ames PFAS
Date Received: 08/19/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/15/2021 1924	MMM	09/12/2021 1358	15107
2	SOP SPE	PFAS by ID SOP QSM B-15	1	09/19/2021 1754	JJG	09/17/2021 1758	15718

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.7	JQ	7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	26		4.0	2.0	0.99	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	6.5		4.0	2.0	0.99	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	21		4.0	2.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	130		4.0	2.0	0.99	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	8.2		4.0	2.0	0.99	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	5.7		4.0	2.0	0.99	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	27		4.0	2.0	0.99	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	14		4.0	2.0	0.99	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	8.8		4.0	2.0	0.99	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	120	B	4.0	2.0	0.99	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		115	50-150	H	115	50-150
13C2_6:2FTS	N	271	50-150	HN	155	50-150
13C2_8:2FTS		105	50-150	H	101	50-150
13C2_PFDoA		92	50-150	H	97	50-150
13C2_PFTeDA		106	50-150	H	101	50-150
13C3_PFBS		110	50-150	H	111	50-150
13C3_PFHxS		96	50-150	H	104	50-150
13C3-HFPO-DA		113	50-150	H	109	50-150
13C4_PFBA		106	50-150	H	110	50-150
13C4_PFHpA		108	50-150	H	107	50-150
13C5_PFHxA		96	50-150	H	110	50-150
13C5_PFPeA		107	50-150	H	107	50-150
13C6_PFDA		97	50-150	H	101	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH19014-002
Description: AOPC14-SW01-IN-081821
Matrix: Aqueous
Date Sampled: 08/18/2021 1340
Project Name: NASA Ames PFAS
Date Received: 08/19/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		97	50-150	H	115	50-150
13C8_PFOA		112	50-150	H	120	50-150
13C8_PFOS		89	50-150	H	97	50-150
13C8_PFOSA		92	50-150	H	112	50-150
13C9_PFNA		99	50-150	H	111	50-150
d5-EtFOSAA		106	50-150	H	110	50-150
d3-MeFOSAA		107	50-150	H	108	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WH19014-002
Description: AOPC14-SW01-IN-081821 | Matrix: Aqueous
Date Sampled: 08/18/2021 1340 | Project Name: NASA Ames PFAS
Date Received: 08/19/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/15/2021 1924	MMM	09/12/2021 1358	15107
2	SOP SPE	PFAS by ID SOP QSM B-15	1	09/19/2021 1754	JJG	09/17/2021 1758	15718

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.2	HJQ	8.3	4.2	2.1	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	28	H	4.1	2.1	1.0	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	8.0	H	4.1	2.1	1.0	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	24	H	4.1	2.1	1.0	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	140	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	8.0	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	6.0	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	27	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	16	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	10	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	120	H	4.1	2.1	1.0	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		115	50-150	H	115	50-150
13C2_6:2FTS	N	271	50-150	HN	155	50-150
13C2_8:2FTS		105	50-150	H	101	50-150
13C2_PFDoA		92	50-150	H	97	50-150
13C2_PFTeDA		106	50-150	H	101	50-150
13C3_PFBS		110	50-150	H	111	50-150
13C3_PFHxS		96	50-150	H	104	50-150
13C3-HFPO-DA		113	50-150	H	109	50-150
13C4_PFBA		106	50-150	H	110	50-150
13C4_PFHpA		108	50-150	H	107	50-150
13C5_PFHxA		96	50-150	H	110	50-150
13C5_PFPeA		107	50-150	H	107	50-150
13C6_PFDA		97	50-150	H	101	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH19014-002
Description: AOPC14-SW01-IN-081821
Matrix: Aqueous
Date Sampled: 08/18/2021 1340
Project Name: NASA Ames PFAS
Date Received: 08/19/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		97	50-150	H	115	50-150
13C8_PFOA		112	50-150	H	120	50-150
13C8_PFOS		89	50-150	H	97	50-150
13C8_PFOSA		92	50-150	H	112	50-150
13C9_PFNA		99	50-150	H	111	50-150
d5-EtFOSAA		106	50-150	H	110	50-150
d3-MeFOSAA		107	50-150	H	108	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ15107-001
Batch: 15107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/12/2021 1358

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFOS	1.5	J	1	4.0	2.0	1.0	ng/L	09/13/2021 2028

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		114	50-150
13C2_6:2FTS		120	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		102	50-150
13C3-HFPO-DA		113	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		110	50-150
13C5_PFPeA		111	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ15107-001
Batch: 15107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/12/2021 1358

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		108	50-150
13C8_PFOS		91	50-150
13C8_PFOSA		107	50-150
13C9_PFNA		104	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ15107-002
Batch: 15107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/12/2021 1358

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	70-150	09/13/2021 2039
11Cl-PF3OUdS	15	14		1	90	70-150	09/13/2021 2039
8:2 FTS	15	15		1	97	67-138	09/13/2021 2039
6:2 FTS	15	15		1	101	64-140	09/13/2021 2039
4:2 FTS	15	16		1	106	63-143	09/13/2021 2039
GenX	32	30		1	94	70-150	09/13/2021 2039
ADONA	15	16		1	105	70-150	09/13/2021 2039
EtFOSAA	16	15		1	92	61-135	09/13/2021 2039
MeFOSAA	16	15		1	92	65-136	09/13/2021 2039
PFBS	14	14		1	97	72-130	09/13/2021 2039
PFDS	15	14		1	93	53-142	09/13/2021 2039
PFHpS	15	15		1	100	69-134	09/13/2021 2039
PFNS	15	16		1	102	69-127	09/13/2021 2039
PFOSA	16	13		1	82	67-137	09/13/2021 2039
PFPeS	15	17		1	114	71-127	09/13/2021 2039
PFHxS	15	14		1	99	68-131	09/13/2021 2039
PFBA	16	15		1	93	73-129	09/13/2021 2039
PFDA	16	17		1	106	71-129	09/13/2021 2039
PFDoA	16	15		1	95	72-134	09/13/2021 2039
PFHpA	16	17		1	105	72-130	09/13/2021 2039
PFHxA	16	14		1	87	72-129	09/13/2021 2039
PFNA	16	16		1	101	69-130	09/13/2021 2039
PFOA	16	15		1	94	71-133	09/13/2021 2039
PFPeA	16	16		1	99	72-129	09/13/2021 2039
PFTeDA	16	17		1	107	71-132	09/13/2021 2039
PFTrDA	16	16		1	102	65-144	09/13/2021 2039
PFUdA	16	16		1	99	69-133	09/13/2021 2039
PFOS	15	15		1	104	65-140	09/13/2021 2039

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		111	50-150
13C2_6:2FTS		118	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		95	50-150
13C2_PFTeDA		104	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		103	50-150
13C3-HFPO-DA		114	50-150
13C4_PFBA		107	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		116	50-150
13C5_PFPeA		110	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ15107-002
Batch: 15107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/12/2021 1358

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		99	50-150
13C7_PFUdA		106	50-150
13C8_PFOA		108	50-150
13C8_PFOS		101	50-150
13C8_PFOSA		118	50-150
13C9_PFNA		106	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ15718-001
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		107	50-150
13C2_6:2FTS		105	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		95	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		106	50-150
13C3-HFPO-DA		107	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		105	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ15718-001
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		98	50-150
13C7_PFUdA		113	50-150
13C8_PFOA		108	50-150
13C8_PFOS		105	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		112	50-150
d5-EtFOSAA		108	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ15718-002
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	91	70-150	09/19/2021 1711
11Cl-PF3OUdS	15	13		1	86	70-150	09/19/2021 1711
8:2 FTS	15	14		1	89	67-138	09/19/2021 1711
6:2 FTS	15	11		1	72	64-140	09/19/2021 1711
4:2 FTS	15	14		1	93	63-143	09/19/2021 1711
GenX	32	31		1	96	70-150	09/19/2021 1711
ADONA	15	15		1	97	70-150	09/19/2021 1711
EtFOSAA	16	15		1	92	61-135	09/19/2021 1711
MeFOSAA	16	16		1	103	65-136	09/19/2021 1711
PFBS	14	13		1	91	72-130	09/19/2021 1711
PFDS	15	14		1	92	53-142	09/19/2021 1711
PFHpS	15	14		1	92	69-134	09/19/2021 1711
PFNS	15	13		1	84	69-127	09/19/2021 1711
PFOSA	16	15		1	92	67-137	09/19/2021 1711
PFPeS	15	13		1	84	71-127	09/19/2021 1711
PFHxS	15	13		1	91	68-131	09/19/2021 1711
PFBA	16	15		1	94	73-129	09/19/2021 1711
PFDA	16	15		1	91	71-129	09/19/2021 1711
PFDoA	16	15		1	94	72-134	09/19/2021 1711
PFHpA	16	16		1	98	72-130	09/19/2021 1711
PFHxA	16	14		1	90	72-129	09/19/2021 1711
PFNA	16	15		1	93	69-130	09/19/2021 1711
PFOA	16	15		1	93	71-133	09/19/2021 1711
PFPeA	16	16		1	97	72-129	09/19/2021 1711
PFTeDA	16	16		1	99	71-132	09/19/2021 1711
PFTrDA	16	14		1	90	65-144	09/19/2021 1711
PFUdA	16	15		1	96	69-133	09/19/2021 1711
PFOS	15	14		1	93	65-140	09/19/2021 1711

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		120	50-150
13C2_6:2FTS		119	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		100	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		116	50-150
13C3-HFPO-DA		110	50-150
13C4_PFBA		113	50-150
13C4_PFHpA		109	50-150
13C5_PFHxA		117	50-150
13C5_PFPeA		110	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ15718-002
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		108	50-150
13C7_PFUdA		122	50-150
13C8_PFOA		113	50-150
13C8_PFOS		110	50-150
13C8_PFOSA		113	50-150
13C9_PFNA		122	50-150
d5-EtFOSAA		115	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCSD

Sample ID: WQ15718-003
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	4.2	70-150	30	09/19/2021 1722
11Cl-PF3OUdS	15	14		1	92	6.7	70-150	30	09/19/2021 1722
8:2 FTS	15	13		1	84	5.4	67-138	30	09/19/2021 1722
6:2 FTS	15	14		1	96	29	64-140	30	09/19/2021 1722
4:2 FTS	15	13		1	90	3.4	63-143	30	09/19/2021 1722
GenX	32	28		1	87	9.7	70-150	30	09/19/2021 1722
ADONA	15	15		1	99	1.7	70-150	30	09/19/2021 1722
EtFOSAA	16	15		1	95	3.0	61-135	30	09/19/2021 1722
MeFOSAA	16	14		1	89	14	65-136	30	09/19/2021 1722
PFBS	14	12		1	88	3.1	72-130	30	09/19/2021 1722
PFDS	15	12		1	80	14	53-142	30	09/19/2021 1722
PFHpS	15	15		1	95	3.4	69-134	30	09/19/2021 1722
PFNS	15	14		1	89	6.8	69-127	30	09/19/2021 1722
PFOSA	16	15		1	92	0.0061	67-137	30	09/19/2021 1722
PFPeS	15	14		1	91	7.2	71-127	30	09/19/2021 1722
PFHxS	15	14		1	97	6.2	68-131	30	09/19/2021 1722
PFBA	16	15		1	93	1.2	73-129	30	09/19/2021 1722
PFDA	16	15		1	96	5.1	71-129	30	09/19/2021 1722
PFDoA	16	16		1	98	4.1	72-134	30	09/19/2021 1722
PFHpA	16	15		1	92	6.4	72-130	30	09/19/2021 1722
PFHxA	16	16		1	101	11	72-129	30	09/19/2021 1722
PFNA	16	15		1	97	4.4	69-130	30	09/19/2021 1722
PFOA	16	15		1	92	0.46	71-133	30	09/19/2021 1722
PFPeA	16	15		1	94	3.4	72-129	30	09/19/2021 1722
PFTeDA	16	16		1	97	1.7	71-132	30	09/19/2021 1722
PFTrDA	16	15		1	94	4.2	65-144	30	09/19/2021 1722
PFUdA	16	15		1	94	2.1	69-133	30	09/19/2021 1722
PFOS	15	12		1	83	11	65-140	30	09/19/2021 1722

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		110	50-150
13C2_6:2FTS		113	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		101	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		110	50-150
13C4_PFBA		110	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		112	50-150
13C5_PFPeA		108	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCSD

Sample ID: WQ15718-003
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		106	50-150
13C7_PFUdA		118	50-150
13C8_PFOA		112	50-150
13C8_PFOS		106	50-150
13C8_PFOSA		108	50-150
13C9_PFNA		113	50-150
d5-EtFOSAA		108	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 124295

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510)302-6310/ Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves		WH19014
Project Name: NASA Ames PFAS			KES2
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	8-Grab Composite	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	HCl	HNO3	H2O	NaOH	Solid Kit	Field Filtered	PFAS (QSM 8-15)	Remarks / Cooler I.D.
AOPC14-SW01-EF-081821	8/18/21	1330	G	x			2							x	
AOPC14-SW01-IN-081821	8/18/21	1340	G	x			2							x	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	8/18/21	1430	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	8/19/21	0930	4. Laboratory received by: [signature]	8/19/21	0930

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on ice (Circle) Yes No Ice Pack Receipt Temp. 3.4 °C Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: JSH / 08/19/2021 Lot #: WH19614

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: ____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.4 / 3.4 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA ____ were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation: NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA ____ were received with bubbles >6 mm in diameter.

Samples(s) NA ____ were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JRG2 Date: 08/19/2021

Comments:

Report of Analysis

BB&E, Inc.
NASA Ames Research Center
Bldg T20-G, Room 128
Moffett Field, CA 94035--1000
Attention: Brian D. Reddig

Project Name: PFAS Outfall

Lot Number:**WK24009**

Date Completed:12/15/2021

12/15/2021 2:25 PM
Approved and released by:
Project Manager II: **Marcia K. McGinnity**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
BB&E, Inc.
Lot Number: WK24009

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs, the DoD QSM, or policies are qualified on the results page or discussed below.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation:

Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, Fecal Coliform SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, Solid Chemical Material: TOC Walkley-Black.

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

Sample Notes:

Sample matrix for the listed samples prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Recoveries for the Surrogates (SUR; Extracted Internal Standard/EIS) were outside control limits for the first listed sample. As evidence of matrix interference is present, re-extraction/re-analysis was not performed. Results for the first listed sample are qualified “Q”.
WK24009-002 (SWRP-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-004 (B1914-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)

The continuing calibration verification (CCV) associated with the listed samples exceeded limits with a positive bias for the 6:2 FTS surrogate (SUR; Extracted Internal Standard/EIS). The associated target analyte passed; therefore, the data has been reported.
WK24009-001 (SBOF-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-002 (SWRP-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-003 (SCOF-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive

List PFAS by Isotope Dilution (DOD)
WK24009-004 (B1914-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)

6:2 FTS surrogate (SUR; Extracted Internal Standard/EIS) recovery for the method blank (MB) associated with the listed samples exceeded the upper control limit. The MB did not contain the associated target analyte; therefore, re-extraction/re-analysis was not performed.
WK24009-001 (SBOF-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-002 (SWRP-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-003 (SCOF-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-004 (B1914-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

Cs is on column concentration of target analyte in the sample (ng/L)
Cis is concentration of internal standard in the sample (ng/L)
As is peak response of target analyte in the sample
Ais is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Sample Summary

BB&E, Inc.

Lot Number: WK24009

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	SBOF-P-111221	Aqueous	11/12/2021 1110	11/17/2021
002	SWRP-P-111221	Aqueous	11/12/2021 1120	11/17/2021
003	SCOF-P-111221	Aqueous	11/12/2021 1130	11/17/2021
004	B1914-P-111221	Aqueous	11/12/2021 1440	11/17/2021

(4 samples)

Detection Summary

BB&E, Inc.

Lot Number: WK24009

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	SBOF-P-111221	Aqueous	PFBS	PFAS by ID	4.0		ng/L	6
001	SBOF-P-111221	Aqueous	PFPeS	PFAS by ID	1.2	J	ng/L	6
001	SBOF-P-111221	Aqueous	PFHxS	PFAS by ID	6.0		ng/L	6
001	SBOF-P-111221	Aqueous	PFBA	PFAS by ID	2.9	J	ng/L	6
001	SBOF-P-111221	Aqueous	PFHxA	PFAS by ID	1.5	J	ng/L	6
001	SBOF-P-111221	Aqueous	PFOA	PFAS by ID	1.1	J	ng/L	6
001	SBOF-P-111221	Aqueous	PFPeA	PFAS by ID	1.7	J	ng/L	6
001	SBOF-P-111221	Aqueous	PFOS	PFAS by ID	5.5		ng/L	6
002	SWRP-P-111221	Aqueous	PFBS	PFAS by ID	40	Q	ng/L	8
002	SWRP-P-111221	Aqueous	PFPeS	PFAS by ID	9.0	JQ	ng/L	8
002	SWRP-P-111221	Aqueous	PFHxS	PFAS by ID	86	Q	ng/L	8
002	SWRP-P-111221	Aqueous	PFBA	PFAS by ID	43	Q	ng/L	8
002	SWRP-P-111221	Aqueous	PFHpA	PFAS by ID	14	JQ	ng/L	8
002	SWRP-P-111221	Aqueous	PFHxA	PFAS by ID	41	Q	ng/L	8
002	SWRP-P-111221	Aqueous	PFOA	PFAS by ID	21	Q	ng/L	8
002	SWRP-P-111221	Aqueous	PFPeA	PFAS by ID	71	Q	ng/L	8
002	SWRP-P-111221	Aqueous	PFOS	PFAS by ID	100	Q	ng/L	8
003	SCOF-P-111221	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	10
003	SCOF-P-111221	Aqueous	PFPeS	PFAS by ID	0.99	J	ng/L	10
003	SCOF-P-111221	Aqueous	PFHxS	PFAS by ID	5.4		ng/L	10
003	SCOF-P-111221	Aqueous	PFBA	PFAS by ID	1.5	J	ng/L	10
003	SCOF-P-111221	Aqueous	PFHxA	PFAS by ID	2.1	J	ng/L	10
003	SCOF-P-111221	Aqueous	PFOA	PFAS by ID	1.1	J	ng/L	10
003	SCOF-P-111221	Aqueous	PFPeA	PFAS by ID	1.1	J	ng/L	10
003	SCOF-P-111221	Aqueous	PFOS	PFAS by ID	7.4		ng/L	10
004	B1914-P-111221	Aqueous	8:2 FTS	PFAS by ID	30		ng/L	12
004	B1914-P-111221	Aqueous	6:2 FTS	PFAS by ID	230		ng/L	12
004	B1914-P-111221	Aqueous	PFBS	PFAS by ID	130		ng/L	12
004	B1914-P-111221	Aqueous	PFHpS	PFAS by ID	31		ng/L	12
004	B1914-P-111221	Aqueous	PFOSA	PFAS by ID	1.2	J	ng/L	12
004	B1914-P-111221	Aqueous	PFPeS	PFAS by ID	110		ng/L	12
004	B1914-P-111221	Aqueous	PFHxS	PFAS by ID	930		ng/L	12
004	B1914-P-111221	Aqueous	PFBA	PFAS by ID	66		ng/L	12
004	B1914-P-111221	Aqueous	PFDA	PFAS by ID	1.1	J	ng/L	12
004	B1914-P-111221	Aqueous	PFHpA	PFAS by ID	78		ng/L	12
004	B1914-P-111221	Aqueous	PFHxA	PFAS by ID	220		ng/L	12
004	B1914-P-111221	Aqueous	PFNA	PFAS by ID	13		ng/L	12
004	B1914-P-111221	Aqueous	PFOA	PFAS by ID	340		ng/L	12
004	B1914-P-111221	Aqueous	PFPeA	PFAS by ID	160		ng/L	12
004	B1914-P-111221	Aqueous	PFOS	PFAS by ID	1400		ng/L	12

(40 detections)

PFAS by LC/MS/MS

Client: BB&E, Inc.
Laboratory ID: WK24009-001
Description: SBOF-P-111221
Matrix: Aqueous
Date Sampled: 11/12/2021 1110
Date Received: 11/17/2021

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/10/2021 2033	MMM	12/08/2021 1451	24928

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2 FTS)	120226-60-0	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	7.0	U	14	7.0	3.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	4.0		3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.2	J	3.5	1.8	0.87	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	6.0		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.9	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.5	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	PFAS by ID SOP	3.5	US	7.0	3.5	1.7	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.1	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5.5		3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		115	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		81	50-150
13C2_PFHxDA		84	50-150
13C2_PFTeDA		81	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Laboratory ID: WK24009-001
Description: SBOF-P-111221
Matrix: Aqueous
Date Sampled: 11/12/2021 1110
Date Received: 11/17/2021

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C3_PFBS		87	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		93	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		87	50-150
d-EtFOSA		91	50-150
d5-EtFOSAA		93	50-150
d9-EtFOSE		79	50-150
d-MeFOSA		81	50-150
d3-MeFOSAA		93	50-150
d7-MeFOSE		92	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Laboratory ID: WK24009-002
Description: SWRP-P-111221
Matrix: Aqueous
Date Sampled: 11/12/2021 1120
Date Received: 11/17/2021

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/10/2021 2054	MMM	12/08/2021 1451	24928

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2 FTS)	120226-60-0	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	38	UQ	75	38	19	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	40	Q	19	9.5	4.7	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	9.0	JQ	19	9.5	4.7	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	86	Q	19	9.5	4.7	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	43	Q	19	9.5	4.7	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	14	JQ	19	9.5	4.7	ng/L	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	41	Q	19	9.5	4.7	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	21	Q	19	9.5	4.7	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	71	Q	19	9.5	4.7	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	100	Q	19	9.5	4.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	20	50-150
13C2_6:2FTS	N	19	50-150
13C2_8:2FTS	N	17	50-150
13C2_PFDoA	N	17	50-150
13C2_PFHxDA	N	16	50-150
13C2_PFTeDA	N	15	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Laboratory ID: WK24009-002
Description: SWRP-P-111221
Matrix: Aqueous
Date Sampled: 11/12/2021 1120
Date Received: 11/17/2021

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C3_PFBS	N	18	50-150
13C3_PFHxS	N	18	50-150
13C3-HFPO-DA	N	18	50-150
13C4_PFBA	N	20	50-150
13C4_PFHpA	N	19	50-150
13C5_PFHxA	N	20	50-150
13C5_PFPeA	N	18	50-150
13C6_PFDA	N	16	50-150
13C7_PFUdA	N	17	50-150
13C8_PFOA	N	17	50-150
13C8_PFOS	N	17	50-150
13C8_PFOSA	N	19	50-150
13C9_PFNA	N	17	50-150
d-EtFOSA	N	16	50-150
d5-EtFOSAA	N	19	50-150
d9-EtFOSE	N	15	50-150
d-MeFOSA	N	13	50-150
d3-MeFOSAA	N	18	50-150
d7-MeFOSE	N	19	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Laboratory ID: WK24009-003
Description: SCOF-P-111221
Matrix: Aqueous
Date Sampled: 11/12/2021 1130
Date Received: 11/17/2021

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/10/2021 2105	MMM	12/08/2021 1451	24928

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2 FTS)	120226-60-0	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	7.0	U	14	7.0	3.4	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.3	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.99	J	3.4	1.7	0.86	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.4		3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.5	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	7.4		3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		112	50-150
13C2_6:2FTS		120	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		93	50-150
13C2_PFHxDA		95	50-150
13C2_PFTeDA		96	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Laboratory ID: WK24009-003
Description: SCOF-P-111221
Matrix: Aqueous
Date Sampled: 11/12/2021 1130
Date Received: 11/17/2021

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C3_PFBS		101	50-150
13C3_PFHxS		100	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		98	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		102	50-150
13C8_PFOS		103	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		95	50-150
d-EtFOSA		85	50-150
d5-EtFOSAA		99	50-150
d9-EtFOSE		93	50-150
d-MeFOSA		88	50-150
d3-MeFOSAA		98	50-150
d7-MeFOSE		108	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Laboratory ID: WK24009-004
Description: B1914-P-111221
Matrix: Aqueous
Date Sampled: 11/12/2021 1440
Date Received: 11/17/2021

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/10/2021 2116	MMM	12/08/2021 1451	24928
2	SOP SPE	PFAS by ID SOP QSM B-15	5	12/11/2021 2330	MMM	12/08/2021 1451	24928

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	30		8.3	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	230		8.3	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2 FTS)	120226-60-0	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	8.5	U	17	8.5	4.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	130		4.1	2.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	31		4.1	2.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.2	J	4.1	2.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	110		4.1	2.1	1.0	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	930		21	11	5.2	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	66		4.1	2.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.1	J	4.1	2.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	78		4.1	2.1	1.0	ng/L	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	220		4.1	2.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	13		4.1	2.1	1.0	ng/L	1
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	340		4.1	2.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	160		4.1	2.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1400		21	11	5.2	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		102	50-150		107	50-150
13C2_6:2FTS		84	50-150		93	50-150
13C2_8:2FTS		69	50-150		87	50-150
13C2_PFDoA		62	50-150		91	50-150
13C2_PFHxDA		65	50-150		105	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Laboratory ID: WK24009-004
Description: B1914-P-111221
Matrix: Aqueous
Date Sampled: 11/12/2021 1440
Date Received: 11/17/2021

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_PFTeDA		53	50-150		87	50-150
13C3_PFBS		77	50-150		93	50-150
13C3_PFHxS		76	50-150		89	50-150
13C3-HFPO-DA		74	50-150		100	50-150
13C4_PFBA		76	50-150		91	50-150
13C4_PFHpA		72	50-150		86	50-150
13C5_PFHxA		76	50-150		90	50-150
13C5_PFPeA		73	50-150		88	50-150
13C6_PFDA		69	50-150		93	50-150
13C7_PFUdA		65	50-150		81	50-150
13C8_PFOA		73	50-150		94	50-150
13C8_PFOS		69	50-150		84	50-150
13C8_PFOSA		69	50-150		94	50-150
13C9_PFNA		63	50-150		90	50-150
d-EtFOSA		66	50-150		97	50-150
d5-EtFOSAA		70	50-150		95	50-150
d9-EtFOSE		63	50-150		84	50-150
d-MeFOSA		57	50-150		80	50-150
d3-MeFOSAA		70	50-150		89	50-150
d7-MeFOSE		66	50-150		93	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ24928-001
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
10:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
EtFOSA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
EtFOSE	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
MeFOSA	8.0	U	1	16	8.0	4.0	ng/L	12/10/2021 1919
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
MeFOSE	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFDOS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFHxDA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFODA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		136	50-150
13C2_6:2FTS	N	195	50-150
13C2_8:2FTS		106	50-150
13C2_PFDoA		97	50-150
13C2_PFHxDA		55	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ24928-001
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Surrogate	Q	% Rec	Acceptance Limit
13C2_PFTeDA		75	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		110	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBA		109	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		117	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		101	50-150
13C8_PFOA		121	50-150
13C8_PFOS		103	50-150
13C8_PFOSA		102	50-150
13C9_PFNA		99	50-150
d-EtFOSA		95	50-150
d5-EtFOSAA		102	50-150
d9-EtFOSE		98	50-150
d-MeFOSA		80	50-150
d3-MeFOSAA		103	50-150
d7-MeFOSE		113	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ24928-002
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	97	70-150	12/14/2021 1737
11Cl-PF3OUdS	15	13		1	89	70-150	12/14/2021 1737
8:2 FTS	15	16		1	104	67-138	12/14/2021 1737
6:2 FTS	15	15		1	101	64-140	12/14/2021 1737
10:2 FTS	15	16		1	101	70-150	12/14/2021 1737
4:2 FTS	15	15		1	103	63-143	12/14/2021 1737
GenX	32	32		1	99	70-150	12/14/2021 1737
ADONA	15	15		1	100	70-150	12/14/2021 1737
EtFOSA	16	20		1	123	70-150	12/14/2021 1737
EtFOSAA	16	16		1	103	61-135	12/14/2021 1737
EtFOSE	16	16		1	102	70-150	12/14/2021 1737
MeFOSA	16	18		1	112	68-141	12/14/2021 1737
MeFOSAA	16	17		1	106	65-136	12/14/2021 1737
MeFOSE	16	16		1	99	70-150	12/14/2021 1737
PFBS	14	15		1	108	72-130	12/14/2021 1737
PFDS	15	14		1	91	53-142	12/14/2021 1737
PFHpS	15	16		1	102	69-134	12/14/2021 1737
PFNS	15	15		1	98	69-127	12/14/2021 1737
PFOSA	16	17		1	106	67-137	12/14/2021 1737
PFPeS	15	17		1	113	71-127	12/14/2021 1737
PFDOS	15	11		1	68	60-135	12/14/2021 1737
PFHxS	15	15		1	101	68-131	12/14/2021 1737
PFBA	16	16		1	103	73-129	12/14/2021 1737
PFDA	16	15		1	95	71-129	12/14/2021 1737
PFDoA	16	18		1	114	72-134	12/14/2021 1737
PFHpA	16	16		1	101	72-130	12/14/2021 1737
PFHxDA	16	15		1	92	60-135	12/14/2021 1737
PFHxA	16	16		1	98	72-129	12/14/2021 1737
PFNA	16	16		1	99	69-130	12/14/2021 1737
PFODA	16	12		1	72	60-135	12/14/2021 1737
PFOA	16	17		1	105	71-133	12/14/2021 1737
PFPeA	16	16		1	101	72-129	12/14/2021 1737
PFTeDA	16	16		1	101	71-132	12/14/2021 1737
PFTrDA	16	14		1	89	65-144	12/14/2021 1737
PFUdA	16	17		1	106	69-133	12/14/2021 1737
PFOS	15	14		1	96	65-140	12/14/2021 1737

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		99	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		76	50-150
13C2_PFHxDA		68	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS - LCS

Sample ID: WQ24928-002
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Surrogate	Q	% Rec	Acceptance Limit
13C2_PFTeDA		74	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		97	50-150
13C6_PFDA		98	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		96	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		101	50-150
d-EtFOSA		79	50-150
d5-EtFOSAA		92	50-150
d9-EtFOSE		88	50-150
d-MeFOSA		75	50-150
d3-MeFOSAA		104	50-150
d7-MeFOSE		89	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WK24009-001MS
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	14		1	106	70-150	12/10/2021 2044
11Cl-PF3OUdS	ND	13	12		1	93	70-150	12/10/2021 2044
8:2 FTS	ND	13	13		1	99	67-138	12/10/2021 2044
6:2 FTS	ND	13	14		1	105	64-140	12/10/2021 2044
10:2 FTS	ND	14	9.7		1	72	70-150	12/10/2021 2044
4:2 FTS	ND	13	16		1	121	63-143	12/10/2021 2044
GenX	ND	28	30		1	106	70-150	12/10/2021 2044
ADONA	ND	13	14		1	107	70-150	12/10/2021 2044
EtFOSA	ND	14	14		1	102	70-150	12/10/2021 2044
EtFOSAA	ND	14	13		1	93	61-135	12/10/2021 2044
EtFOSE	ND	14	15		1	108	70-150	12/10/2021 2044
MeFOSA	ND	14	16		1	114	68-141	12/10/2021 2044
MeFOSAA	ND	14	14		1	97	65-136	12/10/2021 2044
MeFOSE	ND	14	13		1	96	70-150	12/10/2021 2044
PFBS	4.0	12	16		1	100	72-130	12/10/2021 2044
PFDS	ND	14	14		1	100	53-142	12/10/2021 2044
PFHpS	ND	13	15		1	111	69-134	12/10/2021 2044
PFNS	ND	13	13		1	98	69-127	12/10/2021 2044
PFOSA	ND	14	14		1	99	67-137	12/10/2021 2044
PFPeS	1.2	13	14		1	99	71-127	12/10/2021 2044
PFDOS	ND	14	13		1	97	60-135	12/10/2021 2044
PFHxS	6.0	13	20		1	111	68-131	12/10/2021 2044
PFBA	2.9	14	18		1	110	73-129	12/10/2021 2044
PFDA	ND	14	16		1	116	71-129	12/10/2021 2044
PFDoA	ND	14	16		1	115	72-134	12/10/2021 2044
PFHpA	ND	14	16		1	117	72-130	12/10/2021 2044
PFHxDA	ND	14	14		1	101	60-135	12/10/2021 2044
PFHxA	1.5	14	17		1	109	72-129	12/10/2021 2044
PFNA	ND	14	16		1	113	69-130	12/10/2021 2044
PFODA	ND	14	7.1	N	1	50	60-135	12/10/2021 2044
PFOA	1.1	14	16		1	108	71-133	12/10/2021 2044
PFPeA	1.7	14	17		1	110	72-129	12/10/2021 2044
PFTeDA	ND	14	15		1	108	71-132	12/10/2021 2044
PFTrDA	ND	14	16		1	111	65-144	12/10/2021 2044
PFUdA	ND	14	16		1	112	69-133	12/10/2021 2044
PFOS	5.5	13	20		1	109	65-140	12/10/2021 2044

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		106	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		83	50-150
13C2_PFHxDA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS - MS

Sample ID: WK24009-001MS
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Surrogate	Q	% Rec	Acceptance Limit
13C2_PFTeDA		76	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		87	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		92	50-150
13C8_PFOS		90	50-150
13C8_PFOSA		89	50-150
13C9_PFNA		82	50-150
d-EtFOSA		85	50-150
d5-EtFOSAA		95	50-150
d9-EtFOSE		88	50-150
d-MeFOSA		77	50-150
d3-MeFOSAA		90	50-150
d7-MeFOSE		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WK24009-004DU
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	12/10/2021 2126
11Cl-PF3OUdS	ND	ND		1	0.00	20	12/10/2021 2126
8:2 FTS	30	26		1	14	20	12/10/2021 2126
6:2 FTS	230	170	+	1	30	20	12/10/2021 2126
10:2 FTS	ND	ND		1	0.00	20	12/10/2021 2126
4:2 FTS	ND	ND		1	0.00	20	12/10/2021 2126
GenX	ND	ND		1	0.00	20	12/10/2021 2126
ADONA	ND	ND		1	0.00	20	12/10/2021 2126
EtFOSA	ND	ND		1	0.00	20	12/10/2021 2126
EtFOSAA	ND	ND		1	0.00	20	12/10/2021 2126
EtFOSE	ND	ND		1	0.00	20	12/10/2021 2126
MeFOSA	ND	ND		1	0.00	20	12/10/2021 2126
MeFOSAA	ND	ND		1	0.00	20	12/10/2021 2126
MeFOSE	ND	ND		1	0.00	20	12/10/2021 2126
PFBS	130	95	+	1	30	20	12/10/2021 2126
PFDS	ND	ND		1	0.00	20	12/10/2021 2126
PFHpS	31	26		1	17	20	12/10/2021 2126
PFNS	ND	ND		1	0.00	20	12/10/2021 2126
PFOSA	1.2	ND		1	0.00	20	12/10/2021 2126
PFPeS	110	94		1	20	20	12/10/2021 2126
PFDOS	ND	ND		1	0.00	20	12/10/2021 2126
PFHxS	1000	820	E	1	20	20	12/10/2021 2126
PFBA	66	54		1	19	20	12/10/2021 2126
PFDA	1.1	ND		1	0.00	20	12/10/2021 2126
PFDoA	ND	ND		1	0.00	20	12/10/2021 2126
PFHpA	78	56	+	1	33	20	12/10/2021 2126
PFHxDA	ND	ND		1	0.00	20	12/10/2021 2126
PFHxA	220	190		1	16	20	12/10/2021 2126
PFNA	13	11	+	1	22	20	12/10/2021 2126
PFODA	ND	ND		1	0.00	20	12/10/2021 2126
PFOA	340	260	+	1	25	20	12/10/2021 2126
PFPeA	160	120	+	1	31	20	12/10/2021 2126
PFTeDA	ND	ND		1	0.00	20	12/10/2021 2126
PFTrDA	ND	ND		1	0.00	20	12/10/2021 2126
PFUdA	ND	ND		1	0.00	20	12/10/2021 2126
PFOS	1500	1300	E	1	19	20	12/10/2021 2126

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		123	50-150
13C2_6:2FTS		106	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		82	50-150
13C2_PFHxDA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS - Duplicate

Sample ID: WK24009-004DU
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Surrogate	Q	% Rec	Acceptance Limit
13C2_PFTeDA		79	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		90	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		77	50-150
d-EtFOSA		93	50-150
d5-EtFOSAA		93	50-150
d9-EtFOSE		87	50-150
d-MeFOSA		86	50-150
d3-MeFOSAA		90	50-150
d7-MeFOSE		103	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Chain of Custody

and

Miscellaneous Documents

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

SHEALY

Chain of Custody Record

Number

Client: BBE	Report to Contact: brian.d.reddig@nasa.gov	Telephone No. / E-mail: 408-903-7672	Quote No.
Address: NASA Ames	Sampler's Signature: X	Analysis (Attach list if more space is needed): Full List 36 PFAS by DoD FD	Page 1 of 1
City: Moffett Field State: CA Zip Code: 94035	Printed Name: BR/MN/JZ		
Project Name: PFAS Outfall			WK24009
Project Number	P.O No.		MKM

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	3035 Kit	See above →	Remarks / Cooler I.D.
SBOF-P-111221	11-12-21	1110	G	X									X	
SWRP-P-111221	"	1120	G	X									X	
SCOF-P-111221	"	1130	G	X									X	
B191-P-111221	11-12-21	1440	G	X									X	

Turn Around Time Required (Prior lab approval required for expedited TAT): [X] Standard [ ] Rush (Please Specify)

Sample Disposal: [ ] Return to Client [X] Disposal by Lab

Possible Hazard Identification (List any known hazards in the remarks): [X] Non-Hazardous [ ] Flammable [ ] Skin Irritant [ ] SDS provided [ ] Unknown

QC Requirements

1. Relinquished by: JR Tubos	Date: 11-15-21	Time: 1130	1. Received by	Date	Time
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: Fedex	Date: 11/17/21	Time: 1605	4. Laboratory Received by: Chris VanDamm	Date: 11/17/21	Time: 1605

Note. All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on Ice (Check) [X] Y [ ] N [ ] Ice Pack

Receipt Temp. 5.1 °C

Document Number: ME002OW-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: BBE Cooler Inspected by/date: JSH / 11/24/2021 Lot #: WK24009

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.1 / 3.1 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JRG2 Date: 11/24/2021

Comments:

APPENDIX H
DATA VALIDATION REPORTS

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.9	1.9	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.7	11CL-PF3OUDS	3.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.9	1.9	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.7	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	3.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.9	21		ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.7	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	21	NG/L		Y		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.9	1.9	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.7	4-2 FLUOROTELOMER SULFONATE	3.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.9	1.9	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.9	1.9	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.7	9CL-PF3ONS	3.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.9	1.9	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	3.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.9	1.9	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.9	1.9	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.9	1.6	J	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.6	NG/L	J	Y	P	Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUORODECANESULFONIC ACID (PFDS)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUORONONANESULFONIC ACID (PFNS)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	6.8		ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROBUTANOIC ACID (PFBA)	6.8	NG/L		Y		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROHEPTANOIC ACID (PFHPA)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROHEXANOIC ACID (PFHXA)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUORONONANOIC ACID (PFNA)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	1	J	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1	NG/L	J	Y	P	Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROPENTANOIC ACID (PFPEA)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	0.92	U	ng/L	07/07/2021	07/20/2021	11:45:00	07/21/2021	16:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/10/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	2.2	J	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROHEXANESULFONIC ACID (PFHXS)	2.2	NG/L	J	Y	P	Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	0.96	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/10/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROOCTANESULFONIC ACID (PFOS)	1.9	NG/L	U	N		Y
WG10017-001	WG10017	NM	AOPC10-WGC2-6-070721	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.2	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.2	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	6.9	J	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.2	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	6.9	NG/L	J	Y	P	Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.2	4-2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.2	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.2	9CL-PF3ONS	3.6	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.2	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	3.6	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.2	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.6	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.2	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.6	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	1.1	J	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.1	NG/L	J	Y	P	Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	4.1		ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROBUTANOIC ACID (PFBA)	4.1	NG/L		Y		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROHEXANOIC ACID (PFHXA)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUORONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	3.7		ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PENTADECAFLUOROOCTANOIC ACID (PFOA)	3.7	NG/L		Y		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROPENTANOIC ACID (PFPEA)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	5.4		ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROHEXANESULFONIC ACID (PFHXS)	5.4	NG/L		Y		Y
WG10017-002	WG10017	NM	AOPC10-WGC2-12-070721	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	0.91	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/10/2021	PACE ANALYTICAL	1		N		0.91	3.6	PERFLUOROOCTANESULFONIC ACID (PFOS)	1.8	NG/L	U	N		Y
WG10017-003	WG10017	FD	AOPC10-WGC2-12-070721-FD	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.1	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG10017-003	WG10017	FD	AOPC10-WGC2-12-070721-FD	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.1	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG10017-003	WG10017	FD	AOPC10-WGC2-12-070721-FD	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	9.9		ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.1	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	9.9	NG/L		Y		Y
WG10017-003	WG10017	FD	AOPC10-WGC2-12-070721-FD	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.1	4-2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG10017-003	WG10017	FD	AOPC10-WGC2-12-070721-FD	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1		N		1.8	7.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG10017-003	WG10017	FD	AOPC10-WGC2-12-070721-FD	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	14:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	0.88	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.8	NG/L	U	N		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	6.1		ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLUOROBUTANOIC ACID (PFBA)	6.1	NG/L		Y		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.88	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.88	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLURODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	1.1	J	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	1.1	NG/L	J	Y	P	Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	0.88	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	1.8	NG/L	U	N		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.88	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLURONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	11		ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PENTADECAFLUOROOCTANOIC ACID (PFOA)	11	NG/L		Y		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	2.3	J	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLUOROPENTANOIC ACID (PFPEA)	2.3	NG/L	J	Y	P	Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.7	0.82	U	ng/L	07/07/2021	07/20/2021	11:45:00	07/21/2021	16:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/10/2021	PACE ANALYTICAL	1		N		0.82	3.3	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.7	NG/L	U	N		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.88	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.88	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	4.5		ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLUOROHEXANESULFONIC ACID (PFHXS)	4.5	NG/L		Y		Y
WG10017-005	WG10017	NM	ADPC10-WGC2-5-070721	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	2.4	J	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/10/2021	PACE ANALYTICAL	1		N		0.88	3.5	PERFLUOROOCTANESULFONIC ACID (PFOS)	2.4	NG/L	J	Y	P	Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.8	1.9	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.6	11CL-PF3OUDS	3.8	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.8	1.9	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.6	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.8	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.8	1.9	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.6	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.8	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.8	1.9	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.6	4:2 FLUOROTELOMER SULFONATE	3.8	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.8	1.9	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.6	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.8	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.8	1.9	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.6	9CL-PF3ONS	3.8	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.8	1.9	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.6	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.8	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.8	1.9	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.6	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.8	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.8	1.9	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/10/2021	PACE ANALYTICAL	1		N		1.9	7.6	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.8	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	1-butanesulfonic acid (PFBS)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	1-decanesulfonic acid (PFDS)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUORODECANESULFONIC ACID (PFDS)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLURONONANESULFONIC ACID (PFNS)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROBUTANOIC ACID (PFBA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLURODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROHEPTANOIC ACID (PFHPA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROHEXANOIC ACID (PFHXA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLURONONANOIC ACID (PFNA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROPENTANOIC ACID (PFPEA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2.3	1.1	U	ng/L	07/08/2021	07/20/2021	11:45:00	07/21/2021	16:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/10/2021	PACE ANALYTICAL	1		N		1.1	4.5	PERFLUOROTETRADECANOIC ACID (PFTEA)	2.3	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.9	NG/L	U	N		Y
WG10017-006	WG10017	NM	ERB-01-070721	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	0.95	U	ng/L	07/08/2021	07/14/2021	11:50:00	07/15/2021	16:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/10/2021	PACE ANALYTICAL	1		N		0.95	3.8	PERFLUOROOCTANESULFONIC ACID (PFOS)	1.9	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	5	2.5	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1		N		2.5	10	11CL-PF3OUDS	5	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	5	2.5	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1		N		2.5	10	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	5	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	5	2.5	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1		N		2.5	10	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	5	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	5	2.5	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1		N		2.5	10	4:2 FLUOROTELOMER SULFONATE	5	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	5	2.5	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1		N		2.5	10	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	5	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	5	2.5	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1		N		2.5	10	9CL-PF3ONS	5	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Hexafluoropropylene oxide dimer acid (GenX)	5	2.5	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1		N		2.5	10	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	5	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	5	2.5	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/10/2021	PACE ANALYTICAL	1		N		2.5	10	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	5	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	5	2.5	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/10/2021	PACE ANALYTICAL	1		N		2.5	10	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	5	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROBUTANESULFONIC ACID (PFBS)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUORODECANESULFONIC ACID (PFDS)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLURONONANESULFONIC ACID (PFNS)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROPENTANESULFONIC ACID (PFPES)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-n-butanoic acid (PFBA)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROBUTANOIC ACID (PFBA)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-n-decanoic acid (PFDA)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUORODECANOIC ACID (PFDA)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLURODODECANOIC ACID (PFDOA)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROHEPTANOIC ACID (PFHPA)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROHEXANOIC ACID (PFHXA)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-n-nonanoic acid (PFNA)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLURONONANOIC ACID (PFNA)	2.6	NG/L	U	N		Y
WG10017-007	WG10017	NM	FB-01-070721	AQ	Perfluoro-n-octanoic acid (PFOA)	2.6	1.3	U	ng/L	07/07/2021	07/14/2021	11:50:00	07/15/2021	16:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1		N

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.5	1.8	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1	N			1.8	7	11CL-PF3OUDS	3.5	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.5	1.8	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1	N			1.8	7	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	3.5	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.5	4.1	J	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1	N			1.8	7	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	4.1	NG/L	J	Y	P	Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.5	1.8	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1	N			1.8	7	4-2 FLUOROTELOMER SULFONATE	3.5	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.5	1.8	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1	N			1.8	7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.5	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.5	1.8	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1	N			1.8	7	9CL-PF3ONS	3.5	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.5	1.8	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1	N			1.8	7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.5	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.5	1.8	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/10/2021	PACE ANALYTICAL	1	N			1.8	7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.5	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.5	1.8	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/10/2021	PACE ANALYTICAL	1	N			1.8	7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.5	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	37		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROBUTANESULFONIC ACID (PFBS)	37	NG/L		Y		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.88	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLURODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	5.7		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	5.7	NG/L		Y		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.88	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.88	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	29		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	29	NG/L		Y		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	96		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROBUTANOIC ACID (PFBA)	96	NG/L		Y		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.88	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.88	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLURODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	1.9	J	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	1.9	NG/L	J	Y	P	Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	7.2		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	7.2	NG/L		Y		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	1.4	J	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORONONANOIC ACID (PFNA)	1.4	NG/L	J	Y	P	Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	48	B	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PENTADECAFLUOROOCTANOIC ACID (PFOA)	48	NG/L		Y		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	12		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROPENTANOIC ACID (PFPEA)	12	NG/L		Y		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.88	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.88	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.88	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	190		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEXANESULFONIC ACID (PFHXS)	190	NG/L		Y		Y
WG10017-010	WG10017	NM	ADPC17-W3-8-070821	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	150		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:19:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROOCTANESULFONIC ACID (PFOS)	150	NG/L		Y		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	6.5	3.3	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1	N			3.3	13	11CL-PF3OUDS	6.5	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	6.5	3.3	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1	N			3.3	13	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	6.5	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	6.5	8.4	J	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1	N			3.3	13	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	8.4	NG/L	J	Y	P	Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	6.5	3.3	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1	N			3.3	13	4-2 FLUOROTELOMER SULFONATE	6.5	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	6.5	3.3	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1	N			3.3	13	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	6.5	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	6.5	3.3	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1	N			3.3	13	9CL-PF3ONS	6.5	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Hexafluoropropylene oxide dimer acid (GenX)	6.5	3.3	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1	N			3.3	13	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	6.5	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic a	6.5	3.3	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/10/2021	PACE ANALYTICAL	1	N			3.3	13	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	6.5	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	6.5	3.3	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/10/2021	PACE ANALYTICAL	1	N			3.3	13	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	6.5	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	3.3	6.6		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROBUTANESULFONIC ACID (PFBS)	6.6	NG/L		Y		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	3.3	1.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLURODECANESULFONIC ACID (PFDS)	3.3	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	3.3	1.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	3.3	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	3.3	1.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUORONONANESULFONIC ACID (PFNS)	3.3	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	3.3	1.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROOCTANE SULFONAMIDE (FOSA)	3.3	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	3.3	2	J	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	2	NG/L	J	Y	P	Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-butanoic acid (PFBA)	3.3	16		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROBUTANOIC ACID (PFBA)	16	NG/L		Y		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-decanoic acid (PFDA)	3.3	1.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUORODECANOIC ACID (PFDA)	3.3	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	3.3	1.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLURODODECANOIC ACID (PFDOA)	3.3	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-heptanoic acid (PFHpA)	3.3	3.5	J	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROHEPTANOIC ACID (PFHPA)	3.5	NG/L	J	Y	P	Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-hexanoic acid (PFHxA)	3.3	6.4	J	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROHEXANOIC ACID (PFHXA)	6.4	NG/L	J	Y	P	Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-nonanoic acid (PFNA)	3.3	1.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUORONONANOIC ACID (PFNA)	3.3	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-octanoic acid (PFOA)	3.3	44	B	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PENTADECAFLUOROOCTANOIC ACID (PFOA)	44	NG/L		Y		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-pentanoic acid (PFPeA)	3.3	6.6		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROPENTANOIC ACID (PFPEA)	6.6	NG/L		Y		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	3.3	1.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROTETRADECANOIC ACID (PFTEA)	3.3	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	3.3	1.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROTRIDECANOIC ACID (PFTRIA)	3.3	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluoro-n-undecanoic acid (PFUdA)	3.3	1.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROUNDECANOIC ACID (PFUNA)	3.3	NG/L	U	N		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluorohexanesulfonic acid (PFHxS)	3.3	40		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROHEXANESULFONIC ACID (PFHXS)	40	NG/L		Y		Y
WG10017-011	WG10017	NM	ADPC16-WUS-9-070821	AQ	Perfluorooctanesulfonic acid (PFOS)	3.3	47		ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	17:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/10/2021	PACE ANALYTICAL	1	N			1.6	6.5	PERFLUOROOCTANESULFONIC ACID (PFOS)	47	NG/L		Y		Y
WG10017-012	WG10017	NM	FB-02-070821	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	5	2.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	18:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1	N			2.6	10	11CL-PF3OUDS	5	NG/L	U	N		Y
WG10017-012	WG10017	NM	FB-02-070821	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	5	2.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	18:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1	N			2.6	10	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	5	NG/L	U	N		Y
WG10017-012	WG10017	NM	FB-02-070821	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	5	2.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	18:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1	N			2.6	10	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	5	NG/L	U	N		Y
WG10017-012	WG10017	NM	FB-02-070821	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	5	2.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	18:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1	N			2.6	10	4-2 FLUOROTELOMER SULFONATE	5	NG/L	U	N		Y
WG10017-012	WG10017	NM	FB-02-070821	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	5	2.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	18:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1	N			2.6	10	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	5	NG/L	U	N		Y
WG10017-012	WG10017	NM	FB-02-070821	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	5	2.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	18:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1	N			2.6	10	9CL-PF3ONS	5	NG/L	U	N		Y
WG10017-012	WG10017	NM	FB-02-070821	AQ	Hexafluoropropylene oxide dimer acid (GenX)	5	2.6	U	ng/L	07/08/2021	07/16/2021	11:40:00	07/17/2021	18:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1	N			2.6	10	HEXAFLUO

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.7	0.86	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.7	NG/L	U	N		Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-butanoic acid (PFBA)	1.7	4.4		ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROBUTANOIC ACID (PFBA)	4.4	NG/L				Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-decanoic acid (PFDA)	1.7	0.86	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUORODECANOIC ACID (PFDA)	1.7	NG/L	U	N		Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.7	0.86	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUORODODECANOIC ACID (PFDOA)	1.7	NG/L	U	N		Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.7	2.8	J	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROHEPTANOIC ACID (PFHPA)	2.8	NG/L	J	Y	P	Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.7	15		ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROHEXANOIC ACID (PFHXA)	15	NG/L				Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.7	0.86	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUORONONANOIC ACID (PFNA)	1.7	NG/L	U	N		Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-octanoic acid (PFOA)	1.7	110	B5	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PENTADECAFLUOROOCTANOIC ACID (PFOA)	110	NG/L	J	Y	D	Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.7	4.9		ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROPENTANOIC ACID (PFPEA)	4.9	NG/L		Y		Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.7	0.86	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.7	NG/L	UJ	N	N	Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.7	0.86	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.7	NG/L	U	N		Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.7	0.86	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROUNDECANOIC ACID (PFUNA)	1.7	NG/L	U	N		Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.7	1.4	J	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.4	NG/L	J	Y	P	Y
WG10017-014	WG10017	NM	AOPC8-W1-20-070921	AQ	Perfluorooctanesulfonic acid (PFOS)	1.7	0.86	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	18:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/10/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROOCTANESULFONIC ACID (PFOS)	1.7	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.5	1.7	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1	N			1.7	7	11CL-PF3OUDS	3.5	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.5	1.7	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1	N			1.7	7	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.5	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.5	160		ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1	N			1.7	7	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	160	NG/L		Y		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.5	1.7	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1	N			1.7	7	4:2 FLUOROTELOMER SULFONATE	3.5	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.5	1.7	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1	N			1.7	7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.5	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.5	1.7	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1	N			1.7	7	9CL-PF3ONS	3.5	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.5	1.7	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1	N			1.7	7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.5	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.5	1.7	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/10/2021	PACE ANALYTICAL	1	N			1.7	7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.5	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.5	1.7	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/10/2021	PACE ANALYTICAL	1	N			1.7	7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.5	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	1	J	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROBUTANOIC ACID (PFBA)	1	NG/L	J	Y	P	Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUORONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROPENTANOIC ACID (PFPEA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.8	NG/L	U	N		Y
WG10017-015	WG10017	NM	AOPC8-W1-19-070921	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	0.87	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:05:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/10/2021	PACE ANALYTICAL	1	N			0.87	3.5	PERFLUOROOCTANESULFONIC ACID (PFOS)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.1	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.1	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	160		ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.1	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	160	NG/L		Y		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.1	4:2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.1	9CL-PF3ONS	3.6	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.1	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.6	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.1	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.6	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.1	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.6	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	0.92	J	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROBUTANOIC ACID (PFBA)	0.92	NG/L	J	Y	P	Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	1.8	NG/L	U	N		Y
WG10017-016	WG10017	FD	AOPC8-W1-19-070921-FD	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.88	U	ng/L	07/09/2021	07/16/2021

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.2	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.2	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	79		ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.2	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	79	NG/L		Y		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.2	4:2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.2	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.2	9CL-PF3ONS	3.6	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.2	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	3.6	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.2	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.6	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.6	1.8	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/10/2021	PACE ANALYTICAL	1	N			1.8	7.2	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.6	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	3.7		ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROBUTANOIC ACID (PFBA)	3.7	NG/L		Y		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	1.3	J	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEXANOIC ACID (PFHXA)	1.3	NG/L	J	Y	P	Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	1.4	BJ	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.4	NG/L	U	N	A	Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROPENTANOIC ACID (PFPEA)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	1.4	J	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.4	NG/L	J	Y	P	Y
WG10017-019	WG10017	NM	ADPC8-W1-S-070921	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	0.9	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:48:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/10/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROOCTANESULFONIC ACID (PFOS)	1.8	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.8	1.9	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1	N			1.9	7.5	11CL-PF3OUDS	3.8	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.8	37		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1	N			1.9	7.5	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	37	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	38	4600		ng/L	07/08/2021	07/19/2021	12:50:00	07/22/2021	18:56:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	10	N			19	75	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	4600	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.8	130		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1	N			1.9	7.5	4:2 FLUOROTELOMER SULFONATE	130	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.8	1.9	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1	N			1.9	7.5	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.8	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.8	1.9	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1	N			1.9	7.5	9CL-PF3ONS	3.8	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.8	1.9	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1	N			1.9	7.5	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	3.8	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.8	1.9	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/10/2021	PACE ANALYTICAL	1	N			1.9	7.5	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.8	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.8	1.9	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/10/2021	PACE ANALYTICAL	1	N			1.9	7.5	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.8	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.9	43		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROBUTANESULFONIC ACID (PFBS)	43	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.9	0.93	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUORODECANESULFONIC ACID (PFDS)	1.9	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	12		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	12	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	0.93	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUORONONANESULFONIC ACID (PFNS)	1.9	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	0.93	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.9	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	42		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROPENTANESULFONIC ACID (PFPES)	42	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	580		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROBUTANOIC ACID (PFBA)	580	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	1.2	J	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUORODECANOIC ACID (PFDA)	1.2	NG/L	J	Y	P	Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.93	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	480		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROHEPTANOIC ACID (PFHPA)	480	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-hexanoic acid (PFHxA)	19	1400		ng/L	07/08/2021	07/19/2021	12:50:00	07/22/2021	18:56:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/10/2021	PACE ANALYTICAL	10	N			9.3	37	PERFLUOROHEXANOIC ACID (PFHXA)	1400	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	16		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUORONONANOIC ACID (PFNA)	16	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	350		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PENTADECAFLUOROOCTANOIC ACID (PFOA)	350	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-pentanoic acid (PFPeA)	19	1300		ng/L	07/08/2021	07/19/2021	12:50:00	07/22/2021	18:56:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/10/2021	PACE ANALYTICAL	10	N			9.3	37	PERFLUOROPENTANOIC ACID (PFPEA)	1300	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	0.93	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.9	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.93	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.93	U	ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	350		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROHEXANESULFONIC ACID (PFHXS)	350	NG/L		Y		Y
WG10017-020	WG10017	NM	ADPC26-W5-3-070821	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	490		ng/L	07/08/2021	07/19/2021	12:50:00	07/20/2021	15:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/10/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROOCTANESULFONIC ACID (PFOS)	490	NG/L		Y		Y
WG10017-021	WG10017	NM	FB-03-070921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	4.1	2	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/10/2021	PACE ANALYTICAL	1	N			2	8.1	11CL-PF3OUDS	4.1	NG/L	U	N		Y
WG10017-021	WG10017	NM	FB-03-070921	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	4.1	2	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/10/2021	PACE ANALYTICAL	1	N			2	8.1	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	4.1	NG/L	U	N		Y
WG10017-021	WG10017	NM	FB-03-070921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4.1	2	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/10/2021	PACE ANALYTICAL	1	N			2	8.1	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	4.1	NG/L	U	N		Y
WG10017-021	WG10017	NM	FB-03-070921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	4.1	2	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/10/2021	PACE ANALYTICAL	1	N			2	8.1	4:2 FLUOROTELOMER SULFONATE	4.1	NG/L	U	N		Y
WG10017-021	WG10017	NM	FB-03-070921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	4.1	2	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/10/2021	PACE ANALYTICAL	1	N			2	8.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	4.1	NG/L	U	N		Y
WG10017-021	WG10017	NM	FB-03-070921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	4.1	2	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/10/2021	PACE ANALYTICAL	1	N			2	8.1	9CL-PF3ONS	4.1	NG/L	U	N		Y
WG10017-021	WG10017	NM	FB-03-070921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	4.1	2	U	ng/L	07/09/2021	07/16/2021	11:40:00	07/17/2021	19:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/10/2021	PACE ANALYTICAL	1	N			2	8.1	HEXAFLUOROP

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.48	0.32	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUORONONANESULFONIC ACID (PFNS)	0.32	UG/KG	J	Y	P	Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.48	0.55	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.55	UG/KG	J	Y	P	Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.48	0.34	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.34	UG/KG	J	Y	P	Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-butanoic acid (PFBA)	0.48	0.47	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROBUTANOIC ACID (PFBA)	0.47	UG/KG	J	Y	P	Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-decanoic acid (PFDA)	0.48	0.47	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUORODECANOIC ACID (PFDA)	0.47	UG/KG	J	Y	P	Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.48	0.19	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUORODODECANOIC ACID (PFDOA)	0.48	UG/KG	U	N		Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.48	0.6	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROHEPTANOIC ACID (PFHPA)	0.6	UG/KG	J	Y	P	Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.48	0.81	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROHEXANOIC ACID (PFHXA)	0.81	UG/KG	J	Y	P	Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-nonanoic acid (PFNA)	0.48	0.72	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUORONONANOIC ACID (PFNA)	0.72	UG/KG	J	Y	P	Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-octanoic acid (PFOA)	0.48	1.1		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.1	UG/KG		Y		Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.48	1.1		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROPENTANOIC ACID (PFPEA)	1.1	UG/KG		Y		Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.48	0.19	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.48	UG/KG	U	N		Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.48	0.19	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.48	UG/KG	U	N		Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.48	0.26	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROUNDECANOIC ACID (PFUNA)	0.26	UG/KG	J	Y	P	Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluorohexanesulfonic acid (PFHxS)	0.48	4.8		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROHEXANESULFONIC ACID (PFHXS)	4.8	UG/KG		Y		Y
WG20002-002	WG20002	NM	ADPC7-SB01-0.5-2	SO	Perfluorooctanesulfonic acid (PFOS)	0.48	140		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N			0.19	0.96	PERFLUOROOCTANESULFONIC ACID (PFOS)	140	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	% Solids	0	76		%	07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y			0	0	% SOLIDS	76	%		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	1.2	0.61	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N			0.61	2.4	11CL-PF3OUDS	1.2	UG/KG	U	N		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	1.2	0.78	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N			0.61	2.4	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	0.78	UG/KG	J	Y	P	Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	1.2	1.3	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N			0.61	2.4	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	1.3	UG/KG	J	Y	P	Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1.2	0.61	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N			0.61	2.4	4:2 FLUOROTELOMER SULFONATE	1.2	UG/KG	U	N		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.2	0.61	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N			0.61	2.4	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.2	UG/KG	U	N		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.2	0.61	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N			0.61	2.4	9CL-PF3ONS	1.2	UG/KG	U	N		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.5	1.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N			1.2	4.9	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	2.5	UG/KG	U	N		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.2	0.61	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N			0.61	2.4	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.2	UG/KG	U	N		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1.2	0.61	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N			0.61	2.4	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1.2	UG/KG	U	N		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.6	0.55	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.55	UG/KG	J	Y	P	Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.6	5.1		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUORODECANESULFONIC ACID (PFDS)	5.1	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.6	1.4		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.4	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.6	4.2		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUORONONANESULFONIC ACID (PFNS)	4.2	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.6	4.6		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROOCTANE SULFONAMIDE (FOSA)	4.6	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.6	1.4		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.4	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-butanoic acid (PFBA)	0.6	3.8		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROBUTANOIC ACID (PFBA)	3.8	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-decanoic acid (PFDA)	0.6	0.95	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUORODECANOIC ACID (PFDA)	0.95	UG/KG	J	Y	P	Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.6	0.24	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUORODODECANOIC ACID (PFDOA)	0.60	UG/KG	U	N		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.6	11		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROHEPTANOIC ACID (PFHPA)	11	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.6	12		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROHEXANOIC ACID (PFHXA)	12	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-nonanoic acid (PFNA)	0.6	2		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUORONONANOIC ACID (PFNA)	2	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-octanoic acid (PFOA)	0.6	3		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PENTADECAFLUOROOCTANOIC ACID (PFOA)	3	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.6	31		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROPENTANOIC ACID (PFPEA)	31	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.6	0.24	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.60	UG/KG	U	N		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.6	0.24	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.60	UG/KG	U	N		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.6	1.4		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROUNDECANOIC ACID (PFUNA)	1.4	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluorohexanesulfonic acid (PFHxS)	0.6	23		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROHEXANESULFONIC ACID (PFHXS)	23	UG/KG		Y		Y
WG20002-003	WG20002	NM	ADPC7-SB02-0.0.5	SO	Perfluorooctanesulfonic acid (PFOS)	3.1	300		ug/kg	07/13/2021	07/25/2021	16:45:00	07/28/2021	14:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	5	N			1.2	4.9	PERFLUOROOCTANESULFONIC ACID (PFOS)	300	UG/KG		Y		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	% Solids	0	83.5	%		07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y			0	0	% SOLIDS	83.5	%		Y		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	1.1	0.54	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N			0.54	2.2	11CL-PF3OUDS	1.1	UG/KG	U	N		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	1.1	0.73	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N			0.54	2.2	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	0.73	UG/KG	J	Y	P	Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	1.1	0.54	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N			0.54	2.2	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	1.1	UG/KG	U	N		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1.1	0.54	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N			0.54	2.2	4:2 FLUOROTELOMER SULFONATE	1.1	UG/KG	U	N		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.1	0.54	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N			0.54	2.2	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.1	UG/KG	U	N		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.1	0.54	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N			0.54	2.2	9CL-PF3ONS	1.1	UG/KG	U	N		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.2	1.1	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.3	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	2.2	UG/KG	U	N		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.1	0.54	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N			0.54	2.2	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.1	UG/KG	U	N		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1.1	0.54	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N			0.54	2.2	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1.1	UG/KG	U	N		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.55	0.41	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N			0.22	1.1	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.41	UG/KG	J	Y	P	Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.55	2.4		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N			0.22	1.1	PERFLUORODECANESULFONIC ACID (PFDS)	2.4	UG/KG		Y		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.55	3		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N			0.22	1.1	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	3	UG/KG		Y		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.55	4.4		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N			0.22	1.1	PERFLUORONONANESULFONIC ACID (PFNS)	4.4	UG/KG		Y		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.55	24		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N			0.22	1.1	PERFLUOROOCTANE SULFONAMIDE (FOSA)	24	UG/KG		Y		Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.55	0.7	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.22	1.1	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.7	UG/KG	J	Y	P	Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	Perfluoro-n-butanoic acid (PFBA)	0.55	0.92	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	18:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.22	1.1	PERFLUOROBUTANOIC ACID (PFBA)	0.92	UG/KG	J	Y	P	Y
WG20002-004	WG20002	NM	ADPC7-SB02-0.5-2	SO	Perfluoro-n-decanoic acid (PFDA)	0.55	2

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG20002-006	WG20002	NM	AOPC1-SB01-0.5-2	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.49	0.8	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.2	0.98	PERFLUOROPENTANOIC ACID (PFPEA)	0.8	UG/KG	J	Y	P	Y
WG20002-006	WG20002	NM	AOPC1-SB01-0.5-2	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.49	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.2	0.98	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.49	UG/KG	U	N		Y
WG20002-006	WG20002	NM	AOPC1-SB01-0.5-2	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.49	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.2	0.98	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.49	UG/KG	U	N		Y
WG20002-006	WG20002	NM	AOPC1-SB01-0.5-2	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.49	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.2	0.98	PERFLUOROUNDECANOIC ACID (PFUNA)	0.49	UG/KG	U	N		Y
WG20002-006	WG20002	NM	AOPC1-SB01-0.5-2	SO	Perfluorohexanesulfonic acid (PFHxS)	0.49	22		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			0.2	0.98	PERFLUOROHEXANESULFONIC ACID (PFHXS)	22	UG/KG		Y		Y
WG20002-006	WG20002	NM	AOPC1-SB01-0.5-2	SO	Perfluorooctanesulfonic acid (PFOS)	0.49	40		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N			0.2	0.98	PERFLUOROCTANESULFONIC ACID (PFOS)	40	UG/KG		Y		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	% Solids	0	98.2		%	07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y		0	0	% SOLIDS	98.2	%		Y			Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	0.9	0.45	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N			0.45	1.8	11CL-PF3OUDS	0.90	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	0.9	0.45	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N			0.45	1.8	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	0.90	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	0.9	0.45	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N			0.45	1.8	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	0.90	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	0.9	0.45	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N			0.45	1.8	4:2 FLUOROTELOMER SULFONATE	0.90	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	0.9	0.45	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N			0.45	1.8	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0.90	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	0.9	0.45	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N			0.45	1.8	9CL-PF3ONS	0.90	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Hexafluoropropylene oxide dimer acid (GenX)	1.8	0.91	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N			0.91	3.6	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	1.8	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	0.9	0.45	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N			0.45	1.8	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	0.90	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	0.9	0.45	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N			0.45	1.8	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	0.90	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUORODECANESULFONIC ACID (PFDS)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUORONONANESULFONIC ACID (PFNS)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROCTANE SULFONAMIDE (FOSA)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-butanoic acid (PFBA)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROBUTANOIC ACID (PFBA)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-decanoic acid (PFDA)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUORODECANOIC ACID (PFDA)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUORODODECANOIC ACID (PFDOA)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.46	0.18	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROHEPTANOIC ACID (PFHPA)	0.18	UG/KG	J	Y	P	Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.46	0.27	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROHEXANOIC ACID (PFHXA)	0.27	UG/KG	J	Y	P	Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-nonanoic acid (PFNA)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUORONONANOIC ACID (PFNA)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-octanoic acid (PFOA)	0.46	0.29	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PENTADECAFLUOROOCTANOIC ACID (PFOA)	0.29	UG/KG	J	Y	P	Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.46	0.44	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROPENTANOIC ACID (PFPEA)	0.44	UG/KG	J	Y	P	Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.46	0.18	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROUNDECANOIC ACID (PFUNA)	0.46	UG/KG	U	N		Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluorohexanesulfonic acid (PFHxS)	0.46	0.46	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROHEXANESULFONIC ACID (PFHXS)	0.46	UG/KG	J	Y	P	Y
WG20002-007	WG20002	NM	AOPC1-SB02-0.0.5	SO	Perfluorooctanesulfonic acid (PFOS)	0.46	11		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N			0.18	0.91	PERFLUOROCTANESULFONIC ACID (PFOS)	11	UG/KG		Y		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	% Solids	0	81.8		%	07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y		0	0	% SOLIDS	81.8	%		Y			Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N			0.58	2.3	11CL-PF3OUDS	1.2	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N			0.58	2.3	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	1.2	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N			0.58	2.3	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	1.2	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N			0.58	2.3	4:2 FLUOROTELOMER SULFONATE	1.2	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N			0.58	2.3	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.2	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N			0.58	2.3	9CL-PF3ONS	1.2	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.4	1.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N			1.2	4.7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	2.4	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N			0.58	2.3	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.2	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N			0.58	2.3	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1.2	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUORODECANESULFONIC ACID (PFDS)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUORONONANESULFONIC ACID (PFNS)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROCTANE SULFONAMIDE (FOSA)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-butanoic acid (PFBA)	0.6	0.47	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROBUTANOIC ACID (PFBA)	0.47	UG/KG	J	Y	P	Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-decanoic acid (PFDA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUORODECANOIC ACID (PFDA)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUORODODECANOIC ACID (PFDOA)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.6	0.52	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROHEPTANOIC ACID (PFHPA)	0.52	UG/KG	J	Y	P	Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.6	0.82	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROHEXANOIC ACID (PFHXA)	0.82	UG/KG	J	Y	P	Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-nonanoic acid (PFNA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUORONONANOIC ACID (PFNA)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-octanoic acid (PFOA)	0.6	7.1		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PENTADECAFLUOROOCTANOIC ACID (PFOA)	7.1	UG/KG		Y		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.6	0.85	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROPENTANOIC ACID (PFPEA)	0.85	UG/KG	J	Y	P	Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	19:28:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.2	PERFLUOROUNDECANOIC ACID (PFUNA)	0.60	UG/KG	U	N		Y
WG20002-008	WG20002	NM	AOPC1-SB02-0.5-2

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1	0.5	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		0.5	2	4:2 FLUOROTELOMER SULFONATE	1	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1	0.5	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		0.5	2	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1	0.5	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		0.5	2	9CL-PF3ONS	1	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Hexafluoropropylene oxide dimer acid (GenX)	2	1	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		1	4	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	2	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1	0.5	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		0.5	2	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1	0.5	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1		N		0.5	2	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.5	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.50	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.5	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUORODECANESULFONIC ACID (PFDS)	0.50	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.5	0.21	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.21	UG/KG	J	Y	P	Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.5	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUORONONANESULFONIC ACID (PFNS)	0.50	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.5	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.50	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.5	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.50	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-butanoic acid (PFBA)	0.5	0.36	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROBUTANOIC ACID (PFBA)	0.36	UG/KG	J	Y	P	Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-decanoic acid (PFDA)	0.5	0.54	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUORODECANOIC ACID (PFDA)	0.54	UG/KG	J	Y	P	Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.5	0.25	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUORODODECANOIC ACID (PFDOA)	0.25	UG/KG	J	Y	P	Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.5	1.6		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROHEPTANOIC ACID (PFHPA)	1.6	UG/KG		Y		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.5	3.1		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROHEXANOIC ACID (PFHXA)	3.1	UG/KG		Y		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-nonanoic acid (PFNA)	0.5	0.26	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUORONONANOIC ACID (PFNA)	0.26	UG/KG	J	Y	P	Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-octanoic acid (PFOA)	0.5	120		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PENTADECAFLUOROOCTANOIC ACID (PFOA)	120	UG/KG		Y		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.5	1		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROPENTANOIC ACID (PFPEA)	1	UG/KG		Y		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.5	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.50	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.5	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.50	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.5	0.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROUNDECANOIC ACID (PFUNA)	0.50	UG/KG	U	N		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluorohexanesulfonic acid (PFHxS)	0.5	5.8		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROHEXANESULFONIC ACID (PFHXS)	5.8	UG/KG		Y		Y
WG20002-011	WG20002	NM	ADPC1-SB04-0-0.5	SO	Perfluorooctanesulfonic acid (PFOS)	0.5	22		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:00:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1		N		0.2	1	PERFLUOROOCTANESULFONIC ACID (PFOS)	22	UG/KG		Y		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	% Solids	0	82.3		%	07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y			0	0	% SOLIDS	82.3	%		Y		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	11CL-PF3OUDS	1.1	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	1.1	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	1.1	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	4:2 FLUOROTELOMER SULFONATE	1.1	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.1	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	9CL-PF3ONS	1.1	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.2	1.1	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.3	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	2.2	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.1	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1.1	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORODECANESULFONIC ACID (PFDS)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORONONANESULFONIC ACID (PFNS)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-butanoic acid (PFBA)	0.55	1.1		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROBUTANOIC ACID (PFBA)	1.1	UG/KG		Y		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-decanoic acid (PFDA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORODECANOIC ACID (PFDA)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORODODECANOIC ACID (PFDOA)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.55	1.9		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEPTANOIC ACID (PFHPA)	1.9	UG/KG		Y		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.55	1.9		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEXANOIC ACID (PFHXA)	1.9	UG/KG		Y		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-nonanoic acid (PFNA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORONONANOIC ACID (PFNA)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-octanoic acid (PFOA)	0.55	45		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PENTADECAFLUOROOCTANOIC ACID (PFOA)	45	UG/KG		Y		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.55	1.9	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROPENTANOIC ACID (PFPEA)	1.9	UG/KG		Y		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROUNDECANOIC ACID (PFUNA)	0.55	UG/KG	U	N		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluorohexanesulfonic acid (PFHxS)	0.55	5.5		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEXANESULFONIC ACID (PFHXS)	5.5	UG/KG		Y		Y
WG20002-012	WG20002	NM	ADPC1-SB04-0.5-2	SO	Perfluorooctanesulfonic acid (PFOS)	0.55	6.2		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROOCTANESULFONIC ACID (PFOS)	6.2	UG/KG		Y		Y
WG20002-013	WG20002	NM	ADPC6-SB01-0-0.5	SO	% Solids	0	98.1		%	07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y			0	0	% SOLIDS	98.1	%		Y		Y
WG20002-013	WG20002	NM	ADPC6-SB01-0-0.5	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	0.85	0.43	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1		N		0.43	1.7	11CL-PF3OUDS	0.85	UG/KG	U	N		Y
WG20002-013	WG20002	NM	ADPC6-SB01-0-0.5	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	0.85	0.81	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1		N		0.43	1.7	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	0.81	UG/KG	J	Y	P	Y
WG20002-013	WG20002	NM	ADPC6-SB01-0-0.5	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	0.85	0.43	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1		N		0.43	1.7	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	0.85	UG/KG	U	N		Y
WG20002-013	WG20002	NM	ADPC6-SB01-0-0.5	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	0.85	0.43	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		0.43	1.7	4:2 FLUOROTELOMER SULFONATE	0.85	UG/KG	U	N		Y
WG20002-013	WG20002	NM	ADPC6-SB01-0-0.5	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	0.85	0.43	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		0.43	1.7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0.85	UG/KG	U	N		Y
WG20002-013	WG20002	NM	ADPC6-SB01-0-0.5	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	0.85	0.43	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		0.43	1.7	9CL-PF3ONS	0.85	UG/KG	U	N		Y
WG20002-013	WG20002	NM	ADPC6-SB01-0-0.5	SO	Hexafluoropropylene oxide dimer acid (GenX)	1.8	0.86	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	20:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		0.86	3.5	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	1.8	UG/KG	U	N		Y
WG20002-013	WG20002	NM	ADPC6-SB01-0-0.5	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	0.85	1.1	J	ug/kg	07/13/2021	07/25/2021	16:

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.55	0.54	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.54	UG/KG	J	Y	P	Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.55	0.28	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.28	UG/KG	J	Y	P	Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-butanoic acid (PFBA)	0.55	1.3		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROBUTANOIC ACID (PFBA)	1.3	UG/KG		Y		Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-decanoic acid (PFDA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORODECANOIC ACID (PFDA)	0.55	UG/KG	U	N		Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORODODECANOIC ACID (PFDOA)	0.55	UG/KG	U	N		Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.55	0.6	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEPTANOIC ACID (PFHPA)	0.6	UG/KG	J	Y	P	Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.55	1.3		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEXANOIC ACID (PFHXA)	1.3	UG/KG		Y		Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-nonanoic acid (PFNA)	0.55	0.67	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORONONANOIC ACID (PFNA)	0.67	UG/KG	J	Y	P	Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-octanoic acid (PFOA)	0.55	6.3		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PENTADECAFLUOROOCTANOIC ACID (PFOA)	6.3	UG/KG		Y		Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.55	0.65	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROPENTANOIC ACID (PFPEA)	0.65	UG/KG	J	Y	P	Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.55	UG/KG	U	N		Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.55	UG/KG	U	N		Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROUNDECANOIC ACID (PFUNA)	0.55	UG/KG	U	N		Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluorohexanesulfonic acid (PFHxS)	0.55	14		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEXANESULFONIC ACID (PFHXS)	14	UG/KG		Y		Y
WG20002-015	WG20002	NM	ADPC2-SB01-0-0.5	SO	Perfluorooctanesulfonic acid (PFOS)	0.55	41		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROOCTANESULFONIC ACID (PFOS)	41	UG/KG		Y		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	% Solids	0	84.1		%	07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y		0	0	0	% SOLIDS	84.1	%		Y		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1		N		0.58	2.3	11CL-PF3OUDS	1.2	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1		N		0.58	2.3	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	1.2	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1		N		0.58	2.3	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	1.2	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		0.58	2.3	4:2 FLUOROTELOMER SULFONATE	1.2	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		0.58	2.3	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.2	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		0.58	2.3	9CL-PF3ONS	1.2	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.4	1.2	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		1.2	4.7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	2.4	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		0.58	2.3	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.2	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1.2	0.58	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1		N		0.58	2.3	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1.2	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUORODECANESULFONIC ACID (PFDS)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.6	0.36	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.36	UG/KG	J	Y	P	Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUORONONANESULFONIC ACID (PFNS)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-butanoic acid (PFBA)	0.6	0.66	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROBUTANOIC ACID (PFBA)	0.66	UG/KG	J	Y	P	Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-decanoic acid (PFDA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUORODECANOIC ACID (PFDA)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUORODODECANOIC ACID (PFDOA)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROHEPTANOIC ACID (PFHPA)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.6	1.2		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROHEXANOIC ACID (PFHXA)	1.2	UG/KG		Y		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-nonanoic acid (PFNA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUORONONANOIC ACID (PFNA)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-octanoic acid (PFOA)	0.6	5.1		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PENTADECAFLUOROOCTANOIC ACID (PFOA)	5.1	UG/KG		Y		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.6	0.62	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROPENTANOIC ACID (PFPEA)	0.62	UG/KG	J	Y	P	Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.6	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROUNDECANOIC ACID (PFUNA)	0.60	UG/KG	U	N		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluorohexanesulfonic acid (PFHxS)	0.6	10		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROHEXANESULFONIC ACID (PFHXS)	10	UG/KG		Y		Y
WG20002-016	WG20002	NM	ADPC2-SB01-0-0.5-2	SO	Perfluorooctanesulfonic acid (PFOS)	0.6	12		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1		N		0.23	1.2	PERFLUOROOCTANESULFONIC ACID (PFOS)	12	UG/KG		Y		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	% Solids	0	86.9		%	07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y		0	0	0	% SOLIDS	86.9	%		Y		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	11CL-PF3OUDS	1.1	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	1.1	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	1.1	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	4:2 FLUOROTELOMER SULFONATE	1.1	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.1	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	9CL-PF3ONS	1.1	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.2	1.1	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.3	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	2.2	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.1	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1.1	0.53	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1.1	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.55	0.23	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.23	UG/KG	J	Y	P	Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORODECANESULFONIC ACID (PFDS)	0.55	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.55	0.44	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.44	UG/KG	J	Y	P	Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORONONANESULFONIC ACID (PFNS)	0.55	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.55	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.55	0.21	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.55	UG/KG	U	N		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	Perfluoro-n-butanoic acid (PFBA)	0.55	1.5		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROBUTANOIC ACID (PFBA)	1.5	UG/KG		Y		Y
WG20002-017	WG20002	NM	ADPC2-SB02-0-0.5	SO	Perfluoro-n-decanoic acid (PFDA)	0.55	0.29	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORODECANOIC ACID (PFDA)	0.29	UG

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG20002-019	WG20002	NM	ADPC2-SB03-0-0.5	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.6	0.25	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.25	1.2	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.60	UG/KG	U	N		Y
WG20002-019	WG20002	NM	ADPC2-SB03-0-0.5	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.6	0.25	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.25	1.2	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.60	UG/KG	U	N		Y
WG20002-019	WG20002	NM	ADPC2-SB03-0-0.5	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.6	0.25	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.25	1.2	PERFLUOROUNDECANOIC ACID (PFUNA)	0.60	UG/KG	U	N		Y
WG20002-019	WG20002	NM	ADPC2-SB03-0-0.5	SO	Perfluorohexanesulfonic acid (PFHxS)	0.6	1.2		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			0.25	1.2	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.2	UG/KG		Y		Y
WG20002-019	WG20002	NM	ADPC2-SB03-0-0.5	SO	Perfluorooctanesulfonic acid (PFOS)	0.6	4.2	S	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	21:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N			0.25	1.2	PERFLUOROOCTANESULFONIC ACID (PFOS)	4.2	UG/KG	J	Y	D	D	Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	% Solids	0	82.2		%	07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y		0	0	% SOLIDS	82.2	%		Y		Y	
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	1.2	0.6	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N			0.6	2.4	11CL-PF3OUDS	1.2	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	1.2	0.6	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N			0.6	2.4	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	1.2	UG/KG	UK	N	D	D	Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	1.2	0.6	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N			0.6	2.4	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	1.2	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1.2	0.6	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N			0.6	2.4	4:2 FLUOROTELOMER SULFONATE	1.2	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.2	0.6	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N			0.6	2.4	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.2	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.2	0.6	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N			0.6	2.4	9CL-PF3ONS	1.2	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.4	1.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N			1.2	4.8	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	2.4	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.2	0.6	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N			0.6	2.4	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.2	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1.2	0.6	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N			0.6	2.4	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1.2	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUORODECANESULFONIC ACID (PFDS)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUORONONANESULFONIC ACID (PFNS)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-butanoic acid (PFBA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROBUTANOIC ACID (PFBA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-decanoic acid (PFDA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUORODECANOIC ACID (PFDA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUORODODECANOIC ACID (PFDOA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROHEPTANOIC ACID (PFHPA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROHEXANOIC ACID (PFHXA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-nonanoic acid (PFNA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUORONONANOIC ACID (PFNA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-octanoic acid (PFOA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PENTADECAFLUOROOCTANOIC ACID (PFOA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROPENTANOIC ACID (PFPEA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROUNDECANOIC ACID (PFUNA)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluorohexanesulfonic acid (PFHxS)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROHEXANESULFONIC ACID (PFHXS)	0.60	UG/KG	U	N		Y
WG20002-020	WG20002	NM	ADPC2-SB03-0.5-2	SO	Perfluorooctanesulfonic acid (PFOS)	0.6	0.24	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N			0.24	1.2	PERFLUOROOCTANESULFONIC ACID (PFOS)	0.60	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	% Solids	0	78.8		%	07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y		0	0	% SOLIDS	78.8	%		Y		Y	
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	1.2	0.57	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N			0.57	2.3	11CL-PF3OUDS	1.2	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	1.2	0.57	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N			0.57	2.3	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	1.2	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	1.2	0.57	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N			0.57	2.3	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	1.2	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1.2	0.57	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N			0.57	2.3	4:2 FLUOROTELOMER SULFONATE	1.2	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.2	0.57	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N			0.57	2.3	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.2	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.2	0.57	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N			0.57	2.3	9CL-PF3ONS	1.2	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.3	1.1	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.5	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	2.3	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.2	0.57	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N			0.57	2.3	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.2	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1.2	0.57	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N			0.57	2.3	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1.2	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.55	0.54	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.54	UG/KG	J	Y	P	P	Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.55	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUORODECANESULFONIC ACID (PFDS)	0.55	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.55	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.55	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.55	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUORONONANESULFONIC ACID (PFNS)	0.55	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.55	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.55	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.55	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.55	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-butanoic acid (PFBA)	0.55	4.4		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROBUTANOIC ACID (PFBA)	4.4	UG/KG		Y		Y	
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-decanoic acid (PFDA)	0.55	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUORODECANOIC ACID (PFDA)	0.55	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.55	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUORODODECANOIC ACID (PFDOA)	0.55	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.55	0.76	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROHEPTANOIC ACID (PFHPA)	0.76	UG/KG	J	Y	P	P	Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.55	2.2		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROHEXANOIC ACID (PFHXA)	2.2	UG/KG		Y		Y	
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-nonanoic acid (PFNA)	0.55	0.25	J	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUORONONANOIC ACID (PFNA)	0.25	UG/KG	J	Y	P	P	Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-octanoic acid (PFOA)	0.55	4.2		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PENTADECAFLUOROOCTANOIC ACID (PFOA)	4.2	UG/KG		Y		Y	
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.55	1.5		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROPENTANOIC ACID (PFPEA)	1.5	UG/KG		Y		Y	
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.55	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.55	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.55	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.55	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.55	0.23	U	ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROUNDECANOIC ACID (PFUNA)	0.55	UG/KG	U	N		Y
WG20002-021	WG20002	NM	ADPC2-SB04-0-0.5	SO	Perfluorohexanesulfonic acid (PFHxS)	0.55	3.8		ug/kg	07/13/2021	07/25/2021	16:45:00	07/27/2021	22:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			0.23	1.1	PERFLUOROHEXANESULFONIC ACID (PFHXS)	3.8	UG/KG		Y		Y	
WG20002-021	WG

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.1	0.52	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		0.52	2.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.1	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.1	0.52	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		0.52	2.1	9CL-PF3ONS	1.1	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.1	1	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		1	4.2	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPPO-DA)	2.1	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.1	0.52	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		0.52	2.1	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.1	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1.1	0.52	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1		N		0.52	2.1	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1.1	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.5	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.50	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.5	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUORODECANESULFONIC ACID (PFDS)	0.50	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.5	0.41	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.41	UG/KG	J	Y	P	Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.5	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUORONONANESULFONIC ACID (PFNS)	0.50	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.5	0.27	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.27	UG/KG	J	Y	P	Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.5	0.31	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.31	UG/KG	J	Y	P	Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-butanoic acid (PFBA)	0.5	0.86	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROBUTANOIC ACID (PFBA)	0.86	UG/KG	J	Y	P	Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-decanoic acid (PFDA)	0.5	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUORODECANOIC ACID (PFDA)	0.50	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.5	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUORODODECANOIC ACID (PFDOA)	0.50	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.5	0.63	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROHEPTANOIC ACID (PFHPA)	0.63	UG/KG	J	Y	P	Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.5	1.2		ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROHEXANOIC ACID (PFHXA)	1.2	UG/KG	J	Y	P	Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-nonanoic acid (PFNA)	0.5	0.39	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUORONONANOIC ACID (PFNA)	0.39	UG/KG	J	Y	P	Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-octanoic acid (PFOA)	0.5	3.3		ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PENTADECAFLUOROOCTANOIC ACID (PFOA)	3.3	UG/KG		Y		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.5	0.69	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROPENTANOIC ACID (PFPEA)	0.69	UG/KG	J	Y	P	Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.5	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.50	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.5	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.50	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.5	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROUNDECANOIC ACID (PFUNA)	0.50	UG/KG	U	N		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluorohexanesulfonic acid (PFHxS)	0.5	14		ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROHEXANESULFONIC ACID (PFHXS)	14	UG/KG		Y		Y
WG20002-024	WG20002	NM	ADPC2-SB05-0.5-2	SO	Perfluorooctanesulfonic acid (PFOS)	0.5	21		ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:09:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1	PERFLUOROOCTANESULFONIC ACID (PFOS)	21	UG/KG		Y		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	% Solids	0	91.4	%		07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y		0	0	% SOLIDS	91.4	%		Y		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	1.1	0.53	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	11CL-PF3OUDS	1.1	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	1.1	0.53	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	1.1	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	1.1	0.53	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	1.1	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1.1	0.53	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	4:2 FLUOROTELOMER SULFONATE	1.1	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.1	0.53	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.1	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.1	0.53	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	9CL-PF3ONS	1.1	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.1	1.1	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.2	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPPO-DA)	2.1	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.1	0.53	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.1	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	N-methylperfluoro-1-octanesulfonamidoacetic a	1.1	0.53	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1		N		0.53	2.1	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	1.1	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-1-butanesulfonic acid (PFBS)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-1-decanesulfonic acid (PFDS)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORODECANESULFONIC ACID (PFDS)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-1-nonanesulfonic acid (PFNS)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORONONANESULFONIC ACID (PFNS)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-1-octanesulfonamide (PFOSA)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-butanoic acid (PFBA)	0.55	0.59	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROBUTANOIC ACID (PFBA)	0.59	UG/KG	J	Y	P	Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-decanoic acid (PFDA)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORODECANOIC ACID (PFDA)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORODODECANOIC ACID (PFDOA)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.55	1.1		ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEPTANOIC ACID (PFHPA)	1.1	UG/KG		Y		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.55	1	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEXANOIC ACID (PFHXA)	1	UG/KG	J	Y	P	Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-nonanoic acid (PFNA)	0.55	0.72	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUORONONANOIC ACID (PFNA)	0.72	UG/KG	J	Y	P	Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-octanoic acid (PFOA)	0.55	3.5		ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PENTADECAFLUOROOCTANOIC ACID (PFOA)	3.5	UG/KG		Y		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.55	0.63	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROPENTANOIC ACID (PFPEA)	0.63	UG/KG	J	Y	P	Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.55	0.21	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROUNDECANOIC ACID (PFUNA)	0.55	UG/KG	U	N		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluorohexanesulfonic acid (PFHxS)	0.55	1.5		ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.5	UG/KG		Y		Y
WG20002-025	WG20002	NM	ADPC2-SB06-0.0.5	SO	Perfluorooctanesulfonic acid (PFOS)	0.55	9.6		ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:20:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1		N		0.21	1.1	PERFLUOROOCTANESULFONIC ACID (PFOS)	9.6	UG/KG		Y		Y
WG20002-026	WG20002	NM	ADPC2-SB06-0.5-2	SO	% Solids	0	84.3	%		07/13/2021	07/20/2021	23:09:00	07/20/2021	23:09:00	MISC	%Solids SOP	Gen Prep	N		SURR	07/20/2021	PACE ANALYTICAL	1	Y		0	0	% SOLIDS	84.3	%		Y		Y
WG20002-026	WG20002	NM	ADPC2-SB06-0.5-2	SO	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	1.2	0.57	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1		N		0.57	2.3	11CL-PF3OUDS	1.2	UG/KG	U	N		Y
WG20002-026	WG20002	NM	ADPC2-SB06-0.5-2	SO	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	1.2	0.57	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1		N		0.57	2.3	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	1.2	UG/KG	U	N		Y
WG20002-026	WG20002	NM	ADPC2-SB06-0.5-2	SO	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	1.2	0.57	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1		N		0.57	2.3	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	1.2	UG/KG	U	N		Y
WG20002-026	WG20002	NM	ADPC2-SB06-0.5-2	SO	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	1.2	0.57	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		0.57	2.3	4:2 FLUOROTELOMER SULFONATE	1.2	UG/KG	U	N		Y
WG20002-026	WG20002	NM	ADPC2-SB06-0.5-2	SO	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.2	0.57	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		0.57	2.3	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	1.2	UG/KG	U	N		Y
WG20002-026	WG20002	NM	ADPC2-SB06-0.5-2	SO	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	1.2	0.57	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		0.57	2.3	9CL-PF3ONS	1.2	UG/KG	U	N		Y
WG20002-026	WG20002	NM	ADPC2-SB06-0.5-2	SO	Hexafluoropropylene oxide dimer acid (GenX)	2.3	1.1	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.6	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPPO-DA)	2.3	UG/KG	U	N		Y
WG20002-026	WG20002	NM	ADPC2-SB06-0.5-2	SO	N-ethylperfluoro-1-octanesulfonamidoacetic ac	1.2	0.57	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		0.57	2.3	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	1.2	UG/KG	U	N		Y
WG20002-026	WG20002	NM	ADPC2-SB06-0.5-2	SO

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-1-pentanesulfonic acid (PFPeS)	0.49	0.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUOROPENTANESULFONIC ACID (PFPES)	0.49	UG/KG	U	N		Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-butanoic acid (PFBA)	0.49	1.2		ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUOROBUTANOIC ACID (PFBA)	1.2	UG/KG		Y		Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-decanoic acid (PFDA)	0.49	0.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUORODECANOIC ACID (PFDA)	0.49	UG/KG	U	N		Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-dodecanoic acid (PFDoA)	0.49	0.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUORODODECANOIC ACID (PFDOA)	0.49	UG/KG	U	N		Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-heptanoic acid (PFHpA)	0.49	0.23	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUOROHEPTANOIC ACID (PFHPA)	0.23	UG/KG	J	Y	P	Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-hexanoic acid (PFHxA)	0.49	0.3	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUOROHEXANOIC ACID (PFHXA)	0.3	UG/KG	J	Y	P	Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-nonanoic acid (PFNA)	0.49	0.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUORONONANOIC ACID (PFNA)	0.49	UG/KG	U	N		Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-octanoic acid (PFOA)	0.49	0.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PENTADECAFLUOROOCTANOIC ACID (PFOA)	0.49	UG/KG	U	N		Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-pentanoic acid (PFPeA)	0.49	0.24	J	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUOROPENTANOIC ACID (PFPEA)	0.24	UG/KG	J	Y	P	Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-tetradecanoic acid (PFTeDA)	0.49	0.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUOROTETRADECANOIC ACID (PFTEA)	0.49	UG/KG	U	N		Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-tridecanoic acid (PFTrDA)	0.49	0.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUOROTRIDECANOIC ACID (PFTRIA)	0.49	UG/KG	U	N		Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluoro-n-undecanoic acid (PFUdA)	0.49	0.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUOROUNDECANOIC ACID (PFUNA)	0.49	UG/KG	U	N		Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluorohexanesulfonic acid (PFHxS)	0.49	0.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUOROHEXANESULFONIC ACID (PFHXS)	0.49	UG/KG	U	N		Y
WG20002-028	WG20002	NM	ADPC2-SB07-0.5-2	SO	Perfluorooctanesulfonic acid (PFOS)	0.49	0.2	U	ug/kg	07/13/2021	07/26/2021	20:46:00	07/28/2021	21:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1		N		0.2	0.98	PERFLUOROOCTANESULFONIC ACID (PFOS)	0.49	UG/KG	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	4	2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1		N		2	7.9	11CL-PF3OUDS	4	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4	2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1		N		2	7.9	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	4	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	4	2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1		N		2	7.9	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	4	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	4	2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		2	7.9	4:2 FLUOROTELOMER SULFONATE	4	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	4	2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		2	7.9	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	4	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	4	2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		2	7.9	9CL-PF3ONS	4	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Hexafluoropropylene oxide dimer acid (GenX)	4	2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		2	7.9	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	4	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	4	2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		2	7.9	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	4	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	4	2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1		N		2	7.9	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	4	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROBUTANESULFONIC ACID (PFBS)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUORODECANESULFONIC ACID (PFDS)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUORONONANESULFONIC ACID (PFNS)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROPENTANESULFONIC ACID (PFPES)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-butanoic acid (PFBA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROBUTANOIC ACID (PFBA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-decanoic acid (PFDA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUORODECANOIC ACID (PFDA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUORODODECANOIC ACID (PFDOA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROHEPTANOIC ACID (PFHPA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROHEXANOIC ACID (PFHXA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-nonanoic acid (PFNA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUORONONANOIC ACID (PFNA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-octanoic acid (PFOA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PENTADECAFLUOROOCTANOIC ACID (PFOA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-pentanoic acid (PFPeA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROPENTANOIC ACID (PFPEA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROTETRADECANOIC ACID (PFTEA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluoro-n-undecanoic acid (PFUdA)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROUNDECANOIC ACID (PFUNA)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluorohexanesulfonic acid (PFHxS)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROHEXANESULFONIC ACID (PFHXS)	2	NG/L	U	N		Y
WG20002-029	WG20002	NM	ERB-071321-S	AQ	Perfluorooctanesulfonic acid (PFOS)	2	0.99	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	15:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1		N		0.99	4	PERFLUOROOCTANESULFONIC ACID (PFOS)	2	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1		N		1.7	7	11CL-PF3OUDS	3.5	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1		N		1.7	7	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.5	NG/L	U	N	C	Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.5	47		ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1		N		1.7	7	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	47	NG/L		Y		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		1.7	7	4:2 FLUOROTELOMER SULFONATE	3.5	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		1.7	7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.5	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		1.7	7	9CL-PF3ONS	3.5	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		1.7	7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.5	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		1.7	7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.5	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1		N		1.7	7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.5	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	18		ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUOROBUTANESULFONIC ACID (PFBS)	18	NG/L		Y		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.87	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	4.2		ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	4.2	NG/L		Y		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.87	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.87	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	12		ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	12	NG/L		Y		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	73		ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUOROBUTANOIC ACID (PFBA)	73	NG/L		Y		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.87	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.87	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	42		ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	42	NG/L		Y		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	240		ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	240	NG/L		Y		Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	2.9	J	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PERFLUORONONANOIC ACID (PFNA)	2.9	NG/L	J	Y	P	Y
WG20004-001	WG20004	NM	ADPC18-11E02A-071221	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	34		ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	15:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.87	3.5	PENTADECAFLUOROOCTANOIC ACID

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	4.2	2.1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N		2.1	8.4	11CL-PF3OUDS	4.2	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4.2	2.1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N		2.1	8.4	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	4.2	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4.2	50		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N		2.1	8.4	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	50	NG/L		Y		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	4.2	2.1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N		2.1	8.4	4:2 FLUOROTELOMER SULFONATE	4.2	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	4.2	2.1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N		2.1	8.4	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	4.2	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	4.2	2.1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N		2.1	8.4	9CL-PF3ONS	4.2	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Hexafluoropropylene oxide dimer acid (GenX)	4.2	2.1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N		2.1	8.4	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	4.2	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	4.2	2.1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N		2.1	8.4	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	4.2	NG/L	UJ	N	N	Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	4.2	2.1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N		2.1	8.4	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	4.2	NG/L	UJ	N	N	Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2.1	5.8		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROBUTANESULFONIC ACID (PFBS)	5.8	NG/L		Y		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUORODECANESULFONIC ACID (PFDS)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUORONONANESULFONIC ACID (PFNS)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROPENTANESULFONIC ACID (PFPES)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-butanoic acid (PFBA)	2.1	48		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROBUTANOIC ACID (PFBA)	48	NG/L		Y		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-decanoic acid (PFDA)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUORODECANOIC ACID (PFDA)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUORODODECANOIC ACID (PFDOA)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2.1	7.9		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROHEPTANOIC ACID (PFHPA)	7.9	NG/L		Y		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2.1	8.4		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROHEXANOIC ACID (PFHXA)	8.4	NG/L		Y		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-nonanoic acid (PFNA)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUORONONANOIC ACID (PFNA)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-octanoic acid (PFOA)	2.1	110		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PENTADECAFLUOROOCTANOIC ACID (PFOA)	110	NG/L		Y		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-pentanoic acid (PFPeA)	2.1	7.6		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROPENTANOIC ACID (PFPEA)	7.6	NG/L		Y		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROTETRADECANOIC ACID (PFTEA)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluoro-n-undecanoic acid (PFUdA)	2.1	1	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROUNDECANOIC ACID (PFUNA)	2.1	NG/L	U	N		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluorohexanesulfonic acid (PFHxS)	2.1	16		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROHEXANESULFONIC ACID (PFHXS)	16	NG/L		Y		Y
WG20004-004	WG20004	NM	AOPC8-W11-2-071221	AQ	Perfluorooctanesulfonic acid (PFOS)	2.1	3	J	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	14:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N		1	4.2	PERFLUOROOCTANESULFONIC ACID (PFOS)	3	NG/L	J	Y	PQ	Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	37	19	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	10	N		19	74	11CL-PF3OUDS	37	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	37	20	J	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	10	N		19	74	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	20	NG/L	J	Y	P	Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	37	330		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	10	N		19	74	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	330	NG/L		Y		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	37	19	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	10	N		19	74	4:2 FLUOROTELOMER SULFONATE	37	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	37	19	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	10	N		19	74	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	37	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	37	19	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	10	N		19	74	9CL-PF3ONS	37	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Hexafluoropropylene oxide dimer acid (GenX)	37	19	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	10	N		19	74	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	37	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	37	19	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	10	N		19	74	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	37	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	37	19	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	10	N		19	74	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	37	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	19	490		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROBUTANESULFONIC ACID (PFBS)	490	NG/L		Y		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	19	9.3	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUORODECANESULFONIC ACID (PFDS)	19	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	19	91		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	91	NG/L		Y		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	19	9.3	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUORONONANESULFONIC ACID (PFNS)	19	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	19	9.3	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROOCTANE SULFONAMIDE (FOSA)	19	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	19	350		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROPENTANESULFONIC ACID (PFPES)	350	NG/L		Y		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-butanoic acid (PFBA)	19	150		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROBUTANOIC ACID (PFBA)	150	NG/L		Y		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-decanoic acid (PFDA)	19	9.3	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUORODECANOIC ACID (PFDA)	19	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	19	9.3	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUORODODECANOIC ACID (PFDOA)	19	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-heptanoic acid (PFHpA)	19	130		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROHEPTANOIC ACID (PFHPA)	130	NG/L		Y		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-hexanoic acid (PFHxA)	19	720		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROHEXANOIC ACID (PFHXA)	720	NG/L		Y		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-nonanoic acid (PFNA)	19	14	J	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUORONONANOIC ACID (PFNA)	14	NG/L	J	Y	P	Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-octanoic acid (PFOA)	19	170		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PENTADECAFLUOROOCTANOIC ACID (PFOA)	170	NG/L		Y		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-pentanoic acid (PFPeA)	19	320		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROPENTANOIC ACID (PFPEA)	320	NG/L		Y		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	19	9.3	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROTETRADECANOIC ACID (PFTEA)	19	NG/L	U	N		Y
WG20004-006	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	19	9.3	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROTRIDECANOIC ACID (PFTRIA)	19	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluoro-n-undecanoic acid (PFUdA)	19	9.3	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROUNDECANOIC ACID (PFUNA)	19	NG/L	U	N		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluorohexanesulfonic acid (PFHxS)	19	1600		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1600	NG/L		Y		Y
WG20005-005	WG20004	NM	AOPC6-WV4-18-071221	AQ	Perfluorooctanesulfonic acid (PFOS)	19	3300		ng/L	07/12/2021	07/23/2021	17:42:00	07/27/2021	15:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	10	N		9.3	37	PERFLUOROOCTANESULFONIC ACID (PFOS)	3300	NG/L		Y		Y
WG20004-006	WG20004	NM	FB-04-071221	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	17:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.9	11CL-PF3OUDS	3.5	NG/L	U	N		Y
WG20004-006	WG20004	NM	FB-04-071221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	17:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.9	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.5	NG/L	UJ	N	C	Y
WG20004-006	WG20004	NM	FB-04-071221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	17:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.9	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.5	NG/L	UJ	N		Y
WG20004-006	WG20004	NM	FB-04-071221	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	17:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.9	4:2 FLUOROTELOMER SULFONATE	3.5	NG/L	U	N		Y
WG20004-006	WG20004	NM	FB-04-071221	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	17:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.9	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.5	NG/L	U	N		Y
WG20004-006	WG20004	NM	FB-04-071221	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	17:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.9	9CL-PF3ONS	3.5	NG/L	U	N		Y
WG20004-006	WG20004	NM	FB-04-071221	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	17:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.9	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	3.5	NG/L	U	N		Y
WG20004-006	WG20004	NM	FB-04-071221	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.5	1.7	U	ng/L	07/12/2021	07/23/2021	17:42:00	07/26/2021	17:12:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	1.6	J	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.6	NG/L	J	Y	P	Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	2.8	J	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUOROBUTANOIC ACID (PFBA)	2.8	NG/L	J	Y	P	Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	1.6	J	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUOROHEXANOIC ACID (PFHXA)	1.6	NG/L	J	Y	P	Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUORONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	1.2	J	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.2	NG/L	J	Y	P	Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	1.8	J	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUOROPENTANOIC ACID (PFPEA)	1.8	NG/L	J	Y	P	Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	8.6		ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUOROHEXANESULFONIC ACID (PFHXS)	8.6	NG/L		Y		Y
WG20004-008	WG20004	NM	AOPC25-15B10A-071321	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	4.3		ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1		N		0.9	3.6	PERFLUOROOCTANESULFONIC ACID (PFOS)	4.3	NG/L		Y		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.9	1.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1		N		1.9	7.7	11CL-PF3OUDS	3.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.9	1.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1		N		1.9	7.7	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.9	NG/L	UJ	N	C	Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.9	9.6		ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1		N		1.9	7.7	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	9.6	NG/L		Y		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.9	1.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		1.9	7.7	4:2 FLUOROTELOMER SULFONATE	3.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.9	1.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		1.9	7.7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.9	1.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		1.9	7.7	9CL-PF3ONS	3.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.9	1.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		1.9	7.7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.9	1.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		1.9	7.7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.9	1.9	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1		N		1.9	7.7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.9	5.7		ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROBUTANESULFONIC ACID (PFBS)	5.7	NG/L		Y		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUORODECANESULFONIC ACID (PFDS)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUORONONANESULFONIC ACID (PFNS)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	2.7	J	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROPENTANESULFONIC ACID (PFPES)	2.7	NG/L	J	Y	P	Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	1.5	J	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROBUTANOIC ACID (PFBA)	1.5	NG/L	J	Y	P	Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROHEPTANOIC ACID (PFHPA)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROHEXANOIC ACID (PFHXA)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUORONONANOIC ACID (PFNA)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	1.1	J	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROPENTANOIC ACID (PFPEA)	1.1	NG/L	J	Y	P	Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.96	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	11		ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROHEXANESULFONIC ACID (PFHXS)	11	NG/L		Y		Y
WG20004-009	WG20004	NM	ADPC24-64A-071321	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	3.8		ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:44:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1		N		0.96	3.8	PERFLUOROOCTANESULFONIC ACID (PFOS)	3.8	NG/L		Y		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	4.4	2.2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1		N		2.2	8.8	11CL-PF3OUDS	4.4	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4.4	2.2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1		N		2.2	8.8	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	4.4	NG/L	UJ	N	C	Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4.4	4.9	J	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1		N		2.2	8.8	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	4.9	NG/L	J	Y	P	Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	4.4	2.2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1		N		2.2	8.8	4:2 FLUOROTELOMER SULFONATE	4.4	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	4.4	2.2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1		N		2.2	8.8	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	4.4	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	4.4	2.2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1		N		2.2	8.8	9CL-PF3ONS	4.4	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Hexafluoropropylene oxide dimer acid (GenX)	4.4	2.2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1		N		2.2	8.8	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	4.4	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	4.4	2.2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1		N		2.2	8.8	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	4.4	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	4.4	2.2	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1		N		2.2	8.8	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	4.4	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2.2	8.4		ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUOROBUTANESULFONIC ACID (PFBS)	8.4	NG/L		Y		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2.2	1.1	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUORODECANESULFONIC ACID (PFDS)	2.2	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2.2	1.1	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2.2	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2.2	1.1	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUORONONANESULFONIC ACID (PFNS)	2.2	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2.2	1.1	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2.2	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2.2	6.4		ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUOROPENTANESULFONIC ACID (PFPES)	6.4	NG/L		Y		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-n-butanoic acid (PFBA)	2.2	5		ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUOROBUTANOIC ACID (PFBA)	5	NG/L		Y		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-n-decanoic acid (PFDA)	2.2	1.1	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUORODECANOIC ACID (PFDA)	2.2	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2.2	1.1	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUORODODECANOIC ACID (PFDOA)	2.2	NG/L	U	N		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2.2	1.6	J	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUOROHEPTANOIC ACID (PFHPA)	1.6	NG/L	J	Y	P	Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2.2	7.2		ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1		N		1.1	4.4	PERFLUOROHEXANOIC ACID (PFHXA)	7.2	NG/L		Y		Y
WG20004-010	WG20004	NM	ADPC24-WU4-1-071321	AQ	Perfluoro-n-nonanoic acid (PFNA)	2.2	1.1	U	ng/L	07/13/2021	07/23/2021	17:42:00	07/26/2021	17:54:00	PFAS	PFAS by ID SO

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.9	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.7	11CL-PF3OUDS	3.9	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.9	27		ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.7	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	27	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.9	480		ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.7	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	480	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.9	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.7	4:2 FLUOROTELOMER SULFONATE	3.9	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.9	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.9	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.9	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.7	9CL-PF3ONS	3.9	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.9	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	3.9	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.9	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.9	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.9	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.9	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2	310		ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROBUTANESULFONIC ACID (PFBS)	310	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2	0.97	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUORODECANESULFONIC ACID (PFDS)	2	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2	720	Q	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	720	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2	50	Q	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUORONONANESULFONIC ACID (PFNS)	50	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2	23		ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROOCTANE SULFONAMIDE (FOSA)	23	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2	330		ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROPENTANESULFONIC ACID (PFPES)	330	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-n-butanoic acid (PFBA)	2	270		ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROBUTANOIC ACID (PFBA)	270	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-n-decanoic acid (PFDA)	2	2.7	J	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUORODECANOIC ACID (PFDA)	2.7	NG/L	J	Y	P	Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2	0.97	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUORODODECANOIC ACID (PFDOA)	2	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2	130		ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROHEPTANOIC ACID (PFHPA)	130	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-n-nonanoic acid (PFNA)	2	8.7	Q	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUORONONANOIC ACID (PFNA)	8.7	NG/L	J+	Y	N	Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-n-octanoic acid (PFOA)	2	250		ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PENTADECAFLUOROOCTANOIC ACID (PFOA)	250	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-n-pentanoic acid (PFPeA)	2	560		ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROPENTANOIC ACID (PFPEA)	560	NG/L				Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2	0.97	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROTETRADECANOIC ACID (PFTEA)	2	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	2	0.97	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2	NG/L	U	N		Y
WG20004-013	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluoro-n-undecanoic acid (PFUdA)	2	0.97	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/28/2021	20:52:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROUNDECANOIC ACID (PFUNA)	2	NG/L	U	N		Y
WG20004-013-DL	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluorohexanesulfonic acid (PFHxS)	200	1600		ng/L	07/14/2021	07/27/2021	13:32:00	08/03/2021	10:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	100	N			97	390	PERFLUOROHEXANOIC ACID (PFHXA)	1600	NG/L				Y
WG20004-013-DL	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluorohexanesulfonic acid (PFHxS)	200	3900		ng/L	07/14/2021	07/27/2021	13:32:00	08/03/2021	10:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	100	N			97	390	PERFLUOROHEXANESULFONIC ACID (PFHXS)	3900	NG/L				Y
WG20004-013-DL	WG20004	NM	AOPC5-14039A-071421	AQ	Perfluorooctanesulfonic acid (PFOS)	200	40000	B	ng/L	07/14/2021	07/27/2021	13:32:00	08/03/2021	10:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	100	N			97	390	PERFLUOROOCTANESULFONIC ACID (PFOS)	40000	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	4.2	2.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N			2.1	8.4	11CL-PF3OUDS	4.2	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	4.2	2.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N			2.1	8.4	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	4.2	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4.2	14	Q	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N			2.1	8.4	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	14	NG/L	J-	Y	N	Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	4.2	2.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N			2.1	8.4	4:2 FLUOROTELOMER SULFONATE	4.2	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	4.2	2.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N			2.1	8.4	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	4.2	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	4.2	2.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N			2.1	8.4	9CL-PF3ONS	4.2	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Hexafluoropropylene oxide dimer acid (GenX)	4.2	2.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N			2.1	8.4	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	4.2	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic a	4.2	2.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N			2.1	8.4	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	4.2	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	4.2	2.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N			2.1	8.4	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	4.2	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2.1	14		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROBUTANESULFONIC ACID (PFBS)	14	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2.1	1.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUORODECANESULFONIC ACID (PFDS)	2.1	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2.1	4.9		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	4.9	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2.1	1.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUORONONANESULFONIC ACID (PFNS)	2.1	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2.1	1.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2.1	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2.1	19		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROPENTANESULFONIC ACID (PFPES)	19	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-butanoic acid (PFBA)	2.1	45		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROBUTANOIC ACID (PFBA)	45	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-decanoic acid (PFDA)	2.1	5.5		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUORODECANOIC ACID (PFDA)	5.5	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2.1	1.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUORODODECANOIC ACID (PFDOA)	2.1	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2.1	51		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROHEPTANOIC ACID (PFHPA)	51	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2.1	54		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROHEXANOIC ACID (PFHXA)	54	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-nonanoic acid (PFNA)	2.1	11		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUORONONANOIC ACID (PFNA)	11	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-octanoic acid (PFOA)	2.1	62		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PENTADECAFLUOROOCTANOIC ACID (PFOA)	62	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-pentanoic acid (PFPeA)	2.1	56		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROPENTANOIC ACID (PFPEA)	56	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2.1	1.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROTETRADECANOIC ACID (PFTEA)	2.1	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	2.1	1.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2.1	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluoro-n-undecanoic acid (PFUdA)	2.1	1.1	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROUNDECANOIC ACID (PFUNA)	2.1	NG/L	U	N		Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluorohexanesulfonic acid (PFHxS)	2.1	180		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROHEXANESULFONIC ACID (PFHXS)	180	NG/L				Y
WG20004-014	WG20004	NM	AOPC3-W7-9-071421	AQ	Perfluorooctanesulfonic acid (PFOS)	2.1	160	B	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:27:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N			1.1	4.2	PERFLUOROOCTANESULFONIC ACID (PFOS)	160	NG/L				Y
WG20004-015	WG20004	NM	AOPC5-WNB-14-071421	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.8	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.5	11CL-PF3OUDS	3.8	NG/L	U	N		Y
WG20004-015	WG20004	NM	AOPC5-WNB-14-071421	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.8	18		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.5	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	18	NG/L				Y
WG20004-015	WG20004	NM	AOPC5-WNB-14-071421	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.8	130		ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.5	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	130	NG/L				Y
WG20004-015	WG20004	NM	AOPC5-WNB-14-071421	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.8	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.5	4:2 FLUOROTELOMER SULFONATE	3.8	NG/L	U	N		Y
WG20004-015	WG20004	NM	AOPC5-WNB-14-071421	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.8	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.5	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.8	NG/L	U	N		Y
WG20004-015	WG20004	NM	AOPC5-WNB-14-071421	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.8	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.5	9CL-PF3ONS	3.8	NG/L	U	N		Y
WG20004-015	WG20004	NM	AOPC5-WNB-14-071421	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.8	1.9	U	ng/L	07/14/2021	07/27/2021	13:32:00	07/30/2021	00:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N			1.9	7.5	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	3.8	NG/L	U	N		Y
WG20004-015	WG20004	NM	AOPC5-WNB-14-071421	AQ	N-ethylperfluoro-1-oct

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	7.8		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROPENTANESULFONIC ACID (PFPES)	7.8	NG/L		Y		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	4.2		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROBUTANOIC ACID (PFBA)	4.2	NG/L		Y		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.9	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.9	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	2.1	J	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEPTANOIC ACID (PFHPA)	2.1	NG/L	J	Y	P	Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	6		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEXANOIC ACID (PFHXA)	6	NG/L		Y		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.9	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	5.1		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PENTADECAFLUOROOCTANOIC ACID (PFOA)	5.1	NG/L		Y		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	4.7		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROPENTANOIC ACID (PFPEA)	4.7	NG/L		Y		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.9	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.9	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.9	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	34		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEXANESULFONIC ACID (PFHXS)	34	NG/L		Y		Y
WG20004-017	WG20004	NM	AOPC1,7-WU4-9-071521	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	18	B	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:34:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROOCTANESULFONIC ACID (PFOS)	18	NG/L		Y		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.7	1.8	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N			1.8	7.3	11CL-PF3OUDS	3.7	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.7	1.8	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N			1.8	7.3	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.7	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.7	1.8	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N			1.8	7.3	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.7	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.7	1.8	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N			1.8	7.3	4:2 FLUOROTELOMER SULFONATE	3.7	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.7	1.8	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N			1.8	7.3	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.7	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.7	1.8	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N			1.8	7.3	9CL-PF3ONS	3.7	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.7	1.8	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N			1.8	7.3	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.7	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.7	1.8	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N			1.8	7.3	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.7	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.7	1.8	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N			1.8	7.3	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.7	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.9	21	S	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROBUTANESULFONIC ACID (PFBS)	21	NG/L	J+	Y	D	Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.9	0.92	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUORODECANESULFONIC ACID (PFDS)	1.9	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	2.4	J	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2.4	NG/L	J	Y	P	Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	0.92	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUORONONANESULFONIC ACID (PFNS)	1.9	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	0.92	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.9	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	27		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROPENTANESULFONIC ACID (PFPES)	27	NG/L		Y		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	13		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROBUTANOIC ACID (PFBA)	13	NG/L		Y		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.92	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.92	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	7.4		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROHEPTANOIC ACID (PFHPA)	7.4	NG/L		Y		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	22		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROHEXANOIC ACID (PFHXA)	22	NG/L		Y		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.92	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUORONONANOIC ACID (PFNA)	1.9	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	38		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PENTADECAFLUOROOCTANOIC ACID (PFOA)	38	NG/L		Y		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	17		ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROPENTANOIC ACID (PFPEA)	17	NG/L		Y		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	0.92	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.9	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.92	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.92	U	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	250	S	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROHEXANESULFONIC ACID (PFHXS)	250	NG/L		Y		Y
WG20004-018	WG20004	NM	AOPC1,7-PZA1-SC-071521	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	110	B	ng/L	07/15/2021	07/27/2021	13:32:00	07/28/2021	21:45:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROOCTANESULFONIC ACID (PFOS)	110	NG/L		Y		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	4	2	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N		2	7.9	11CL-PF3OUDS	4	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4	2	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N		2	7.9	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	4	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	4	12		ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N		2	7.9	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	12	NG/L		Y		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	4	2	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N		2	7.9	4:2 FLUOROTELOMER SULFONATE	4	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	4	2	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N		2	7.9	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	4	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	4	2	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N		2	7.9	9CL-PF3ONS	4	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Hexafluoropropylene oxide dimer acid (GenX)	4	2	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N		2	7.9	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	4	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	4	2	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N		2	7.9	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	4	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	4	2	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N		2	7.9	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	4	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUOROBUTANESULFONIC ACID (PFBS)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUORODECANESULFONIC ACID (PFDS)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUORONONANESULFONIC ACID (PFNS)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUOROPENTANESULFONIC ACID (PFPES)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-n-butanoic acid (PFBA)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUOROBUTANOIC ACID (PFBA)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-n-decanoic acid (PFDA)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUORODECANOIC ACID (PFDA)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUORODODECANOIC ACID (PFDOA)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUOROHEPTANOIC ACID (PFHPA)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUOROHEXANOIC ACID (PFHXA)	2	NG/L	U	N		Y
WG20004-019	WG20004	NM	FB-07-071521	AQ	Perfluoro-n-nonanoic acid (PFNA)	2	0.99	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	15:50:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N		1	0.99	4	PERFLUORONONANOIC ACID (

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	11CL-PF3OUDS	3.4	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.4	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.4	2	J	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	2	NG/L	J	Y	PQ	Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	4:2 FLUOROTELOMER SULFONATE	3.4	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.4	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	9CL-PF3ONS	3.4	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.4	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.4	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.4	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUORODECANESULFONIC ACID (PFDS)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUORONONANESULFONIC ACID (PFNS)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-butanoic acid (PFBA)	1.7	1.4	J	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROBUTANOIC ACID (PFBA)	1.4	NG/L	J	Y	P	Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-decanoic acid (PFDA)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUORODECANOIC ACID (PFDA)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUORODODECANOIC ACID (PFDOA)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROHEPTANOIC ACID (PFHPA)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.7	1.1	J	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROHEXANOIC ACID (PFHXA)	1.1	NG/L	J	Y	P	Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUORONONANOIC ACID (PFNA)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-octanoic acid (PFOA)	1.7	4.1		ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PENTADECAFLUOROOCTANOIC ACID (PFOA)	4.1	NG/L		Y		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROPENTANOIC ACID (PFPEA)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.7	0.85	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROUNDECANOIC ACID (PFUNA)	1.7	NG/L	U	N		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.7	8.1		ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROHEXANESULFONIC ACID (PFHXS)	8.1	NG/L		Y		Y
WG20004-022	WG20004	NM	ADPC3-W19-2-071621	AQ	Perfluorooctanesulfonic acid (PFOS)	1.7	2.3	J	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N		0.85	3.4	PERFLUOROOCTANESULFONIC ACID (PFOS)	2.3	NG/L	J	Y	PQ	Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	11CL-PF3OUDS	3.4	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.4	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.4	12		ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	12	NG/L		Y		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	4:2 FLUOROTELOMER SULFONATE	3.4	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.4	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	9CL-PF3ONS	3.4	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.4	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.4	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.4	1.7	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/20/2021	PACE ANALYTICAL	1	N		1.7	6.8	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.4	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.7	0.87	J	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROBUTANESULFONIC ACID (PFBS)	0.87	NG/L	J	Y	P	Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUORODECANESULFONIC ACID (PFDS)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUORONONANESULFONIC ACID (PFNS)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-butanoic acid (PFBA)	1.7	2	J	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROBUTANOIC ACID (PFBA)	2	NG/L	J	Y	P	Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-decanoic acid (PFDA)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUORODECANOIC ACID (PFDA)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUORODODECANOIC ACID (PFDOA)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.7	1.4	J	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROHEPTANOIC ACID (PFHPA)	1.4	NG/L	J	Y	P	Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.7	1	J	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROHEXANOIC ACID (PFHXA)	1	NG/L	J	Y	P	Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUORONONANOIC ACID (PFNA)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-octanoic acid (PFOA)	1.7	4.6		ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PENTADECAFLUOROOCTANOIC ACID (PFOA)	4.6	NG/L		Y		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROPENTANOIC ACID (PFPEA)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.7	0.86	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.7	10		ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROUNDECANOIC ACID (PFUNA)	1.7	NG/L	U	N		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.7	57		ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROHEXANESULFONIC ACID (PFHXS)	10	NG/L		Y		Y
WG20004-023	WG20004	NM	ADPC3-W7-10-071621	AQ	Perfluorooctanesulfonic acid (PFOS)	1.7	57		ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N		0.86	3.4	PERFLUOROOCTANESULFONIC ACID (PFOS)	57	NG/L		Y		Y
WG20004-024	WG20004	NM	ADPC24-171A-071621	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.8	1.9	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/20/2021	PACE ANALYTICAL	1	N		1.9	7.5	11CL-PF3OUDS	3.8	NG/L	U	N		Y
WG20004-024	WG20004	NM	ADPC24-171A-071621	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.8	1.9	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/20/2021	PACE ANALYTICAL	1	N		1.9	7.5	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.8	NG/L	U	N		Y
WG20004-024	WG20004	NM	ADPC24-171A-071621	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.8	1.9	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/20/2021	PACE ANALYTICAL	1	N		1.9	7.5	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.8	NG/L	U	N		Y
WG20004-024	WG20004	NM	ADPC24-171A-071621	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.8	1.9	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/20/2021	PACE ANALYTICAL	1	N		1.9	7.5	4:2 FLUOROTELOMER SULFONATE	3.8	NG/L	U	N		Y
WG20004-024	WG20004	NM	ADPC24-171A-071621	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.8	1.9	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/20/2021	PACE ANALYTICAL	1	N		1.9	7.5	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.8	NG/L	U	N		Y
WG20004-024	WG20004	NM	ADPC24-171A-071621	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.8	1.9	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/20/2021	PACE ANALYTICAL	1	N		1.9	7.5	9CL-PF3ONS	3.8	NG/L	U	N		Y
WG20004-024	WG20004	NM	ADPC24-171A-071621	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.8	1.9	U	ng/L	07/16/2021	07/27/2021	16:19:00	07/28/2021	16:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROBUTANOIC ACID (PFBA)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROHEPTANOIC ACID (PFHPA)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROHEXANOIC ACID (PFHXA)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUORONONANOIC ACID (PFNA)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROPENTANOIC ACID (PFPEA)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.9	NG/L	UJ	N	N	Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.9	NG/L	U	N		Y
WG20004-026	WG20004	NM	FB-07-071621	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	0.96	U	ng/L	07/15/2021	07/27/2021	16:19:00	07/28/2021	17:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/20/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROOCTANESULFONIC ACID (PFOS)	1.9	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	11CL-PF3OUDS	3.7	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.7	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.7	43		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	43	NG/L		Y		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	4:2 FLUOROTELOMER SULFONATE	3.7	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.7	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	9CL-PF3ONS	3.7	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.7	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.7	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.7	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	40		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROBUTANESULFONIC ACID (PFBS)	40	NG/L		Y		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.91	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.94	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0.94	NG/L	J	Y	P	Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.91	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.91	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	34		ng/L	07/19/2021	07/27/2021	18:38:00	08/03/2021	17:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1	N			0.95	3.8	PERFLUOROPENTANESULFONIC ACID (PFPES)	34	NG/L		Y		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	12		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROBUTANOIC ACID (PFBA)	12	NG/L		Y		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.91	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.91	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	4.2		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROHEPTANOIC ACID (PFHPA)	4.2	NG/L		Y		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	21		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROHEXANOIC ACID (PFHXA)	21	NG/L		Y		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.91	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUORONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	11		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PENTADECAFLUOROOCTANOIC ACID (PFOA)	11	NG/L		Y		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	13		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROPENTANOIC ACID (PFPEA)	13	NG/L		Y		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.91	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.91	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.91	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	130		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROHEXANESULFONIC ACID (PFHXS)	130	NG/L		Y		Y
WG22011-001	WG22011	NM	AOPZ4-W89-1-071921	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	57		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:26:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/22/2021	PACE ANALYTICAL	1	N			0.91	3.6	PERFLUOROOCTANESULFONIC ACID (PFOS)	57	NG/L		Y		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	11CL-PF3OUDS	3.7	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.7	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.7	48		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	48	NG/L	J	Y	G	Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	4:2 FLUOROTELOMER SULFONATE	3.7	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.7	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	9CL-PF3ONS	3.7	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.7	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.7	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.7	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/22/2021	PACE ANALYTICAL	1	N			1.8	7.3	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.7	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.9	7.9		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROBUTANESULFONIC ACID (PFBS)	7.9	NG/L		Y		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.9	0.92	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUORODECANESULFONIC ACID (PFDS)	1.9	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	0.92	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.9	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	0.92	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUORONONANESULFONIC ACID (PFNS)	1.9	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	0.92	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.9	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	4.2		ng/L	07/19/2021	07/27/2021	18:38:00	08/03/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.7	PERFLUOROPENTANESULFONIC ACID (PFPES)	4.2	NG/L	J	Y	Q	Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	12		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROBUTANOIC ACID (PFBA)	12	NG/L		Y		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.92	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.92	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	0.92	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROHEPTANOIC ACID (PFHPA)	1.9	NG/L	U	N		Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	1.4	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUOROHEXANOIC ACID (PFHXA)	1.4	NG/L	J	Y	P	Y
WG22011-002	WG22011	NM	AOPC3-W7-3-071921	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.92	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	17:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1	N			0.92	3.7	PERFLUORONONANO

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.5	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1	N			1.8	7	11CL-PF3OUDS	3.5	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.5	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1	N			1.8	7	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.5	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.5	210		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1	N			1.8	7	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	210	NG/L		Y		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.5	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1	N			1.8	7	4:2 FLUOROTELOMER SULFONATE	3.5	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.5	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1	N			1.8	7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.5	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.5	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1	N			1.8	7	9CL-PF3ONS	3.5	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.5	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1	N			1.8	7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.5	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.5	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1	N			1.8	7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.5	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.5	1.8	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/22/2021	PACE ANALYTICAL	1	N			1.8	7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.5	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	7.6		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROBUTANESULFONIC ACID (PFBS)	7.6	NG/L		Y		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.88	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.88	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.8	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.88	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.93	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROOCTANE SULFONAMIDE (FOSA)	0.93	NG/L	J	Y	P	Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	3.2	JL	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	3.2	NG/L	J	Y	EP	Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	11		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROBUTANOIC ACID (PFBA)	11	NG/L		Y		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.88	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.88	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	2.1	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	2.1	NG/L	J	Y	P	Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	2.1	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	2.1	NG/L	J	Y	P	Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	1.6	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUORONONANOIC ACID (PFNA)	1.6	NG/L	J	Y	PQ	Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	17		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PENTADECAFLUOROOCTANOIC ACID (PFOA)	17	NG/L		Y		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	1.2	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROPENTANOIC ACID (PFPEA)	1.2	NG/L	J	Y	P	Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.88	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.88	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.88	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	36		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROHEXANESULFONIC ACID (PFHXS)	36	NG/L		Y		Y
WG22011-005	WG22011	NM	AOPC03-W7-13-071921	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	23		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/22/2021	PACE ANALYTICAL	1	N			0.88	3.5	PERFLUOROOCTANESULFONIC ACID (PFOS)	23	NG/L		Y		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.9	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.7	11CL-PF3OUDS	3.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.9	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.7	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.9	290		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.7	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	290	NG/L		Y		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.9	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.7	4:2 FLUOROTELOMER SULFONATE	3.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.9	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.9	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.7	9CL-PF3ONS	3.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	6.1	1		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	6.1	NG/L	J	Y	P	Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.9	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.9	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.9	13		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROBUTANESULFONIC ACID (PFBS)	13	NG/L		Y		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.9	0.96	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUORODECANESULFONIC ACID (PFDS)	1.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	1.4	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.4	NG/L	J	Y	P	Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	0.96	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUORONONANESULFONIC ACID (PFNS)	1.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	0.96	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	5.6	L	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROPENTANESULFONIC ACID (PFPES)	5.6	NG/L	J+	Y	E	Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	18		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROBUTANOIC ACID (PFBA)	18	NG/L		Y		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	1.2	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUORODECANOIC ACID (PFDA)	1.2	NG/L	J	Y	P	Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	1.4	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUORODODECANOIC ACID (PFDOA)	1.4	NG/L	J	Y	PQ	Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	2.9	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROHEPTANOIC ACID (PFHPA)	2.9	NG/L	J	Y	P	Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	3.3	J	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROHEXANOIC ACID (PFHXA)	3.3	NG/L	J	Y	P	Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.96	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUORONONANOIC ACID (PFNA)	1.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	15		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PENTADECAFLUOROOCTANOIC ACID (PFOA)	15	NG/L		Y		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	5.1		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROPENTANOIC ACID (PFPEA)	5.1	NG/L		Y		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	0.96	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.96	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.96	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	57		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROHEXANESULFONIC ACID (PFHXS)	57	NG/L		Y		Y
WG22011-006	WG22011	NM	AOPC03-UST-MW-02-071921	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	50		ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/22/2021	PACE ANALYTICAL	1	N			0.96	3.8	PERFLUOROOCTANESULFONIC ACID (PFOS)	50	NG/L		Y		Y
WG22011-007	WG22011	NM	AOPC21-W4-14-071921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.8	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.5	11CL-PF3OUDS	3.8	NG/L	U	N		Y
WG22011-007	WG22011	NM	AOPC21-W4-14-071921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.8	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.5	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.8	NG/L	U	N		Y
WG22011-007	WG22011	NM	AOPC21-W4-14-071921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.8	14	Q	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.5	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	14	NG/L	J+	Y	N	Y
WG22011-007	WG22011	NM	AOPC21-W4-14-071921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.8	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.5	4:2 FLUOROTELOMER SULFONATE	3.8	NG/L	U	N		Y
WG22011-007	WG22011	NM	AOPC21-W4-14-071921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.8	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.5	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.8	NG/L	U	N		Y
WG22011-007	WG22011	NM	AOPC21-W4-14-071921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.8	1.9	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.5	9CL-PF3ONS	3.8	NG/L	U	N		Y
WG22011-007	WG22011	NM	AOPC21-W4-

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROPENTANESULFONIC ACID (PFPES)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-butanoic acid (PFBA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROBUTANOIC ACID (PFBA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-decanoic acid (PFDA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUORODECANOIC ACID (PFDA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUORODODECANOIC ACID (PFDOA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROHEPTANOIC ACID (PFHPA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROHEXANOIC ACID (PFHXA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-nonanoic acid (PFNA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUORONONANOIC ACID (PFNA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-octanoic acid (PFOA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PENTADECAFLUOROOCTANOIC ACID (PFOA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-pentanoic acid (PFPeA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROPENTANOIC ACID (PFPEA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROTETRADECANOIC ACID (PFTEA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluoro-n-undecanoic acid (PFUdA)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROUNDECANOIC ACID (PFUNA)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluorohexanesulfonic acid (PFHxS)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROHEXANESULFONIC ACID (PFHXS)	2.6	NG/L	U	N		Y
WG22011-009	WG22011	NM	FB-09-071921	AQ	Perfluorooctanesulfonic acid (PFOS)	2.6	1.3	U	ng/L	07/19/2021	07/27/2021	16:19:00	07/28/2021	19:23:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/22/2021	PACE ANALYTICAL	1		N		1.3	5.1	PERFLUOROOCTANESULFONIC ACID (PFOS)	2.6	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.7	1.8	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1		N		1.8	7.4	11CL-PF3OUDS	3.7	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.7	1.8	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1		N		1.8	7.4	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.7	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	2.9	2.9	J	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1		N		1.8	7.4	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	2.9	NG/L	J	Y	P	Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.7	1.8	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1		N		1.8	7.4	4:2 FLUOROTELOMER SULFONATE	3.7	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.7	1.8	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1		N		1.8	7.4	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.7	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.7	1.8	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1		N		1.8	7.4	9CL-PF3ONS	3.7	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.7	1.8	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1		N		1.8	7.4	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.7	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.7	1.8	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1		N		1.8	7.4	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.7	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.7	1.8	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/22/2021	PACE ANALYTICAL	1		N		1.8	7.4	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.7	NG/L	U	N	C	Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.9	21		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROBUTANESULFONIC ACID (PFBS)	21	NG/L	U	Y		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.9	0.92	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUORODECANESULFONIC ACID (PFDS)	1.9	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	0.92	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.9	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	0.92	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUORONONANESULFONIC ACID (PFNS)	1.9	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	0.92	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.9	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	17		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROPENTANESULFONIC ACID (PFPES)	17	NG/L		Y		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	29		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROBUTANOIC ACID (PFBA)	29	NG/L		Y		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.92	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.92	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	6.2		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROHEPTANOIC ACID (PFHPA)	6.2	NG/L		Y		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	23		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROHEXANOIC ACID (PFHXA)	23	NG/L		Y		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.92	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUORONONANOIC ACID (PFNA)	1.9	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	32		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PENTADECAFLUOROOCTANOIC ACID (PFOA)	32	NG/L		Y		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	38		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROPENTANOIC ACID (PFPEA)	38	NG/L		Y		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	0.92	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.9	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.92	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.92	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	9.1		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROHEXANESULFONIC ACID (PFHXS)	110	NG/L		Y		Y
WG22011-010	WG22011	NM	AOPC9-W2-13-072021	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	9.1		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:25:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/22/2021	PACE ANALYTICAL	1		N		0.92	3.7	PERFLUOROOCTANESULFONIC ACID (PFOS)	9.1	NG/L		Y		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.9	1.9	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1		N		1.9	7.8	11CL-PF3OUDS	3.9	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.9	1.9	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1		N		1.9	7.8	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.9	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.9	12		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1		N		1.9	7.8	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	12	NG/L		Y		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.9	1.9	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1		N		1.9	7.8	4:2 FLUOROTELOMER SULFONATE	3.9	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.9	1.9	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1		N		1.9	7.8	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.9	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.9	1.9	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1		N		1.9	7.8	9CL-PF3ONS	3.9	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.9	1.9	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1		N		1.9	7.8	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.9	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.9	1.9	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1		N		1.9	7.8	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.9	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.9	1.9	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/22/2021	PACE ANALYTICAL	1		N		1.9	7.8	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.9	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2	31		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUOROBUTANESULFONIC ACID (PFBS)	31	NG/L		Y		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2	0.97	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUORODECANESULFONIC ACID (PFDS)	2	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2	1.1	J	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.1	NG/L	J	Y	P	Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2	0.97	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUORONONANESULFONIC ACID (PFNS)	2	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2	0.97	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2	8.9		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUOROPENTANESULFONIC ACID (PFPES)	8.9	NG/L		Y		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-n-butanoic acid (PFBA)	2	19		ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUOROBUTANOIC ACID (PFBA)	19	NG/L		Y		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-n-decanoic acid (PFDA)	2	0.97	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUORODECANOIC ACID (PFDA)	2	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2	0.97	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUORODODECANOIC ACID (PFDOA)	2	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2	2.6	J	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUOROHEPTANOIC ACID (PFHPA)	2.6	NG/L	J	Y	P	Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2	2.3	J	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUOROHEXANOIC ACID (PFHXA)	2.3	NG/L	J	Y	P	Y
WG22011-011	WG22011	NM	AOPC21-W6-5-072021	AQ	Perfluoro-n-nonanoic acid (PFNA)	2	0.97	U	ng/L	07/20/2021	07/28/2021	17:34:00	07/30/2021	19:36:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1		N		0.97	3.9	PERFLUORONONANOIC ACID (PFNA)	2	NG/L	U	N		Y
WG22011-011	WG22011	NM	AOPC21-W6-

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1	N		2	8	11CL-PF3OUDS	4	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1	N		2	8	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	4	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4	6	J	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1	N		2	8	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	6	NG/L	J	Y	P	Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1	N		2	8	4:2 FLUOROTELOMER SULFONATE	4	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1	N		2	8	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	4	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1	N		2	8	9CL-PF3ONS	4	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Hexafluoropropylene oxide dimer acid (GenX)	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1	N		2	8	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	4	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1	N		2	8	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	4	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/22/2021	PACE ANALYTICAL	1	N		2	8	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	4	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2	2.8	J	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROBUTANESULFONIC ACID (PFBS)	2.8	NG/L	J	Y	P	Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2	1	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUORODECANESULFONIC ACID (PFDS)	2	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2	1	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2	1	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUORONONANESULFONIC ACID (PFNS)	2	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2	1	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2	1	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROPENTANESULFONIC ACID (PFPES)	2	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-butanoic acid (PFBA)	2	8		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROBUTANOIC ACID (PFBA)	8	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-decanoic acid (PFDA)	2	1.7	J	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUORODECANOIC ACID (PFDA)	1.7	NG/L	J	Y	P	Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2	1	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUORODODECANOIC ACID (PFDOA)	2	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2	2.6	J	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROHEPTANOIC ACID (PFHPA)	2.6	NG/L	J	Y	P	Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2	14		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROHEXANOIC ACID (PFHXA)	14	NG/L				Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-nonanoic acid (PFNA)	2	1.2	J	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUORONONANOIC ACID (PFNA)	1.2	NG/L	J	Y	P	Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-octanoic acid (PFOA)	2	8.4		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/22/2021	PACE ANALYTICAL	1	N		1	4	PENTADECAFLUOROOCTANOIC ACID (PFOA)	8.4	NG/L				Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-pentanoic acid (PFPeA)	2	11		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROPENTANOIC ACID (PFPEA)	11	NG/L				Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2	1	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROTETRADECANOIC ACID (PFTEA)	2	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	2	1	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluoro-n-undecanoic acid (PFUdA)	2	1	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROUNDECANOIC ACID (PFUNA)	2	NG/L	U	N		Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluorohexanesulfonic acid (PFHxS)	2	1	J	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1	NG/L	J	Y	P	Y
WG22011-014	WG22011	NM	ADPC21-WUS-10-072021	AQ	Perfluorooctanesulfonic acid (PFOS)	2	3.5	J	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:43:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/22/2021	PACE ANALYTICAL	1	N		1	4	PERFLUOROOCTANESULFONIC ACID (PFOS)	3.5	NG/L	J	Y	P	Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1	N		2	7.9	11CL-PF3OUDS	4	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1	N		2	7.9	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	4	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4	60		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1	N		2	7.9	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	60	NG/L				Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1	N		2	7.9	4:2 FLUOROTELOMER SULFONATE	4	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1	N		2	7.9	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	4	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1	N		2	7.9	9CL-PF3ONS	4	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Hexafluoropropylene oxide dimer acid (GenX)	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1	N		2	7.9	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	4	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1	N		2	7.9	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	4	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	4	2	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/22/2021	PACE ANALYTICAL	1	N		2	7.9	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	4	NG/L	U	N	C	Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2	8.9		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROBUTANESULFONIC ACID (PFBS)	8.9	NG/L				Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2	0.98	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUORODECANESULFONIC ACID (PFDS)	2	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2	0.98	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2	0.98	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUORONONANESULFONIC ACID (PFNS)	2	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2	0.98	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2	0.98	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROPENTANESULFONIC ACID (PFPES)	2	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-butanoic acid (PFBA)	2	20		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROBUTANOIC ACID (PFBA)	20	NG/L				Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-decanoic acid (PFDA)	2	3.9		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUORODECANOIC ACID (PFDA)	3.9	NG/L				Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2	0.98	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUORODODECANOIC ACID (PFDOA)	2	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2	2.8	J	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROHEPTANOIC ACID (PFHPA)	2.8	NG/L	J	Y	P	Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2	13		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROHEXANOIC ACID (PFHXA)	13	NG/L				Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-nonanoic acid (PFNA)	2	1.9	J	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUORONONANOIC ACID (PFNA)	1.9	NG/L	J	Y	P	Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-octanoic acid (PFOA)	2	12		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PENTADECAFLUOROOCTANOIC ACID (PFOA)	12	NG/L				Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-pentanoic acid (PFPeA)	2	6.6		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROPENTANOIC ACID (PFPEA)	6.6	NG/L				Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2	0.98	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROTETRADECANOIC ACID (PFTEA)	2	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	2	0.98	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluoro-n-undecanoic acid (PFUdA)	2	0.98	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROUNDECANOIC ACID (PFUNA)	2	NG/L	U	N		Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluorohexanesulfonic acid (PFHxS)	2	3	J	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROHEXANESULFONIC ACID (PFHXS)	3	NG/L	J	Y	P	Y
WG22011-015	WG22011	NM	ADPC21-W4-6-072021	AQ	Perfluorooctanesulfonic acid (PFOS)	2	6.4		ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	12:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/22/2021	PACE ANALYTICAL	1	N		0.98	3.9	PERFLUOROOCTANESULFONIC ACID (PFOS)	6.4	NG/L				Y
WG22011-016	WG22011	NM	FB-10-072021	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	13:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1	N		1.8	7.2	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG22011-016	WG22011	NM	FB-10-072021	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	1.8	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	13:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1	N		1.8	7.2	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG22011-016	WG22011	NM	FB-10-072021	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	1.8	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	13:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1	N		1.8	7.2	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.6	NG/L	U	N		Y
WG22011-016	WG22011	NM	FB-10-072021	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	13:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1	N		1.8	7.2	4:2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG22011-016	WG22011	NM	FB-10-072021	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	13:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1	N		1.8	7.2	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG22011-016	WG22011	NM	FB-10-072021	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	13:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1	N		1.8	7.2	9CL-PF3ONS	3.6	NG/L	U	N		Y
WG22011-016	WG22011	NM	FB-10-072021	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.6	1.8	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	13:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1	N		1.8	7.2	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.6	NG/L	U	N		Y
WG22011-016	WG22011	NM	FB-10-072021	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.6	1.8	U	ng/L	07/20/2021	07/29/2021	11:00:00	08/03/2021	13:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1	N		1.8	7.2	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.6	NG/L	U	N		Y
WG22011-016	WG22011	NM	FB-10-072021	AQ	N-methylper

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.7	2.7	J	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROPENTANESULFONIC ACID (PFPES)	2.7	NG/L	J	Y	P	Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-butanoic acid (PFBA)	1.7	11		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROBUTANOIC ACID (PFBA)	11	NG/L		Y		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-decanoic acid (PFDA)	1.7	0.86	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUORODECANOIC ACID (PFDA)	1.7	NG/L	U	N		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.7	0.86	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUORODODECANOIC ACID (PFDOA)	1.7	NG/L	U	N		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.7	4.6		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROHEPTANOIC ACID (PFHPA)	4.6	NG/L		Y		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.7	9.2		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROHEXANOIC ACID (PFHXA)	9.2	NG/L		Y		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.7	0.86	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUORONONANOIC ACID (PFNA)	1.7	NG/L	U	N		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-octanoic acid (PFOA)	1.7	41		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PENTADECAFLUOROOCTANOIC ACID (PFOA)	41	NG/L		Y		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.7	7.7		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROPENTANOIC ACID (PFPEA)	7.7	NG/L		Y		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.7	0.86	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.7	NG/L	U	N		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.7	0.86	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.7	NG/L	U	N		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.7	0.86	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROUNDECANOIC ACID (PFUNA)	1.7	NG/L	U	N		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.7	37		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROHEXANESULFONIC ACID (PFHXS)	37	NG/L		Y		Y
WG22011-018	WG22011	NM	AOPC10-WGC2-8-072121	AQ	Perfluorooctanesulfonic acid (PFOS)	1.7	53		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:47:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/22/2021	PACE ANALYTICAL	1	N			0.86	3.4	PERFLUOROOCTANESULFONIC ACID (PFOS)	53	NG/L		Y		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.9	1.9	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.8	11CL-PF3OUDS	3.9	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.9	1.9	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.8	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.9	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.9	1.9	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.8	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.9	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.9	1.9	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.8	4:2 FLUOROTELOMER SULFONATE	3.9	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.9	1.9	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.8	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.9	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.9	1.9	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.8	9CL-PF3ONS	3.9	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.9	1.9	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.8	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.9	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.9	1.9	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.8	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.9	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.9	1.9	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/22/2021	PACE ANALYTICAL	1	N			1.9	7.8	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.9	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2	29		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROBUTANESULFONIC ACID (PFBS)	29	NG/L		Y		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2	0.97	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUORODECANESULFONIC ACID (PFDS)	2	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2	0.97	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2	0.97	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUORONONANESULFONIC ACID (PFNS)	2	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2	0.97	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2	5.1		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROPENTANESULFONIC ACID (PFPES)	5.1	NG/L		Y		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-butanoic acid (PFBA)	2	59	Q	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROBUTANOIC ACID (PFBA)	59	NG/L	J+	Y	N	Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-decanoic acid (PFDA)	2	0.97	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUORODECANOIC ACID (PFDA)	2	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2	0.97	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUORODODECANOIC ACID (PFDOA)	2	NG/L	UJ	N	N	Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2	16		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROHEPTANOIC ACID (PFHPA)	16	NG/L		Y		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2	48		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROHEXANOIC ACID (PFHXA)	48	NG/L		Y		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-nonanoic acid (PFNA)	2	2.7	J	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUORONONANOIC ACID (PFNA)	2.7	NG/L	J	Y	P	Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-octanoic acid (PFOA)	2	24		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PENTADECAFLUOROOCTANOIC ACID (PFOA)	24	NG/L		Y		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-pentanoic acid (PFPeA)	2	41		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROPENTANOIC ACID (PFPEA)	41	NG/L		Y		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2	0.97	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROTETRADECANOIC ACID (PFTEA)	2	NG/L	UJ	N	N	Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	2	0.97	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluoro-n-undecanoic acid (PFUdA)	2	0.97	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROUNDECANOIC ACID (PFUNA)	2	NG/L	U	N		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluorohexanesulfonic acid (PFHxS)	2	26		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROHEXANESULFONIC ACID (PFHXS)	26	NG/L		Y		Y
WG22011-019	WG22011	NM	AOPC10-WGC2-10-072121	AQ	Perfluorooctanesulfonic acid (PFOS)	2	9.1		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	13:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/22/2021	PACE ANALYTICAL	1	N			0.97	3.9	PERFLUOROOCTANESULFONIC ACID (PFOS)	9.1	NG/L		Y		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	4	2	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/22/2021	PACE ANALYTICAL	1	N			2	7.9	11CL-PF3OUDS	4	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	4	2	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/22/2021	PACE ANALYTICAL	1	N			2	7.9	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	4	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4	4.4	J	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/22/2021	PACE ANALYTICAL	1	N			2	7.9	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	4.4	NG/L	J	Y	P	Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	4	2	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/22/2021	PACE ANALYTICAL	1	N			2	7.9	4:2 FLUOROTELOMER SULFONATE	4	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	4	2	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/22/2021	PACE ANALYTICAL	1	N			2	7.9	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	4	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	4	2	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/22/2021	PACE ANALYTICAL	1	N			2	7.9	9CL-PF3ONS	4	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Hexafluoropropylene oxide dimer acid (GenX)	4	2	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/22/2021	PACE ANALYTICAL	1	N			2	7.9	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	4	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	4	2	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/22/2021	PACE ANALYTICAL	1	N			2	7.9	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	4	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	4	2	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/22/2021	PACE ANALYTICAL	1	N			2	7.9	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	4	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2	18		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROBUTANESULFONIC ACID (PFBS)	18	NG/L		Y		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2	0.98	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUORODECANESULFONIC ACID (PFDS)	2	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2	0.98	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2	0.98	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUORONONANESULFONIC ACID (PFNS)	2	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2	0.98	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROOCTANE SULFONAMIDE (FOSA)	2	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2	7.5		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROPENTANESULFONIC ACID (PFPES)	7.5	NG/L		Y		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-n-butanoic acid (PFBA)	2	19		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROBUTANOIC ACID (PFBA)	19	NG/L		Y		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-n-decanoic acid (PFDA)	2	0.98	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUORODECANOIC ACID (PFDA)	2	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2	0.98	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUORODODECANOIC ACID (PFDOA)	2	NG/L	U	N		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2	2.6	J	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROHEPTANOIC ACID (PFHPA)	2.6	NG/L	J	Y	P	Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2	8.4		ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/22/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROHEXANOIC ACID (PFHXA)	8.4	NG/L		Y		Y
WG22011-020	WG22011	NM	AOPC10-WGC2-1-072121	AQ	Perfluoro-n-nonanoic acid (PFNA)	2	0.98	U	ng/L	07/21/2021	07/29/2021	11:00:00	08/03/2021	14:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/22/2021	PACE ANALYTICAL	1	N			0.98

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	200	100	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/24/2021	PACE ANALYTICAL	50	N		100	400	11CL-PF3OUDS	200	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	200	100	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/24/2021	PACE ANALYTICAL	50	N		100	400	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	200	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	200	4300		ng/L	07/22/2021	07/29/2021	10:48:00	08/05/2021	20:30:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/24/2021	PACE ANALYTICAL	50	N		100	400	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	4300	NG/L		Y		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	200	100	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/24/2021	PACE ANALYTICAL	50	N		100	400	4:2 FLUOROTELOMER SULFONATE	200	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	200	100	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/24/2021	PACE ANALYTICAL	50	N		100	400	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	200	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	200	100	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/24/2021	PACE ANALYTICAL	50	N		100	400	9CL-PF3ONS	200	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Hexafluoropropylene oxide dimer acid (GenX)	200	100	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/24/2021	PACE ANALYTICAL	50	N		100	400	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	200	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	200	100	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/24/2021	PACE ANALYTICAL	50	N		100	400	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	200	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	200	100	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/24/2021	PACE ANALYTICAL	50	N		100	400	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	200	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	100	310		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROBUTANESULFONIC ACID (PFBS)	310	NG/L		Y		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	100	50	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUORODECANESULFONIC ACID (PFDS)	100	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	100	180	J	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	180	NG/L	J	Y	P	Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	100	50	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUORONONANESULFONIC ACID (PFNS)	100	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	100	50	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROOCTANE SULFONAMIDE (FOSA)	100	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	100	330		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROPENTANESULFONIC ACID (PFPES)	330	NG/L		Y		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-butanoic acid (PFBA)	100	260		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROBUTANOIC ACID (PFBA)	260	NG/L		Y		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-decanoic acid (PFDA)	100	50	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUORODECANOIC ACID (PFDA)	100	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	100	50	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUORODODECANOIC ACID (PFDOA)	100	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-heptanoic acid (PFHpA)	100	160	J	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROHEPTANOIC ACID (PFHPA)	160	NG/L	J	Y	P	Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-hexanoic acid (PFHxA)	100	1600		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROHEXANOIC ACID (PFHXA)	1600	NG/L		Y		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-nonanoic acid (PFNA)	100	50	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUORONONANOIC ACID (PFNA)	100	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-octanoic acid (PFOA)	100	330		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/24/2021	PACE ANALYTICAL	50	N		50	200	PENTADECAFLUOROOCTANOIC ACID (PFOA)	330	NG/L		Y		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-pentanoic acid (PFPeA)	100	620		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROPENTANOIC ACID (PFPEA)	620	NG/L		Y		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	100	50	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROTETRADECANOIC ACID (PFTEA)	100	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	100	50	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROTRIDECANOIC ACID (PFTRIA)	100	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluoro-n-undecanoic acid (PFUdA)	100	50	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROUNDECANOIC ACID (PFUNA)	100	NG/L	U	N		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluorohexanesulfonic acid (PFHxS)	100	2600		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROHEXANESULFONIC ACID (PFHXS)	2600	NG/L		Y		Y
WG24008-002	WG24008	NM	ADPC13-SW01-IN-072221	AQ	Perfluorooctanesulfonic acid (PFOS)	100	6800		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/24/2021	PACE ANALYTICAL	50	N		50	200	PERFLUOROOCTANESULFONIC ACID (PFOS)	6800	NG/L		Y		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/24/2021	PACE ANALYTICAL	1	N		1.8	7.1	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	1.8	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/24/2021	PACE ANALYTICAL	1	N		1.8	7.1	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	1.8	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/24/2021	PACE ANALYTICAL	1	N		1.8	7.1	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.6	NG/L	U	N	C	Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/24/2021	PACE ANALYTICAL	1	N		1.8	7.1	4:2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/24/2021	PACE ANALYTICAL	1	N		1.8	7.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/24/2021	PACE ANALYTICAL	1	N		1.8	7.1	9CL-PF3ONS	3.6	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.6	1.8	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/24/2021	PACE ANALYTICAL	1	N		1.8	7.1	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.6	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.6	1.8	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/24/2021	PACE ANALYTICAL	1	N		1.8	7.1	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.6	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.6	1.8	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/24/2021	PACE ANALYTICAL	1	N		1.8	7.1	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.6	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROBUTANOIC ACID (PFBA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUORONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROPENTANOIC ACID (PFPEA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	0.88	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.8	NG/L	U	N		Y
WG24008-003	WG24008	NM	ADPC13-SW01-IT-072221	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	2.5	J	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	16:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/24/2021	PACE ANALYTICAL	1	N		0.88	3.5	PERFLUOROOCTANESULFONIC ACID (PFOS)	2.5	NG/L	J	Y	P	Y
WG24008-004	WG24008	FD	ADPC13-SW01-IT-072221-FD	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	17:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/24/2021	PACE ANALYTICAL	1	N		1.9	7.5	11CL-PF3OUDS	3.8	NG/L	U	N		Y
WG24008-004	WG24008	FD	ADPC13-SW01-IT-072221-FD	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	17:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/24/2021	PACE ANALYTICAL	1	N		1.9	7.5	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.8	NG/L	U	N		Y
WG24008-004	WG24008	FD	ADPC13-SW01-IT-072221-FD	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	17:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/24/2021	PACE ANALYTICAL	1	N		1.9	7.5	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.8	NG/L	U	N	C	Y
WG24008-004	WG24008	FD	ADPC13-SW01-IT-072221-FD	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	17:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/24/2021	PACE ANALYTICAL	1	N		1.9	7.5	4:2 FLUOROTELOMER SULFONATE	3.8	NG/L	U	N		Y
WG24008-004	WG24008	FD	ADPC13-SW01-IT-072221-FD	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	17:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/24/2021	PACE ANALYTICAL	1	N		1.9	7.5	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.8	NG/L	U	N		Y
WG24008-004	WG24008	FD	ADPC13-SW01-IT-072221-FD	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	17:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/24/2021	PACE ANALYTICAL	1	N		1.9	7.5	9CL-PF3ONS	3.8	NG/L	U	N		Y
WG24008-004	WG24008	FD	ADPC13-SW01-IT-072221-FD	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	17:04:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/24/2021	PACE ANALYTICAL	1	N		1.9	7.5	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.8	NG/L	U	N		Y
WG

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	8.3		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROPENTANESULFONIC ACID (PFPES)	8.3	NG/L		Y		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	9.7		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROBUTANOIC ACID (PFBA)	9.7	NG/L		Y		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.93	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.93	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	6.4		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROHEPTANOIC ACID (PFHPA)	6.4	NG/L		Y		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	20		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROHEXANOIC ACID (PFHXA)	20	NG/L		Y		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.93	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLURONONANOIC ACID (PFNA)	1.9	NG/L	U	N		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	17		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PENTADECAFLUOROOCTANOIC ACID (PFOA)	17	NG/L		Y		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	19		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROPENTANOIC ACID (PFPEA)	19	NG/L		Y		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	0.93	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.9	NG/L	U	N		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.93	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.93	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	48		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROHEXANESULFONIC ACID (PFHXS)	48	NG/L		Y		Y
WG24008-006	WG24008	NM	AOPC15-SW01-IN-072321	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	47		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:40:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/24/2021	PACE ANALYTICAL	1	N			0.93	3.7	PERFLUOROOCTANESULFONIC ACID (PFOS)	47	NG/L		Y		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.7	11CL-PF3OUDS	3.4	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.7	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.4	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.4	79		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.7	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	79	NG/L		Y		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.7	4:2 FLUOROTELOMER SULFONATE	3.4	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.4	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.7	9CL-PF3ONS	3.4	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.4	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.4	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.4	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.7	7.9		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROBUTANESULFONIC ACID (PFBS)	7.9	NG/L		Y		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUORODECANESULFONIC ACID (PFDS)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLURONONANESULFONIC ACID (PFNS)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.7	4.4		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROPENTANESULFONIC ACID (PFPES)	4.4	NG/L		Y		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-butanoic acid (PFBA)	1.7	3.5		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROBUTANOIC ACID (PFBA)	3.5	NG/L		Y		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-decanoic acid (PFDA)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUORODECANOIC ACID (PFDA)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUORODODECANOIC ACID (PFDOA)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROHEPTANOIC ACID (PFHPA)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROHEXANOIC ACID (PFHXA)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLURONONANOIC ACID (PFNA)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-octanoic acid (PFOA)	1.7	1.9	J	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.9	NG/L	J	Y	P	Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROPENTANOIC ACID (PFPEA)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.7	0.84	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROUNDECANOIC ACID (PFUNA)	1.7	NG/L	U	N		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.7	38		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROHEXANESULFONIC ACID (PFHXS)	38	NG/L		Y		Y
WG24009-001	WG24009	NM	AOPC22-10IDA2-072221	AQ	Perfluorooctanesulfonic acid (PFOS)	1.7	15		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	19:59:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/24/2021	PACE ANALYTICAL	1	N			0.84	3.4	PERFLUOROOCTANESULFONIC ACID (PFOS)	15	NG/L	J	Y	G	Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.8	11CL-PF3OUDS	3.4	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.8	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.4	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.4	66		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.8	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	66	NG/L		Y		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.8	4:2 FLUOROTELOMER SULFONATE	3.4	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.8	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.4	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.8	9CL-PF3ONS	3.4	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.8	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.4	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.8	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.4	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.4	1.7	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/24/2021	PACE ANALYTICAL	1	N			1.7	6.8	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.4	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.7	7.6		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLUOROBUTANESULFONIC ACID (PFBS)	7.6	NG/L		Y		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.7	0.85	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLUORODECANESULFONIC ACID (PFDS)	1.7	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.7	0.85	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.7	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.7	0.85	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLURONONANESULFONIC ACID (PFNS)	1.7	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.7	0.85	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.7	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.7	4.6		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLUOROPENTANESULFONIC ACID (PFPES)	4.6	NG/L		Y		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-n-butanoic acid (PFBA)	1.7	3.4		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLUOROBUTANOIC ACID (PFBA)	3.4	NG/L		Y		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-n-decanoic acid (PFDA)	1.7	0.85	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLUORODECANOIC ACID (PFDA)	1.7	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.7	0.85	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLUORODODECANOIC ACID (PFDOA)	1.7	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.7	0.85	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLUOROHEPTANOIC ACID (PFHPA)	1.7	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.7	0.85	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:10:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/24/2021	PACE ANALYTICAL	1	N			0.85	3.4	PERFLUOROHEXANOIC ACID (PFHXA)	1.7	NG/L	U	N		Y
WG24009-002	WG24009	FD	AOPC22-10IDA2-072221-FD	AQ	Perfluoro-

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/24/2021	PACE ANALYTICAL	1	N			1.9	7.5	11CL-PF3OUDS	3.8	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/24/2021	PACE ANALYTICAL	1	N			1.9	7.5	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	3.8	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/24/2021	PACE ANALYTICAL	1	N			1.9	7.5	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	3.8	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/24/2021	PACE ANALYTICAL	1	N			1.9	7.5	4-2 FLUOROTELOMER SULFONATE	3.8	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/24/2021	PACE ANALYTICAL	1	N			1.9	7.5	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.8	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/24/2021	PACE ANALYTICAL	1	N			1.9	7.5	9CL-PF3ONS	3.8	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/24/2021	PACE ANALYTICAL	1	N			1.9	7.5	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	3.8	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/24/2021	PACE ANALYTICAL	1	N			1.9	7.5	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.8	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.8	1.9	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/24/2021	PACE ANALYTICAL	1	N			1.9	7.5	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.8	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.9	11		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROBUTANESULFONIC ACID (PFBS)	11	NG/L		Y		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUORODECANESULFONIC ACID (PFDS)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUORONONANESULFONIC ACID (PFNS)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	4.6		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROPENTANESULFONIC ACID (PFPES)	4.6	NG/L		Y		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	22		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROBUTANOIC ACID (PFBA)	22	NG/L		Y		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROHEPTANOIC ACID (PFHPA)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROHEXANOIC ACID (PFHXA)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUORONONANOIC ACID (PFNA)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	1.5	J	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.5	NG/L	J	Y	P	Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROPENTANOIC ACID (PFPEA)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.94	U	ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	56		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROHEXANESULFONIC ACID (PFHXS)	56	NG/L		Y		Y
WG24009-005	WG24009	NM	AOPC22-10I01A-072221	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	15		ng/L	07/22/2021	07/29/2021	10:48:00	07/31/2021	20:42:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/24/2021	PACE ANALYTICAL	1	N			0.94	3.7	PERFLUOROOCTANESULFONIC ACID (PFOS)	15	NG/L		Y		Y
WG24009-006	WG24009	NM	AOPC22-10I01A-072221	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	370	180	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/24/2021	PACE ANALYTICAL	100	N			180	730	11CL-PF3OUDS	370	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	370	180	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/24/2021	PACE ANALYTICAL	100	N			180	730	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	370	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	370	680	J	ng/L	07/22/2021	07/29/2021	10:48:00	08/05/2021	21:02:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/24/2021	PACE ANALYTICAL	100	N			180	730	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	680	NG/L	J	Y	P	Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	370	180	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/24/2021	PACE ANALYTICAL	100	N			180	730	4-2 FLUOROTELOMER SULFONATE	370	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	370	180	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/24/2021	PACE ANALYTICAL	100	N			180	730	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	370	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	370	180	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/24/2021	PACE ANALYTICAL	100	N			180	730	9CL-PF3ONS	370	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Hexafluoropropylene oxide dimer acid (GenX)	370	180	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/24/2021	PACE ANALYTICAL	100	N			180	730	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	370	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	370	180	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/24/2021	PACE ANALYTICAL	100	N			180	730	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	370	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	370	180	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/24/2021	PACE ANALYTICAL	100	N			180	730	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	370	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	180	620		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROBUTANESULFONIC ACID (PFBS)	620	NG/L		Y		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	180	91	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUORODECANESULFONIC ACID (PFDS)	180	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	180	500		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	500	NG/L		Y		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	180	91	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUORONONANESULFONIC ACID (PFNS)	180	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	180	91	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROOCTANE SULFONAMIDE (FOSA)	180	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	180	590		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROPENTANESULFONIC ACID (PFPES)	590	NG/L		Y		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-butanoic acid (PFBA)	180	350	J	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROBUTANOIC ACID (PFBA)	350	NG/L	J	Y	P	Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-decanoic acid (PFDA)	180	91	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUORODECANOIC ACID (PFDA)	180	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	180	91	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUORODODECANOIC ACID (PFDOA)	180	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-heptanoic acid (PFHpA)	180	230	J	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROHEPTANOIC ACID (PFHPA)	230	NG/L	J	Y	P	Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-hexanoic acid (PFHxA)	180	1700		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROHEXANOIC ACID (PFHXA)	1700	NG/L		Y		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-nonanoic acid (PFNA)	180	91	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUORONONANOIC ACID (PFNA)	180	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-octanoic acid (PFOA)	180	610		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/24/2021	PACE ANALYTICAL	100	N			91	360	PENTADECAFLUOROOCTANOIC ACID (PFOA)	610	NG/L		Y		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-pentanoic acid (PFPeA)	180	510		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROPENTANOIC ACID (PFPEA)	510	NG/L		Y		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	180	91	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROTETRADECANOIC ACID (PFTEA)	180	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	180	91	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROTRIDECANOIC ACID (PFTRIA)	180	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluoro-n-undecanoic acid (PFUdA)	180	91	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROUNDECANOIC ACID (PFUNA)	180	NG/L	U	N		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluorohexanesulfonic acid (PFHxS)	180	5200		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROHEXANESULFONIC ACID (PFHXS)	5200	NG/L		Y		Y
WG24009-006	WG24009	NM	AOPC6-14D02A-072221	AQ	Perfluorooctanesulfonic acid (PFOS)	180	15000		ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	20:16:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/24/2021	PACE ANALYTICAL	100	N			91	360	PERFLUOROOCTANESULFONIC ACID (PFOS)	15000	NG/L		Y		Y
WG24009-007	WG24009	NM	AOPC1,6,7-14C60A-072221	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	36	18	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/24/2021	PACE ANALYTICAL	10	N			18	72	11CL-PF3OUDS	36	NG/L	U	N		Y
WG24009-007	WG24009	NM	AOPC1,6,7-14C60A-072221	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	36	18	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/24/2021	PACE ANALYTICAL	10	N			18	72	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	36	NG/L	U	N		Y
WG24009-007	WG24009	NM	AOPC1,6,7-14C60A-072221	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	18	35	J	ng/L	07/22/2021	07/29/2021	10:48:00	08/05/2021	19:58:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/24/2021	PACE ANALYTICAL	5	N			9.1	36	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	35	NG/L	J	Y	P	Y
WG24009-007	WG24009	NM	AOPC1,6,7-14C60A-072221	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	36	18	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/24/2021	PACE ANALYTICAL	10	N			18	72	4-2 FLUOROTELOMER SULFONATE	36	NG/L	U	N		Y
WG24009-007	WG24009	NM	AOPC1,6,7-14C60A-072221	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	36	18	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/24/2021	PACE ANALYTICAL	10	N			18	72	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	36	NG/L	U	N		Y
WG24009-007	WG24009	NM	AOPC1,6,7-14C60A-072221	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	36	18	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/24/2021	PACE ANALYTICAL	10	N			18	72	9CL-PF3ONS	36	NG/L	U	N		Y
WG24009-007	WG24009	NM	AOPC1,6,7-14C60A-072221	AQ	Hexafluoropropylene oxide dimer acid (GenX)	36	18	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/24/2021	PACE ANALYTICAL	10	N			18	72	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	36	NG/L	U	N		Y
WG24009-007	WG24009	NM	AOPC1,6,7-14C60A-072221	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	36	18	U	ng/L	07/22/2021	07/29/2021	10:48:00	08/04/2021	19:33:00	PFAS	PFAS by ID SO

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2	5		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROPENTANESULFONIC ACID (PFPES)	5	NG/L		Y		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-butanoic acid (PFBA)	2	12		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROBUTANOIC ACID (PFBA)	12	NG/L		Y		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-decanoic acid (PFDA)	2	0.98	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUORODECANOIC ACID (PFDA)	2	NG/L	U	N		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2	0.98	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUORODODECANOIC ACID (PFDOA)	2	NG/L	U	N		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2	0.98	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROHEPTANOIC ACID (PFHPA)	2	NG/L	U	N		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2	0.98	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROHEXANOIC ACID (PFHXA)	2	NG/L	U	N		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-nonanoic acid (PFNA)	2	0.98	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLURONONANOIC ACID (PFNA)	2	NG/L	U	N		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-octanoic acid (PFOA)	2	24		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PENTADECAFLUOROOCTANOIC ACID (PFOA)	24	NG/L		Y		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-pentanoic acid (PFPeA)	2	0.98	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROPENTANOIC ACID (PFPEA)	2	NG/L	U	N		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2	0.98	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROTETRADECANOIC ACID (PFTEA)	2	NG/L	U	N		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	2	0.98	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2	NG/L	U	N		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluoro-n-undecanoic acid (PFUdA)	2	0.98	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROUNDECANOIC ACID (PFUNA)	2	NG/L	U	N		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluorohexanesulfonic acid (PFHxS)	2	47		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROHEXANESULFONIC ACID (PFHXS)	47	NG/L		Y		Y
WG24009-009	WG24009	NM	AOPC17,21-EXW-4-072321	AQ	Perfluorooctanesulfonic acid (PFOS)	2	27		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	17:57:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/24/2021	PACE ANALYTICAL	1	N			0.98	3.9	PERFLUOROOCTANESULFONIC ACID (PFOS)	27	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.2	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.2	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	110		ng/L	07/23/2021	07/29/2021	10:48:00	08/05/2021	19:37:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.2	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	110	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.2	4:2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.2	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.2	9CL-PF3ONS	3.6	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.2	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.6	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.2	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.6	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.2	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.6	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	22		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROBUTANESULFONIC ACID (PFBS)	22	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.9	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	5.2		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	5.2	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.9	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLURONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.9	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	23		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROPENTANESULFONIC ACID (PFPES)	23	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	82		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROBUTANOIC ACID (PFBA)	82	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.9	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.9	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	52		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEPTANOIC ACID (PFHPA)	52	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	180		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEXANOIC ACID (PFHXA)	180	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.91	J	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLURONONANOIC ACID (PFNA)	0.91	NG/L	J	Y	P	Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	25		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PENTADECAFLUOROOCTANOIC ACID (PFOA)	25	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	190		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROPENTANOIC ACID (PFPEA)	190	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.9	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.9	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.9	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	220		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROHEXANESULFONIC ACID (PFHXS)	220	NG/L		Y		Y
WG24009-010	WG24009	NM	ADCP18-A-072321	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	150		ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:08:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/24/2021	PACE ANALYTICAL	1	N			0.9	3.6	PERFLUOROOCTANESULFONIC ACID (PFOS)	150	NG/L		Y		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.1	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.1	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.1	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.6	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.1	4:2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.1	9CL-PF3ONS	3.6	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.1	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.6	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.1	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.6	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.6	1.8	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/24/2021	PACE ANALYTICAL	1	N			1.8	7.1	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.6	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLURONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLUOROBUTANOIC ACID (PFBA)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLUOROHEXANOIC ACID (PFHXA)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/24/2021	PACE ANALYTICAL	1	N			0.89	3.6	PERFLURONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG24009-011	WG24009	NM	FB-13-072321	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	0.89	U	ng/L	07/23/2021	07/29/2021	10:48:00	08/04/2021	18:51:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/24/2021

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG31010-003	WG31010	NM	ERB-02-072921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.9	2.5	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.7	11CL-PF3OUDS	2.5	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.9	3.7	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.7	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	3.7	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.9	770		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.7	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	770	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.9	4.8	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.7	4-2 FLUOROTELOMER SULFONATE	4.8	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.9	3.7	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.7	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.9	3.4	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.7	9CL-PF3ONS	3.4	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.9	8.3		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	8.3	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.9	3.1	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.1	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.9	3.8	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.8	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.9	5.5		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROBUTANESULFONIC ACID (PFBS)	5.5	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.9	2.1	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUORODECANESULFONIC ACID (PFDS)	2.1	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	6.6		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	6.6	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	3.3	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUORONONANESULFONIC ACID (PFNS)	3.3	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	4.1		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROOCTANE SULFONAMIDE (FOSA)	4.1	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	6.2		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROPENTANESULFONIC ACID (PFPES)	6.2	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	43		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROBUTANOIC ACID (PFBA)	43	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	4		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUORODECANOIC ACID (PFDA)	4	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	3.3	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUORODODECANOIC ACID (PFDOA)	3.3	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	24		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROHEPTANOIC ACID (PFHPA)	24	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	89		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROHEXANOIC ACID (PFHXA)	89	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	4.4		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUORONONANOIC ACID (PFNA)	4.4	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	75		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PENTADECAFLUOROOCTANOIC ACID (PFOA)	75	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	190		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROPENTANOIC ACID (PFPEA)	190	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	1.6	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.6	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	2.1	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2.1	NG/L	J	Y	P	Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	4		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROUNDECANOIC ACID (PFUNA)	4	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	35		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROHEXANESULFONIC ACID (PFHXS)	35	NG/L		Y		Y
WG31010-003	WG31010	NM	ERB-02-072921	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	280		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:35:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.96	3.8	PERFLUOROOCTANESULFONIC ACID (PFOS)	280	NG/L		Y		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.1	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.1	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.1	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	3.6	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.1	4-2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.1	9CL-PF3ONS	3.6	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.6	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.1	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.6	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.6	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.1	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.6	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.6	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.1	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.6	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROBUTANOIC ACID (PFBA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROHEXANOIC ACID (PFHXA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUORONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROPENTANOIC ACID (PFPEA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.8	NG/L	U	N		Y
WG31010-004	WG31010	NM	ERB-03-072921	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	0.89	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	22:46:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.89	3.6	PERFLUOROOCTANESULFONIC ACID (PFOS)	1.8	NG/L	U	N		Y
WG31010-005	WG31010	NM	AOPC2-PFAS-E-072921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.8	1.9	U	ng/L	07/29/2021	08/18/2021	11:59:00	08/21/2021	04:39:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.6	11CL-PF3OUDS	3.8	NG/L	U	N		Y
WG31010-005	WG31010	NM	AOPC2-PFAS-E-072921	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.8	1.9	U	ng/L	07/29/2021	08/18/2021	11:59:00	08/21/2021	04:39:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.6	8-2 FLUOROTELOMER SULFONATE (8:2FTS)	3.8	NG/L	U	N		Y
WG31010-005	WG31010	NM	AOPC2-PFAS-E-072921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.8	1.9	U	ng/L	07/29/2021	08/18/2021	11:59:00	08/21/2021	04:39:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.6	6-2 FLUOROTELOMER SULFONATE (6:2FTS)	3.8	NG/L	U	N		Y
WG31010-005	WG31010	NM	AOPC2-PFAS-E-072921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.8	1.9	U	ng/L	07/29/2021	08/18/2021	11:59:00	08/21/2021	04:39:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.6	4-2 FLUOROTELOMER SULFONATE	3.8	NG/L	U	N		Y
WG31010-005	WG31010	NM	AOPC2-PFAS-E-072921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.8	1.9	U	ng/L	07/29/2021	08/18/2021	11:59:00	08/21/2021	04:39:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.6	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.8	NG/L	U	N		Y
WG31010-005	WG31010	NM	AOPC2-PFAS-E-072921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.8	1.9	U	ng/L	07/29/2021	08/18/2021	11:59:00	08/21/2021	04:39:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.6	9CL-PF3ONS	3.8	NG/L	U	N		Y
WG31010-005	WG31010	NM	AOPC2-PFAS-E-072921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.8	1.9	U	ng/L	07/29/2021	08/18/2021	11:59:00	08/21/2021	04:39:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/31/2021	SHEALY ENV SERVICES	1		N		1.9	7.6	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERFLAG
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	2.9	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	2.9	NG/L	J	Y	P	Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	3.2	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROBUTANOIC ACID (PFBA)	3.2	NG/L	J	Y	P	Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	1.8	NG/L	U	N		Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	1.9	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUORONONANOIC ACID (PFNA)	1.9	NG/L	J	Y	P	Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	1.7	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.7	NG/L	J	Y	P	Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROPENTANOIC ACID (PFPEA)	1.8	NG/L	U	N		Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	23		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROHEXANESULFONIC ACID (PFHXS)	23	NG/L		Y		Y
WG31010-007	WG31010	FD	AOPC2-PFAS-F-072921-FD	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	15		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:07:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROOCTANESULFONIC ACID (PFOS)	15	NG/L	J	Y	G	Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.5	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7	11CL-PF3OUDS	3.5	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.5	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.5	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.5	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.5	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.5	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7	4:2 FLUOROTELOMER SULFONATE	3.5	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.5	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.5	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.5	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7	9CL-PF3ONS	3.5	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.5	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.5	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.5	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.5	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.5	1.8	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.5	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROBUTANOIC ACID (PFBA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUORONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROPENTANOIC ACID (PFPEA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.88	U	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	58		ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROHEXANESULFONIC ACID (PFHXS)	58	NG/L		Y		Y
WG31010-008	WG31010	NM	FB-16-072921	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	1.1	J	ng/L	07/29/2021	08/12/2021	18:07:00	08/14/2021	23:18:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.88	3.5	PERFLUOROOCTANESULFONIC ACID (PFOS)	1.1	NG/L	J	Y	P	Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.7	1.8	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.3	11CL-PF3OUDS	3.7	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.7	1.8	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.3	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.7	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.7	33		ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.3	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	33	NG/L		Y		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.7	1.8	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.3	4:2 FLUOROTELOMER SULFONATE	3.7	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.7	1.8	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.3	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.7	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.7	1.8	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.3	9CL-PF3ONS	3.7	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.7	1.8	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.3	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.7	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.7	1.8	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.3	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.7	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.7	1.8	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/31/2021	SHEALY ENV SERVICES	1		N		1.8	7.3	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.7	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.9	9.5		ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUOROBUTANESULFONIC ACID (PFBS)	9.5	NG/L		Y		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.9	0.92	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUORODECANESULFONIC ACID (PFDS)	1.9	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	0.92	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.9	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	0.92	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUORONONANESULFONIC ACID (PFNS)	1.9	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.9	0.92	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.9	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	1.6	J	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.6	NG/L	J	Y	P	Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	13		ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUOROBUTANOIC ACID (PFBA)	13	NG/L		Y		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.92	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.92	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	0.92	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUOROHEPTANOIC ACID (PFHPA)	1.9	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	0.92	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/31/2021	SHEALY ENV SERVICES	1		N		0.92	3.7	PERFLUOROHEXANOIC ACID (PFHXA)	1.9	NG/L	U	N		Y
WG31011-001	WG31011	NM	AOPC2,26-D-072721	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.92	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/14/2021	23:29:00	PFAS	PFAS by ID SOP QSM B	SOP SPE

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	4.1	2	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/31/2021	SHEALY ENV SERVICES	1	N		2	8.1	11CL-PF3OUDS	4.1	NG/L	U	N		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	4.1	7.9	J	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/31/2021	SHEALY ENV SERVICES	1	N		2	8.1	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	7.9	NG/L	J	Y	P	Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	4.1	160		ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/31/2021	SHEALY ENV SERVICES	1	N		2	8.1	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	160	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	4.1	2	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/31/2021	SHEALY ENV SERVICES	1	N		2	8.1	4:2 FLUOROTELOMER SULFONATE	4.1	NG/L	U	N		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	4.1	2	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/31/2021	SHEALY ENV SERVICES	1	N		2	8.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	4.1	NG/L	U	N		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	4.1	2	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/31/2021	SHEALY ENV SERVICES	1	N		2	8.1	9CL-PF3ONS	4.1	NG/L	U	N		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Hexafluoropropylene oxide dimer acid (GenX)	4.1	2	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/31/2021	SHEALY ENV SERVICES	1	N		2	8.1	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	4.1	NG/L	U	N		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	4.1	2	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/31/2021	SHEALY ENV SERVICES	1	N		2	8.1	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	4.1	NG/L	U	N		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	4.1	2	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/31/2021	SHEALY ENV SERVICES	1	N		2	8.1	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	4.1	NG/L	U	N		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	2	110		ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUOROBUTANESULFONIC ACID (PFBS)	110	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	2	1	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUORODECANESULFONIC ACID (PFDS)	2	NG/L	U	N		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	2	95		ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	95	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	2	3.9	J	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUORONONANESULFONIC ACID (PFNS)	3.9	NG/L	J	Y	P	Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	2	3.5	J	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUOROOCTANE SULFONAMIDE (FOSA)	3.5	NG/L	J	Y	P	Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	2	190		ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUOROPENTANESULFONIC ACID (PFPES)	190	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-butanoic acid (PFBA)	2	200		ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUOROBUTANOIC ACID (PFBA)	200	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-decanoic acid (PFDA)	2	5.3		ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUORODECANOIC ACID (PFDA)	5.3	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	2	1	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUORODODECANOIC ACID (PFDOA)	2	NG/L	U	N		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-heptanoic acid (PFHpA)	2	400		ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUOROHEPTANOIC ACID (PFHPA)	400	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-hexanoic acid (PFHxA)	2	620		ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUOROHEXANOIC ACID (PFHXA)	620	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-nonanoic acid (PFNA)	2	36		ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUORONONANOIC ACID (PFNA)	36	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-octanoic acid (PFOA)	2	240		ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PENTADECAFLUOROOCTANOIC ACID (PFOA)	240	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-pentanoic acid (PFPeA)	41	1400		ng/L	07/27/2021	08/12/2021	18:07:00	08/16/2021	15:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/31/2021	SHEALY ENV SERVICES	20	N		20	81	PERFLUOROPENTANOIC ACID (PFPEA)	1400	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	2	1	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUOROTETRADECANOIC ACID (PFTEA)	2	NG/L	U	N	N	Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	2	1	U	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUOROTRIDECANOIC ACID (PFTRIA)	2	NG/L	U	N		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluoro-n-undecanoic acid (PFUdA)	2	1.2	J	ng/L	07/27/2021	08/12/2021	18:07:00	08/15/2021	00:01:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/31/2021	SHEALY ENV SERVICES	1	N		1	4	PERFLUOROUNDECANOIC ACID (PFUNA)	1.2	NG/L	J	Y	P	Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluorohexanesulfonic acid (PFHxS)	41	2200		ng/L	07/27/2021	08/12/2021	18:07:00	08/16/2021	15:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/31/2021	SHEALY ENV SERVICES	20	N		20	81	PERFLUOROHEXANESULFONIC ACID (PFHXS)	2200	NG/L		Y		Y
WG31011-004	WG31011	NM	AOPC1,7-W20-01-072721	AQ	Perfluorooctanesulfonic acid (PFOS)	41	5000		ng/L	07/27/2021	08/12/2021	18:07:00	08/16/2021	15:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/31/2021	SHEALY ENV SERVICES	20	N		20	81	PERFLUOROOCTANESULFONIC ACID (PFOS)	5000	NG/L		Y		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.4	1.7	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/31/2021	SHEALY ENV SERVICES	1	N		1.7	6.8	11CL-PF3OUDS	3.4	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.4	1.7	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/31/2021	SHEALY ENV SERVICES	1	N		1.7	6.8	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.4	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.4	1.7	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/31/2021	SHEALY ENV SERVICES	1	N		1.7	6.8	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.4	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.4	1.7	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/31/2021	SHEALY ENV SERVICES	1	N		1.7	6.8	4:2 FLUOROTELOMER SULFONATE	3.4	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.4	1.7	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/31/2021	SHEALY ENV SERVICES	1	N		1.7	6.8	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.4	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.4	1.7	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/31/2021	SHEALY ENV SERVICES	1	N		1.7	6.8	9CL-PF3ONS	3.4	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.4	1.7	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/31/2021	SHEALY ENV SERVICES	1	N		1.7	6.8	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	3.4	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.4	1.7	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/31/2021	SHEALY ENV SERVICES	1	N		1.7	6.8	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.4	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.4	1.7	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/31/2021	SHEALY ENV SERVICES	1	N		1.7	6.8	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.4	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUORODECANESULFONIC ACID (PFDS)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUORONONANESULFONIC ACID (PFNS)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-butanoic acid (PFBA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROBUTANOIC ACID (PFBA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-decanoic acid (PFDA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUORODECANOIC ACID (PFDA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUORODODECANOIC ACID (PFDOA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROHEPTANOIC ACID (PFHPA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROHEXANOIC ACID (PFHXA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUORONONANOIC ACID (PFNA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-octanoic acid (PFOA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROPENTANOIC ACID (PFPEA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROUNDECANOIC ACID (PFUNA)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.7	NG/L	U	N		Y
WG31011-005	WG31011	NM	FB-14-072721	AQ	Perfluorooctanesulfonic acid (PFOS)	1.7	0.85	U	ng/L	07/27/2021	08/18/2021	11:59:00	08/21/2021	05:11:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/31/2021	SHEALY ENV SERVICES	1	N		0.85	3.4	PERFLUOROOCTANESULFONIC ACID (PFOS)	1.7	NG/L	U	N		Y
WG31011-006	WG31011	NM	AOPC2-PFAS-G-072821	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/28/2021	08/18/2021	11:59:00	08/21/2021	05:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/31/2021	SHEALY ENV SERVICES	1	N		1.8	7.2	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG31011-006	WG31011	NM	AOPC2-PFAS-G-072821	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	1.8	U	ng/L	07/28/2021	08/18/2021	11:59:00	08/21/2021	05:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/31/2021	SHEALY ENV SERVICES	1	N		1.8	7.2	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG31011-006	WG31011	NM	AOPC2-PFAS-G-072821	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	77		ng/L	07/28/2021	08/18/2021	11:59:00	08/21/2021	05:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/31/2021	SHEALY ENV SERVICES	1	N		1.8	7.2	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	77	NG/L		Y		Y
WG31011-006	WG31011	NM	AOPC2-PFAS-G-072821	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/28/2021	08/18/2021	11:59:00	08/21/2021	05:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/31/2021	SHEALY ENV SERVICES	1	N		1.8	7.2	4:2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG31011-006	WG31011	NM	AOPC2-PFAS-G-072821	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/28/2021	08/18/2021	11:59:00	08/21/2021	05:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/31/2021	SHEALY ENV SERVICES	1	N		1.8	7.2	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG31011-006	WG31011	NM	AOPC2-PFAS-G-072821	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/28/2021	08/18/2021	11:59:00	08/21/2021	05:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/31/2021	SHEALY ENV SERVICES	1	N		1.8	7.2	9CL-PF3ONS	3.6	NG/L	U	N		Y
WG31011-006	WG31011	NM	AOPC2-PFAS-G-072821	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.6	1.8	U	ng/L	07/28/2021	08/18/2021	11:59:00	08/21/2021	05:22:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/31/2021	SHEALY ENV SERVICES	1	N		1.8	7.2	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HPFO-DA)	3.6	NG/L	U	N		Y
WG31011-006	WG31011	NM	AOPC2-PFAS-G-072821	AQ	N-ethylperfluoro-1-octanesul

LABSID	SDGNUM	SMPTYPE	CLIENTSID	MATRIX	ANALYTE	LOD	RESULT	QUAL	UNITS	SAMPDATE	EXTDATE	EXTTIME	ANYLDATE	ANLYTIME	ANLYGRP	ANLYMETHOD	EXTMETHOD	TIC	RETENTIME	CASNO	RCVDDATE	LABCODE	DILFACT	SMPWTVOL	SURROGATE	QCBATCH	DL	LOQ	VALPARA	VALRESULT	VALUNITS	VALQUAL	VALDETECT	VALQUALCODE	VALUSERLAG
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	27		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUOROPENTANESULFONIC ACID (PFPES)	27	NG/L		Y		Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-butanoic acid (PFBA)	1.9	49		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUOROBUTANOIC ACID (PFBA)	49	NG/L		Y		Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-decanoic acid (PFDA)	1.9	0.92	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUORODECANOIC ACID (PFDA)	1.9	NG/L	U	N		Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.9	0.92	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUORODODECANOIC ACID (PFDOA)	1.9	NG/L	U	N		Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.9	0.93	J	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUOROHEPTANOIC ACID (PFHPA)	0.93	NG/L	J	Y	P	Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.9	2.1	J	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUOROHEXANOIC ACID (PFHXA)	2.1	NG/L	J	Y	P	Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.9	0.92	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUORONONANOIC ACID (PFNA)	1.9	NG/L	U	N		Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-octanoic acid (PFOA)	1.9	8.3		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PENTADECAFLUOROOCTANOIC ACID (PFOA)	8.3	NG/L		Y		Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.9	2.3	J	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUOROPENTANOIC ACID (PFPEA)	2.3	NG/L	J	Y	P	Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.9	0.92	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.9	NG/L	U	N		Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.9	0.92	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.9	NG/L	U	N		Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.9	0.92	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUOROUNDECANOIC ACID (PFUNA)	1.9	NG/L	U	N		Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.9	120	S	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUOROHEXANESULFONIC ACID (PFHXS)	120	NG/L		Y		Y
WG31011-008	WG31011	NM	AOPC10-WGC2-11-072821	AQ	Perfluorooctanesulfonic acid (PFOS)	1.9	32		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:33:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.92	3.7	PERFLUOROOCTANESULFONIC ACID (PFOS)	32	NG/L		Y		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.6	1.8	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/31/2021	SHEALY ENV SERVICES	1	N			1.8	7.1	11CL-PF3OUDS	3.6	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.6	1.8	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/31/2021	SHEALY ENV SERVICES	1	N			1.8	7.1	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.6	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.6	9.6		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/31/2021	SHEALY ENV SERVICES	1	N			1.8	7.1	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	9.6	NG/L		Y		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.6	1.8	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/31/2021	SHEALY ENV SERVICES	1	N			1.8	7.1	4:2 FLUOROTELOMER SULFONATE	3.6	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.6	1.8	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/31/2021	SHEALY ENV SERVICES	1	N			1.8	7.1	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.6	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.6	1.8	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/31/2021	SHEALY ENV SERVICES	1	N			1.8	7.1	9CL-PF3ONS	3.6	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.6	1.8	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/31/2021	SHEALY ENV SERVICES	1	N			1.8	7.1	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.6	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.6	1.8	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/31/2021	SHEALY ENV SERVICES	1	N			1.8	7.1	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.6	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.6	1.8	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/31/2021	SHEALY ENV SERVICES	1	N			1.8	7.1	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.6	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	19		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROBUTANESULFONIC ACID (PFBS)	19	NG/L		Y		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.89	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	2.2	J	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2.2	NG/L	J	Y	P	Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.89	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.89	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	12		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	12	NG/L		Y		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	22		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROBUTANOIC ACID (PFBA)	22	NG/L		Y		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.89	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.89	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.99	J	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	0.99	NG/L	J	Y	P	Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	2.7	J	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	2.7	NG/L	J	Y	P	Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.89	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-95-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUORONONANOIC ACID (PFNA)	1.8	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-octanoic acid (PFOA)	1.8	48		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-67-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PENTADECAFLUOROOCTANOIC ACID (PFOA)	48	NG/L		Y		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-pentanoic acid (PFPeA)	1.8	1.5	J	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-90-3	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROPENTANOIC ACID (PFPEA)	1.5	NG/L	J	Y	P	Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-tetradecanoic acid (PFTeDA)	1.8	0.89	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		376-06-7	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROTETRADECANOIC ACID (PFTEA)	1.8	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-tridecanoic acid (PFTrDA)	1.8	0.89	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		72629-94-8	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROTRIDECANOIC ACID (PFTRIA)	1.8	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluoro-n-undecanoic acid (PFUdA)	1.8	0.89	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2058-94-8	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROUNDECANOIC ACID (PFUNA)	1.8	NG/L	U	N		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluorohexanesulfonic acid (PFHxS)	1.8	110		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		355-46-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROHEXANESULFONIC ACID (PFHXS)	110	NG/L		Y		Y
WG31011-009	WG31011	NM	AOPC9-W2-12-072821	AQ	Perfluorooctanesulfonic acid (PFOS)	1.8	89		ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	21:54:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		1763-23-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.89	3.5	PERFLUOROOCTANESULFONIC ACID (PFOS)	89	NG/L		Y		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	11-chloroeicosafluoro-3-oxaundecane-1-sulfoni	3.5	1.7	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		763051-92-9	07/31/2021	SHEALY ENV SERVICES	1	N			1.7	7	11CL-PF3OUDS	3.5	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid	3.5	1.7	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		39108-34-4	07/31/2021	SHEALY ENV SERVICES	1	N			1.7	7	8:2 FLUOROTELOMER SULFONATE (8:2FTS)	3.5	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid	3.5	1.7	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		27619-97-2	07/31/2021	SHEALY ENV SERVICES	1	N			1.7	7	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	3.5	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	1H,1H,2H,2H-perfluorohexane sulfonic acid (4:	3.5	1.7	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		757124-72-4	07/31/2021	SHEALY ENV SERVICES	1	N			1.7	7	4:2 FLUOROTELOMER SULFONATE	3.5	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	3.5	1.7	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		919005-14-4	07/31/2021	SHEALY ENV SERVICES	1	N			1.7	7	4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	3.5	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	9-chlorohexadecafluoro-3-oxanone-1-sulfonic a	3.5	1.7	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		756426-58-1	07/31/2021	SHEALY ENV SERVICES	1	N			1.7	7	9CL-PF3ONS	3.5	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Hexafluoropropylene oxide dimer acid (GenX)	3.5	1.7	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		13252-13-6	07/31/2021	SHEALY ENV SERVICES	1	N			1.7	7	HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	3.5	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	N-ethylperfluoro-1-octanesulfonamidoacetic ac	3.5	1.7	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2991-50-6	07/31/2021	SHEALY ENV SERVICES	1	N			1.7	7	N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)	3.5	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	N-methylperfluoro-1-octanesulfonamidoacetic a	3.5	1.7	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2355-31-9	07/31/2021	SHEALY ENV SERVICES	1	N			1.7	7	N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)	3.5	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-1-butanesulfonic acid (PFBS)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-73-5	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUOROBUTANESULFONIC ACID (PFBS)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-1-decanesulfonic acid (PFDS)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-77-3	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUORODECANESULFONIC ACID (PFDS)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-1-heptanesulfonic acid (PFHpS)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-92-8	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-1-nonanesulfonic acid (PFNS)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		68259-12-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUORONONANESULFONIC ACID (PFNS)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-1-octanesulfonamide (PFOSA)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		754-91-6	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUOROOCTANE SULFONAMIDE (FOSA)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-1-pentanesulfonic acid (PFPeS)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		2706-91-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUOROPENTANESULFONIC ACID (PFPES)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-n-butanoic acid (PFBA)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-22-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUOROBUTANOIC ACID (PFBA)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-n-decanoic acid (PFDA)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		335-76-2	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUORODECANOIC ACID (PFDA)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-n-dodecanoic acid (PFDoA)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-55-1	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUORODODECANOIC ACID (PFDOA)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-n-heptanoic acid (PFHpA)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		375-85-9	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUOROHEPTANOIC ACID (PFHPA)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-n-hexanoic acid (PFHxA)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP QSM B	SOP SPE	N		307-24-4	07/31/2021	SHEALY ENV SERVICES	1	N			0.87	3.5	PERFLUOROHEXANOIC ACID (PFHXA)	1.8	NG/L	U	N		Y
WG31011-010	WG31011	NM	FB-15-072821	AQ	Perfluoro-n-nonanoic acid (PFNA)	1.8	0.87	U	ng/L	07/28/2021	08/13/2021	19:02:00	08/15/2021	22:15:00	PFAS	PFAS by ID SOP Q

TETRA TECH

INTERNAL CORRESPONDENCE

TO: D. WILSON **DATE:** SEPTEMBER 10, 2021

FROM: GLORIA SCHIFINO **COPIES:** DV FILE

SUBJECT: **ORGANIC DATA VALIDATION – PER & POLYFLUOROALKYL SUBSTANCES (PFAS)**
NASA AMES
SAMPLE DELIVERY GROUP (SDG) WG10017

SAMPLES: 21/ Aqueous samples

AOPC10-WGC2-12-070721	AOPC10-WGC2-12-070721-FD
AOPC10-WGC2-4-070721	AOPC10-WGC2-5-070721
AOPC10-WGC2-6-070721	AOPC16-WU5-9-070821
AOPC17-W3-1-070721	AOPC17-W3-20-070721
AOPC17-W3-8-070821	AOPC26-W5-3-070821
AOPC8-W1-14-070921	AOPC8-W1-19-070921
AOPC8-W1-19-070921-FD	AOPC8-W1-1R-070921
AOPC8-W1-20-070921	AOPC8-W1-5-070921
AOPC9,16-W2-16-070821	ERB-01-070721
FB-01-070721	FB-02-070821
FB-03-070921	

Overview

The sample set for NASA Ames, SDG WG10017 consisted of twenty-one (21) aqueous samples. All samples were analyzed for PFAS. Two (2) field duplicate sample pairs (AOPC10-WGC2-12-070721/ AOPC10-WGC2-12-070721-FD) and (AOPC8-W1-19-070921/ AOPC8-W1-19-070921-FD) were included in this SDG.

The samples were collected by Tetra Tech, Inc. on July 7-9, 2021 and analyzed by Pace Analytical. The analyses were conducted in compliance with Department of Defense (DoD)/Department of Energy (DOE) for Environmental Laboratories version 5.3 PFAS using LC/MS/MS (May 2019). The data contained in this SDG was validated via Stage 2B:

* • Data completeness
* • Hold times/Sample Preservation
* • Mass Calibration
* • LC/MS/MS System Tuning and Performance
* • Mass Spectral Acquisition Rate
* • Instrument Sensitivity Check
* • Ion Transition Check
* • Initial/Continuing Calibrations
  • Laboratory Method/Preparation and Field Blank Results
* • Field Reagent Blank Results
  • Extraction Internal Standard Recoveries
* • Injection Internal Standard Recoveries
* • Laboratory Control Sample Recoveries
* • Field Duplicate Precision
* • Compound Identification

* • Compound Quantitation
• Matrix spike/matrix spike duplicate recoveries

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, and documentation supporting these findings is presented in Appendix C.

PFAS

The following labeled extraction internal standard recoveries were < 50% but ≥ 20% quality control limit:

Sample	Labeled Standard	Compounds Affected	Data Qualification
AOPC10-WGC2-4-070721	13C4-PFBA	PFBA	J+
AOPC8-W1-20-070921	13C2-PFTeDA	PFTrDA	UJ

The following compound was detected in the method blank (batch 99118) on 7/16/2021 for associated samples at the following maximum concentration.

Compound	Concentration	Action Level Limit of Quantitation LOQ) > or <
PFOA	1.3 ng/L	< LOQ

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

The matrix spike / matrix spike duplicate relative percent differences (RPD) PFOA was above the quality control limits for sample AOPC8-W1-20-070921. The detected results were qualified as (J).

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

Additional Comments

The following labeled extraction internal standard recovery 4:2 FTS was >100% quality control limit for samples AOPC10-WGC2-4-070721 and AOPC9,16-W2-16-070821.

Detected results reported below the LOQ but above the Detection Limit (DL) were qualified as estimated, (J).

Non-detected results were reported to the LOD.

Executive Summary

Laboratory Performance Issues: Two extracted internal standards were outside of quality control limits. PFOA was detected in a method blank.

Other Factors Affecting Data Quality: Detected results below the LOQ were estimated. The matrix spike / matrix spike duplicate relative percent differences (RPD) PFOA was above the quality control limits.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled “Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis be QSM Table B15” (May 2020). The text of this report has been formulated to address only those areas affecting data quality.

Gloria Schifino

Tetra Tech, Inc.
Gloria Schifino
Chemist/Data Validator

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

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

Data Qualifier Definitions

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

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

Appendix A

Qualified Analytical Results

Qualifier Codes:

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

PROJ_NO: 09033A	NSAMPLE	AOPC10-WGC2-12-070721			AOPC10-WGC2-12-070721-FD			AOPC10-WGC2-4-070721			AOPC10-WGC2-5-070721		
SDG: WG10017	LAB_ID	WG10017-002			WG10017-003			WG10017-004			WG10017-005		
FRACTION: PFAS	SAMP_DATE	7/7/2021			7/7/2021			7/7/2021			7/7/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF				AOPC10-WGC2-12-070721								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.6	U		3.6	U		3.7	U		3.5	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.6	U		3.6	U		3.7	U		3.5	U	
4:2 FLUOROTELOMER SULFONATE		3.6	U		3.6	U		3.7	U		3.5	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		6.9	J	P	9.9			19			5.6	J	P
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.6	U		3.6	U		3.7	U		3.5	U	
9CL-PF3ONS		3.6	U		3.6	U		3.7	U		3.5	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.6	U		3.6	U		3.7	U		3.5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.6	U		3.6	U		3.7	U		3.5	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.6	U		3.6	U		3.7	U		3.5	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		3.7			3.2	J	P	17			11		
PERFLUOROBUTANESULFONIC ACID (PFBS)		1.1	J	P	1.2	J	P	31			1.9	J	P
PERFLUOROBUTANOIC ACID (PFBA)		4.1			4.1			34	J+	N	6.1		
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U		1.8	U		1.8	U		1.8	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U		1.8	U		1.3	J	P	1.8	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U		1.8	U		1.8	U		1.8	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.8	U		1.8	U		1.8	U		1.8	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		1.8	U		1.8	U		12			1.1	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		5.4			5			25			4.5		
PERFLUOROHEXANOIC ACID (PFHXA)		1.8	U		1.8	U		27			1.8	U	
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U		1.8	U		1.8	U		1.8	U	
PERFLUORONONANOIC ACID (PFNA)		1.8	U		1.8	U		2.1	J	P	1.8	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.8	U		1.8	U		1.8	U		1.8	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		1.8	U		1.8	U		34			2.4	J	P
PERFLUOROPENTANESULFONIC ACID (PFPES)		1.8	U		1.8	U		4.4			1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC10-WGC2-6-070721			AOPC16-WU5-9-070821			AOPC17-W3-1-070721			AOPC17-W3-20-070721		
SDG: WG10017	LAB_ID	WG10017-001			WG10017-011			WG10017-009			WG10017-008		
FRACTION: PFAS	SAMP_DATE	7/7/2021			7/8/2021			7/7/2021			7/7/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.9	U		6.5	U		3.6	U		4.2	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.9	U		6.5	U		3.6	U		4.2	U	
4:2 FLUOROTELOMER SULFONATE		3.9	U		6.5	U		3.6	U		4.2	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		21			8.4	J	P	8.3			14		
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.9	U		6.5	U		3.6	U		4.2	U	
9CL-PF3ONS		3.9	U		6.5	U		3.6	U		4.2	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.9	U		6.5	U		3.6	U		4.2	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.9	U		6.5	U		3.6	U		4.2	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.9	U		6.5	U		3.6	U		4.2	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1	J	P	44			44			160		
PERFLUOROBUTANESULFONIC ACID (PFBS)		1.6	J	P	6.6			8			12		
PERFLUOROBUTANOIC ACID (PFBA)		6.8			16			15			19		
PERFLUORODECANESULFONIC ACID (PFDS)		1.9	U		3.3	U		1.8	U		2.1	U	
PERFLUORODECANOIC ACID (PFDA)		1.9	U		3.3	U		1.8	U		2.1	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.9	U		3.3	U		1.8	U		2.1	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.9	U		3.3	U		1.1	J	P	2.1	J	P
PERFLUOROHEPTANOIC ACID (PFHPA)		1.9	U		3.5	J	P	1.1	J	P	10		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2.2	J	P	40			56			130		
PERFLUOROHEXANOIC ACID (PFHXA)		1.9	U		6.4	J	P	1	J	P	12		
PERFLUORONONANESULFONIC ACID (PFNS)		1.9	U		3.3	U		1.8	U		2.1	U	
PERFLUORONONANOIC ACID (PFNA)		1.9	U		3.3	U		1.8	U		1.5	J	P
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.9	U		3.3	U		1.8	U		3.8	J	P
PERFLUOROOCTANESULFONIC ACID (PFOS)		1.9	U		47			39			99		
PERFLUOROPENTANESULFONIC ACID (PFPES)		1.9	U		2	J	P	5.8			11		

PROJ_NO: 09033A	NSAMPLE	AOPC17-W3-8-070821			AOPC26-W5-3-070821			AOPC8-W1-14-070921			AOPC8-W1-19-070921		
SDG: WG10017	LAB_ID	WG10017-010			WG10017-020			WG10017-018			WG10017-015		
FRACTION: PFAS	SAMP_DATE	7/8/2021			7/8/2021			7/9/2021			7/9/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.5	U		3.8	U		3.5	U		3.5	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.5	U		3.8	U		3.5	U		3.5	U	
4:2 FLUOROTELOMER SULFONATE		3.5	U		130			3.5	U		3.5	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		4.1	J	P	4600			3.5	U		160		
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.5	U		37			3.5	U		3.5	U	
9CL-PF3ONS		3.5	U		3.8	U		3.5	U		3.5	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.5	U		3.8	U		3.5	U		3.5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.5	U		3.8	U		3.5	U		3.5	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.5	U		3.8	U		3.5	U		3.5	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		48			350			6.5			1.8	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		37			43			6.9			1.8	U	
PERFLUOROBUTANOIC ACID (PFBA)		96			580			10			1	J	P
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U		1.9	U		1.8	U		1.8	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U		1.2	J	P	1.8	U		1.8	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U		1.9	U		1.8	U		1.8	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		5.7			12			1.8	U		1.8	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		1.9	J	P	480			2.4	J	P	1.8	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		190			350			6.3			1.8	U	
PERFLUOROHEXANOIC ACID (PFHXA)		7.2			1400			26			1.8	U	
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U		1.9	U		1.8	U		1.8	U	
PERFLUORONONANOIC ACID (PFNA)		1.4	J	P	16			1.8	U		1.8	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.8	U		1.9	U		1.8	U		1.8	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		150			490			2.8	J	P	1.8	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		29			42			2.4	J	P	1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC8-W1-19-070921-FD			AOPC8-W1-1R-070921			AOPC8-W1-20-070921			AOPC8-W1-5-070921		
SDG: WG10017	LAB_ID	WG10017-016			WG10017-017			WG10017-014			WG10017-019		
FRACTION: PFAS	SAMP_DATE	7/9/2021			7/9/2021			7/9/2021			7/9/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	AOPC8-W1-19-070921											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.6	U		3.4	U		3.5	U		3.6	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.6	U		3.4	U		3.5	U		3.6	U	
4:2 FLUOROTELOMER SULFONATE		3.6	U		3.4	U		3.5	U		3.6	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		160			110			6	J	P	79		
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.6	U		3.4	U		3.5	U		3.6	U	
9CL-PF3ONS		3.6	U		3.4	U		3.5	U		3.6	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.6	U		3.4	U		3.5	U		3.6	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.6	U		3.4	U		3.5	U		3.6	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.6	U		3.4	U		3.5	U		3.6	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.8	U	A	1.7	U		110	J	D	1.8	U	A
PERFLUOROBUTANESULFONIC ACID (PFBS)		1.8	U		1.7	U		1.7	U		1.8	U	
PERFLUOROBUTANOIC ACID (PFBA)		0.92	J	P	1.7	J	P	4.4			3.7		
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U		1.7	U		1.7	U		1.8	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U		1.7	U		1.7	U		1.8	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U		1.7	U		1.7	U		1.8	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.8	U		1.7	U		1.7	U		1.8	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		1.8	U		1.7	U		2.8	J	P	1.8	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		1.8	U		1.7	U		1.4	J	P	1.4	J	P
PERFLUOROHEXANOIC ACID (PFHXA)		1.8	U		1.7	U		15			1.3	J	P
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U		1.7	U		1.7	U		1.8	U	
PERFLUORONONANOIC ACID (PFNA)		1.8	U		1.7	U		1.7	U		1.8	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.8	U		1.7	U		1.7	U		1.8	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		1.8	U		1.7	U		1.7	U		1.8	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		1.8	U		1.7	U		1.7	U		1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC9,16-W2-16-070821			ERB-01-070721			FB-01-070721			FB-02-070821		
SDG: WG10017	LAB_ID	WG10017-013			WG10017-006			WG10017-007			WG10017-012		
FRACTION: PFAS	SAMP_DATE	7/8/2021			7/8/2021			7/7/2021			7/8/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.6	U		3.8	U		5	U		5	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.6	U		3.8	U		5	U		5	U	
4:2 FLUOROTELOMER SULFONATE		3.6	U		3.8	U		5	U		5	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		54			3.8	U		5	U		5	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.6	U		3.8	U		5	U		5	U	
9CL-PF3ONS		3.6	U		3.8	U		5	U		5	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.6	U		3.8	U		5	U		5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.6	U		3.8	U		5	U		5	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.6	U		3.8	U		5	U		5	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		230			1.9	U		2.6	U		2.6	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		67			1.9	U		2.6	U		2.6	U	
PERFLUOROBUTANOIC ACID (PFBA)		46			1.9	U		2.6	U		2.6	U	
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U		1.9	U		2.6	U		2.6	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U		1.9	U		2.6	U		2.6	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U		1.9	U		2.6	U		2.6	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		15			1.9	U		2.6	U		2.6	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		39			1.9	U		2.6	U		2.6	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		500			1.9	U		2.6	U		2.6	U	
PERFLUOROHEXANOIC ACID (PFHXA)		150			1.9	U		2.6	U		2.6	U	
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U		1.9	U		2.6	U		2.6	U	
PERFLUORONONANOIC ACID (PFNA)		5.9			1.9	U		2.6	U		2.6	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.7	J	P	1.9	U		2.6	U		2.6	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		500			1.9	U		2.6	U		2.6	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		68			1.9	U		2.6	U		2.6	U	

PROJ_NO: 09033A	NSAMPLE	FB-03-070921		
SDG: WG10017	LAB_ID	WG10017-021		
FRACTION: PFAS	SAMP_DATE	7/9/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
11CL-PF3OUDS		4.1	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		4.1	U	
4:2 FLUOROTELOMER SULFONATE		4.1	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		4.1	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		4.1	U	
9CL-PF3ONS		4.1	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		4.1	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		4.1	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		4.1	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		2	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		2	U	
PERFLUOROBUTANOIC ACID (PFBA)		2	U	
PERFLUORODECANESULFONIC ACID (PFDS)		2	U	
PERFLUORODECANOIC ACID (PFDA)		2	U	
PERFLUORODODECANOIC ACID (PFDOA)		2	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		2	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		2	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2	U	
PERFLUOROHEXANOIC ACID (PFHXA)		2	U	
PERFLUORONONANESULFONIC ACID (PFNS)		2	U	
PERFLUORONONANOIC ACID (PFNA)		2	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		2	U	

PROJ_NO: 09033A	NSAMPLE	AOPC10-WGC2-12-070721			AOPC10-WGC2-12-070721-FD			AOPC10-WGC2-4-070721			AOPC10-WGC2-5-070721		
SDG: WG10017	LAB_ID	WG10017-002			WG10017-003			WG10017-004			WG10017-005		
FRACTION: PFAS	SAMP_DATE	7/7/2021			7/7/2021			7/7/2021			7/7/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF				AOPC10-WGC2-12-070721								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.8	U		1.8	U		26			2.3	J	P
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U		2.1	U		1.8	U		1.7	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U		1.8	U		1.8	U		1.8	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U		1.8	U		1.8	U		1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC10-WGC2-6-070721			AOPC16-WU5-9-070821			AOPC17-W3-1-070721			AOPC17-W3-20-070721		
SDG: WG10017	LAB_ID	WG10017-001			WG10017-011			WG10017-009			WG10017-008		
FRACTION: PFAS	SAMP_DATE	7/7/2021			7/8/2021			7/7/2021			7/7/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.9	U		6.6			1.8	U		4.8		
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.9	U		3.3	U		1.8	U		2.1	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.9	U		3.3	U		1.8	U		2.1	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.9	U		3.3	U		1.8	U		2.1	U	

PROJ_NO: 09033A	NSAMPLE	AOPC17-W3-8-070821			AOPC26-W5-3-070821			AOPC8-W1-14-070921			AOPC8-W1-19-070921		
SDG: WG10017	LAB_ID	WG10017-010			WG10017-020			WG10017-018			WG10017-015		
FRACTION: PFAS	SAMP_DATE	7/8/2021			7/8/2021			7/9/2021			7/9/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		12			1300			13			1.8	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U		1.9	U		1.8	U		1.8	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U		1.9	U		1.8	U		1.8	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U		1.9	U		1.8	U		1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC8-W1-19-070921-FD			AOPC8-W1-1R-070921			AOPC8-W1-20-070921			AOPC8-W1-5-070921		
SDG: WG10017	LAB_ID	WG10017-016			WG10017-017			WG10017-014			WG10017-019		
FRACTION: PFAS	SAMP_DATE	7/9/2021			7/9/2021			7/9/2021			7/9/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	AOPC8-W1-19-070921											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.8	U		1.7	U		4.9			1.8	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U		1.7	U		1.7	UJ	N	1.8	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U		1.7	U		1.7	U		1.8	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U		1.7	U		1.7	U		1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC9,16-W2-16-070821			ERB-01-070721			FB-01-070721			FB-02-070821		
SDG: WG10017	LAB_ID	WG10017-013			WG10017-006			WG10017-007			WG10017-012		
FRACTION: PFAS	SAMP_DATE	7/8/2021			7/8/2021			7/7/2021			7/8/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		83			1.9	U		2.6	U		2.6	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U		2.3	U		2.5	U		2.6	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U		1.9	U		2.6	U		2.6	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U		1.9	U		2.6	U		2.6	U	

PROJ_NO: 09033A	NSAMPLE	FB-03-070921		
SDG: WG10017	LAB_ID	WG10017-021		
FRACTION: PFAS	SAMP_DATE	7/9/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		2	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		2	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		2	U	

Appendix B

Results as Reported by the Laboratory

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-001
Description: AOPC10-WGC2-6-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1057
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1427	MMM	07/14/2021 1150	98815
2	SOP SPE	PFAS by ID SOP QSM B-15	1	07/21/2021 1608	MMM	07/20/2021 1145	99449

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	21		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.6	J	3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.2	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	6.8		3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.0	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		116	50-150		89	50-150
13C2_6:2FTS		127	50-150		125	50-150
13C2_8:2FTS		97	50-150		73	50-150
13C2_PFDoA		80	50-150		64	50-150
13C2_PFTeDA		76	50-150		59	50-150
13C3_PFBS		98	50-150		79	50-150
13C3_PFHxS		97	50-150		78	50-150
13C3-HFPO-DA		104	50-150		86	50-150
13C4_PFBA		88	50-150		76	50-150
13C4_PFHpA		91	50-150		76	50-150
13C5_PFHxA		92	50-150		79	50-150
13C5_PFPeA		93	50-150		76	50-150
13C6_PFDA		89	50-150		80	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-001
Description: AOPC10-WGC2-6-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1057
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		89	50-150		66	50-150
13C8_PFOA		99	50-150		80	50-150
13C8_PFOS		91	50-150		66	50-150
13C8_PFOSA		93	50-150		78	50-150
13C9_PFNA		98	50-150		73	50-150
d5-EtFOSAA		91	50-150		56	50-150
d3-MeFOSAA		87	50-150		62	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-002
Description: AOPC10-WGC2-12-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1203
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1437	MMM	07/14/2021 1150	98815

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.9	J	7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.1	J	3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.4		3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.1		3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.7		3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		110	50-150
13C2_6:2FTS		136	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBA		77	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		86	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-002
Description: AOPC10-WGC2-12-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1203
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-003
Description: AOPC10-WGC2-12-070721-FD
Matrix: Aqueous
Date Sampled: 07/07/2021 1203
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1458	MMM	07/14/2021 1150	98815
2	SOP SPE	PFAS by ID SOP QSM B-15	1	07/21/2021 1619	MMM	07/20/2021 1145	99449

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	9.9		7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.0		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.1		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	UQ	4.1	2.1	1.0	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		97	50-150		83	50-150
13C2_6:2FTS		100	50-150		83	50-150
13C2_8:2FTS		92	50-150		58	50-150
13C2_PFDoA		83	50-150	N	30	50-150
13C2_PFTeDA		75	50-150	N	18	50-150
13C3_PFBS		90	50-150		76	50-150
13C3_PFHxS		86	50-150		74	50-150
13C3-HFPO-DA		103	50-150		86	50-150
13C4_PFBA		77	50-150		68	50-150
13C4_PFHpA		89	50-150		69	50-150
13C5_PFHxA		81	50-150		70	50-150
13C5_PFPeA		87	50-150		74	50-150
13C6_PFDA		87	50-150		68	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-003
Description: AOPC10-WGC2-12-070721-FD
Matrix: Aqueous
Date Sampled: 07/07/2021 1203
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		85	50-150	N	48	50-150
13C8_PFOA		95	50-150		77	50-150
13C8_PFOS		89	50-150		69	50-150
13C8_PFOSA		106	50-150	N	48	50-150
13C9_PFNA		105	50-150		73	50-150
d5-EtFOSAA		89	50-150	N	40	50-150
d3-MeFOSAA		89	50-150		50	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-004
Description: AOPC10-WGC2-4-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1308
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1530	MMM	07/14/2021 1150	98815

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	19		7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	31		3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.4		3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	25		3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	34	Q	3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.3	J	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	12		3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	27		3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	J	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	17		3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	26		3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	34		3.6	1.8	0.91	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	160	50-150
13C2_6:2FTS		146	50-150
13C2_8:2FTS		133	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA	N	25	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		65	50-150
13C5_PFPeA		69	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		88	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-004
Description: AOPC10-WGC2-4-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1308
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		87	50-150
13C8_PFOSA		104	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-005
Description: AOPC10-WGC2-5-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1340
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1551	MMM	07/14/2021 1150	98815
2	SOP SPE	PFAS by ID SOP QSM B-15	1	07/21/2021 1629	MMM	07/20/2021 1145	99449

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.6	J	7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	J	3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4.5		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	6.1		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.1	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	11		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.3	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.3	1.7	0.82	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.4	J	3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		101	50-150		94	50-150
13C2_6:2FTS		128	50-150		130	50-150
13C2_8:2FTS		98	50-150		78	50-150
13C2_PFDoA		89	50-150		76	50-150
13C2_PFTeDA		79	50-150		76	50-150
13C3_PFBS		95	50-150		85	50-150
13C3_PFHxS		95	50-150		84	50-150
13C3-HFPO-DA		89	50-150		97	50-150
13C4_PFBA		82	50-150		71	50-150
13C4_PFHpA		92	50-150		84	50-150
13C5_PFHxA		91	50-150		88	50-150
13C5_PFPeA		93	50-150		87	50-150
13C6_PFDA		85	50-150		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-005
Description: AOPC10-WGC2-5-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1340
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		86	50-150		79	50-150
13C8_PFOA		101	50-150		91	50-150
13C8_PFOS		88	50-150		87	50-150
13C8_PFOSA		102	50-150		77	50-150
13C9_PFNA		94	50-150		81	50-150
d5-EtFOSAA		98	50-150		81	50-150
d3-MeFOSAA		97	50-150		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-006
Description: ERB-01-070721
Matrix: Aqueous
Date Sampled: 07/08/2021 0900
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1602	MMM	07/14/2021 1150	98815
2	SOP SPE	PFAS by ID SOP QSM B-15	1	07/21/2021 1640	MMM	07/20/2021 1145	99449

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		90	50-150		83	50-150
13C2_6:2FTS		136	50-150		90	50-150
13C2_8:2FTS		100	50-150		85	50-150
13C2_PFDoA		81	50-150		82	50-150
13C2_PFTeDA		79	50-150		81	50-150
13C3_PFBS		83	50-150		85	50-150
13C3_PFHxS		85	50-150		85	50-150
13C3-HFPO-DA		94	50-150		100	50-150
13C4_PFBA		87	50-150		92	50-150
13C4_PFHpA		91	50-150		87	50-150
13C5_PFHxA		82	50-150		84	50-150
13C5_PFPeA		86	50-150		85	50-150
13C6_PFDA		82	50-150		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-006
Description: ERB-01-070721			Matrix: Aqueous
Date Sampled: 07/08/2021 0900	Project Name: NASA Ames PFAS		
Date Received: 07/10/2021	Project Number: 1031G667601		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		80	50-150		85	50-150
13C8_PFOA		99	50-150		92	50-150
13C8_PFOS		87	50-150		90	50-150
13C8_PFOSA		90	50-150		77	50-150
13C9_PFNA		98	50-150		85	50-150
d5-EtFOSAA		94	50-150		84	50-150
d3-MeFOSAA		92	50-150		91	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-007
Description: FB-01-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1700
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/15/2021 1612	MMM	07/14/2021 1150	98815
2	SOP SPE	PFAS by ID SOP QSM B-15	1	07/21/2021 1712	MMM	07/20/2021 1145	99449

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.5	U	5.0	2.5	1.2	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		107	50-150		83	50-150
13C2_6:2FTS		144	50-150		116	50-150
13C2_8:2FTS		100	50-150		78	50-150
13C2_PFDoA		83	50-150		77	50-150
13C2_PFTeDA		52	50-150		54	50-150
13C3_PFBS		93	50-150		79	50-150
13C3_PFHxS		87	50-150		80	50-150
13C3-HFPO-DA		93	50-150		93	50-150
13C4_PFBA		89	50-150		85	50-150
13C4_PFHpA		86	50-150		81	50-150
13C5_PFHxA		85	50-150		77	50-150
13C5_PFPeA		92	50-150		83	50-150
13C6_PFDA		87	50-150		87	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-007
Description: FB-01-070721			Matrix: Aqueous
Date Sampled: 07/07/2021 1700	Project Name: NASA Ames PFAS		
Date Received: 07/10/2021	Project Number: 1031G667601		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		82	50-150		76	50-150
13C8_PFOA		101	50-150		85	50-150
13C8_PFOS		85	50-150		87	50-150
13C8_PFOSA		98	50-150		74	50-150
13C9_PFNA		89	50-150		76	50-150
d5-EtFOSAA		95	50-150		76	50-150
d3-MeFOSAA		92	50-150		81	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-008
Description: AOPC17-W3-20-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1445
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1658	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	14		8.4	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	12		4.2	2.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.1	J	4.2	2.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	3.8	J	4.2	2.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	11		4.2	2.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	130		4.2	2.1	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	19		4.2	2.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	10		4.2	2.1	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	12		4.2	2.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.5	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	160	B	4.2	2.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.8		4.2	2.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	99		4.2	2.1	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		105	50-150
13C2_6:2FTS		112	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		86	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		104	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-008
Description: AOPC17-W3-20-070721			Matrix: Aqueous
Date Sampled: 07/07/2021 1445		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-009
Description: AOPC17-W3-1-070721
Matrix: Aqueous
Date Sampled: 07/07/2021 1655
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1708	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	8.3		7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.0		3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.1	J	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.8		3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	56		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	15		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.1	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.0	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	44	B	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	39		3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		106	50-150
13C2_6:2FTS		116	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		86	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-009
Description: AOPC17-W3-1-070721			Matrix: Aqueous
Date Sampled: 07/07/2021 1655		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		89	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		80	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-010
Description: AOPC17-W3-8-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1035
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1719	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.1	J	7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	37		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	5.7		3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	29		3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	190		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	96		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.2		3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.4	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	48	B	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	12		3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	150		3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		107	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		84	50-150
13C7_PFUdA		86	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-010
Description: AOPC17-W3-8-070821			Matrix: Aqueous
Date Sampled: 07/08/2021 1035		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-011
Description: AOPC16-WU5-9-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1345
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1730	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	8.4	J	13	6.5	3.3	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	6.5	U	13	6.5	3.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.6		6.5	3.3	1.6	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	J	6.5	3.3	1.6	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	40		6.5	3.3	1.6	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	16		6.5	3.3	1.6	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	3.5	J	6.5	3.3	1.6	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	6.4	J	6.5	3.3	1.6	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	44	B	6.5	3.3	1.6	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	6.6		6.5	3.3	1.6	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	3.3	U	6.5	3.3	1.6	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	47		6.5	3.3	1.6	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		71	50-150
13C2_8:2FTS		61	50-150
13C2_PFDoA		56	50-150
13C2_PFTeDA		52	50-150
13C3_PFBS		60	50-150
13C3_PFHxS		61	50-150
13C3-HFPO-DA		61	50-150
13C4_PFBA		61	50-150
13C4_PFHpA		61	50-150
13C5_PFHxA		60	50-150
13C5_PFPeA		60	50-150
13C6_PFDA		53	50-150
13C7_PFUdA		57	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-011
Description: AOPC16-WU5-9-070821			Matrix: Aqueous
Date Sampled: 07/08/2021 1345		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		61	50-150
13C8_PFOS		53	50-150
13C8_PFOSA		54	50-150
13C9_PFNA		60	50-150
d5-EtFOSAA		58	50-150
d3-MeFOSAA		59	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-012
Description: FB-02-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1500
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1812	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	5.0	U	10	5.0	2.6	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		100	50-150
13C2_6:2FTS		134	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		86	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-012
Description: FB-02-070821			Matrix: Aqueous
Date Sampled: 07/08/2021 1500		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-013
Description: AOPC9,16-W2-16-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1300
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1823	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	54		7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	UQ	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	67		3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	15		3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	J	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	68		3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	500		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	46		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	39		3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	150		3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	5.9		3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	230	B	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	83		3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	500		3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	168	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-013
Description: AOPC9,16-W2-16-070821			Matrix: Aqueous
Date Sampled: 07/08/2021 1300		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-014
Description: AOPC8-W1-20-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1307
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1833	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.0	J	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.4	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.4		3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.8	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	15		3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	110	BS	3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.9		3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	UQ	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		95	50-150
13C2_6:2FTS		71	50-150
13C2_8:2FTS		65	50-150
13C2_PFDoA		60	50-150
13C2_PFTeDA	N	42	50-150
13C3_PFBS		75	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		74	50-150
13C4_PFBA		66	50-150
13C4_PFHpA		71	50-150
13C5_PFHxA		75	50-150
13C5_PFPeA		74	50-150
13C6_PFDA		63	50-150
13C7_PFUdA		61	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-014
Description: AOPC8-W1-20-070921			Matrix: Aqueous
Date Sampled: 07/09/2021 1307		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		71	50-150
13C8_PFOS		60	50-150
13C8_PFOSA		62	50-150
13C9_PFNA		67	50-150
d5-EtFOSAA		55	50-150
d3-MeFOSAA		59	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-015
Description: AOPC8-W1-19-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1400
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1905	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	160		7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.0	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		113	50-150
13C2_6:2FTS		97	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		78	50-150
13C7_PFUdA		76	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-015
Description: AOPC8-W1-19-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1400
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	50-150
13C8_PFOS		77	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		76	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-016
Description: AOPC8-W1-19-070921-FD
Matrix: Aqueous
Date Sampled: 07/09/2021 1405
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1916	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	160		7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.92	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.3	BJ	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		108	50-150
13C2_6:2FTS		101	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		93	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		77	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-016
Description: AOPC8-W1-19-070921-FD
Matrix: Aqueous
Date Sampled: 07/09/2021 1405
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		80	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-017
Description: AOPC8-W1-1R-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1320
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1926	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	110		6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.7	J	3.4	1.7	0.84	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		129	50-150
13C2_6:2FTS		109	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		67	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		79	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-017
Description: AOPC8-W1-1R-070921			Matrix: Aqueous
Date Sampled: 07/09/2021 1320		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		76	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-018
Description: AOPC8-W1-14-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1550
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1937	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.9		3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.4	J	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	6.3		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	10		3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.4	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	26		3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	6.5	B	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	13		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.8	J	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		137	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		69	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		68	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		80	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-018
Description: AOPC8-W1-14-070921			Matrix: Aqueous
Date Sampled: 07/09/2021 1550		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-019
Description: AOPC8-W1-5-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1520
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1948	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	79		7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.4	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.7		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.3	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.4	BJ	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		137	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		69	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		61	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		77	50-150
13C6_PFDA		70	50-150
13C7_PFUdA		74	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-019
Description: AOPC8-W1-5-070921			Matrix: Aqueous
Date Sampled: 07/09/2021 1520		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		77	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		71	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-020
Description: AOPC26-W5-3-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1510
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/20/2021 1551	MMM	07/19/2021 1250	99310
2	SOP SPE	PFAS by ID SOP QSM B-15	10	07/22/2021 1856	MMM	07/19/2021 1250	99310

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	37		7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4600		75	38	19	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	130		7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	43		3.7	1.9	0.93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	12		3.7	1.9	0.93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	42		3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	350		3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	580		3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.2	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	480		3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1400		37	19	9.3	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	16		3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	350		3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1300		37	19	9.3	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	490		3.7	1.9	0.93	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		100	50-150		112	50-150
13C2_6:2FTS		120	50-150		111	50-150
13C2_8:2FTS		102	50-150		122	50-150
13C2_PFDoA		77	50-150		94	50-150
13C2_PFTeDA		56	50-150		86	50-150
13C3_PFBS		88	50-150		94	50-150
13C3_PFHxS		81	50-150		94	50-150
13C3-HFPO-DA		83	50-150		116	50-150
13C4_PFBA		96	50-150		101	50-150
13C4_PFHpA		87	50-150		84	50-150
13C5_PFHxA		83	50-150		101	50-150
13C5_PFPeA		86	50-150		93	50-150
13C6_PFDA		86	50-150		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-020
Description: AOPC26-W5-3-070821
Matrix: Aqueous
Date Sampled: 07/08/2021 1510
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		87	50-150		93	50-150
13C8_PFOA		82	50-150		87	50-150
13C8_PFOS		83	50-150		97	50-150
13C8_PFOSA		85	50-150		109	50-150
13C9_PFNA		89	50-150		95	50-150
d5-EtFOSAA		94	50-150		113	50-150
d3-MeFOSAA		84	50-150		111	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG10017-021
Description: FB-03-070921
Matrix: Aqueous
Date Sampled: 07/09/2021 1540
Project Name: NASA Ames PFAS
Date Received: 07/10/2021
Project Number: 1031G667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/17/2021 1958	SES	07/16/2021 1140	99118

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		97	50-150
13C2_6:2FTS		124	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		78	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG10017-021
Description: FB-03-070921			Matrix: Aqueous
Date Sampled: 07/09/2021 1540		Project Name: NASA Ames PFAS	
Date Received: 07/10/2021		Project Number: 1031G667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Appendix C

Support Documentation

ANALYTE	ORIGINAL AOPC10-WGC2-12-070721	DUPLICATE AOPC10-WGC2-12-070721-FD	RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
6:2 FLUOROTELOMER SULFONATE (6:2FTS)	6.9	9.9	7.2	35.71	TRUE	FALSE	FALSE	FALSE
PENTADECAFLUOROOCTANOIC ACID (PFOA)	3.7	3.2	3.6	14.49	FALSE	FALSE	FALSE	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	1.1	1.2	3.6	8.70	FALSE	FALSE	FALSE	FALSE
PERFLUOROBUTANOIC ACID (PFBA)	4.1	4.1	3.6	0.00	FALSE	FALSE	FALSE	FALSE
PERFLUOROHEXANESULFONIC ACID (PFHXS)	5.4	5	3.6	7.69	FALSE	FALSE	FALSE	FALSE

ANALYTE	ORIGINAL AOPC8-W1-19-070921	DUPLICATE AOPC8-W1-19-070921-FD	RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
6:2 FLUOROTELOMER SULFONATE (6:2FTS)	160	160	3.5	0.00	FALSE	TRUE	TRUE	FALSE
PERFLUOROBUTANOIC ACID (PFBA)	1	1	3.5	0.00	FALSE	FALSE	FALSE	FALSE

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122948

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510)302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neares, Ryan Melendez, Elain McDonald		Bar Code: WG10017 K582
Project Name: NASA Ames PFAS			
Project No.: 10316667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G-Grab C-Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	5035 Kit	Fixed Filtered	PFAS (QSM B-15)									Remarks / Cont.
AOPC10-WGC2-6-070721	7/7/21	1057	G	X			2							X									
AOPC10-WGC2-12-070721	7/7/21	1203	G	X			2							X									
AOPC10-WGC2-12-070721-FD	7/7/21	1203	G	X			2							X									
AOPC10-WGC2-4-070721	7/7/21	1308	G	X			2							X									
AOPC10-WGC2-5-070721	7/7/21	1340	G	X			2							X									
~~AOPC10-W3-20-070721~~	~~7/7/21~~	~~1445~~	~~G~~	~~X~~			~~2~~							X	MJD 7/7/21								
~~AOPC10-W3-1-070721~~	~~7/7/21~~		~~G~~	~~X~~			~~2~~							X	MJD 7/7/21								
~~AOPC10-W3-8-070721~~	~~7/7/21~~		~~G~~	~~X~~			~~2~~							X	MJD 7/7/21								
ERB-01-070721	7/8/21	0900	G	X			2							X									
FB-01-070721	7/7/21	1700	G	X			2							X									

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)	Sample Disposal ☐ Return to Client ☐ Disposal by Lab	Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: E. McDonald [signature]	7/9/21		1. Received by: FedEx		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/10/21	940	4. Laboratory received by: [signature]	7/10/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 3.8 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122968

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510)302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 2 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves, Ryan Melendez, Elena McDonald [signature]		
Project Name: NASA Ames PFAS			
Project No.: 1031G667601	P.O. No.		

WG10017

KESZ

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Comp	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 KI	Field Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC17-W3-20-070721	7/7/21	1445	G	X			2							X	
AOPC17-W3-1-070721	7/7/21	1655	G	X			2							X	
AOPC17-W3-8-070821	7/8/21	1035	G	X			2							X	
AOPC16-WU5-9-070821	7/8/21	1345	G	X			2							X	
FB-02-070821	7/8/21	1500	G	X			2							X	
AOPC9,16-W2-16-070821	7/8/21	1300	G	X			2							X	
AOPC8-W1-20-070921	7/9/21	1307	G	X			6							X	MS/MSD
AOPC8-W1-19-070921	7/9/21	1400	G	X			2							X	
AOPC8-W1-19-070921-FD	7/9/21	1405	G	X			2							X	
AOPC8-W1-1R-070921	7/9/21	1320	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)	Sample Disposal ☐ Return to Client ☐ Disposal by Lab	Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: E. McDonald [signature]	7/9/21		1. Received by: FedEx		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/10/21	940	4. Laboratory received by: [signature]	7/10/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No ice Pack
Receipt Temp. 3.8 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122953

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 3 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves, Ryan Melendez, Elgin McDonald		WG10017
Project Name: NASA Ames PFAS			KES2
Project No.: 10316667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab C-Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Dispos.	H2SO4	HNO3	HCl	NaOH	5035 KV	Pres Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC8-W1-14-070921	7/9/21	1550		X			2							X	
AOPC8-W1-5-070921	7/9/21	1520		X			2							X	
AOPC26-W5-3-070821	7/8/21	1510		X			2							X	
FB-03-070921	7/9/21	1540		X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)	Sample Disposal ☐ Return to Client ☐ Disposal by Lab	Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: E. McDonald TT [signature]	7/9/21		1. Received by: Fed Ex		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: [signature]	7/10/21	940	4. Laboratory received by: [signature]	7/10/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 3.8 °C
Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Case Narrative
Tetra Tech
Lot Number: WG10017

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

The method blank associated with batch 99118 had PFOA detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for PFOA have been flagged with a "B".

For sample WG10017-003, WG10017-011 sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Surrogate recovery may be adversely affected.

6:2FTS surrogate recovery for the method blank associated with the following samples was outside the upper control limit: WG10017-001, WG10017-002, WG10017-003, WG10017-004, WG10017-005, WG10017-006, WG10017-007. This method blank did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: WG10017-004. Re-extraction (LDUP) and/or re-analysis was performed with concurring results. Both sets of data have been reported.

The continuing calibration verification (CCV) associated with samples WG10017-001, WG10017-002, WG10017-003, WG10017-004, WG10017-005, WG10017-006, WG10017-007 for analyte: GenX recovered above the upper control limit. The sample(s) associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

The PFTeDA surrogate in laboratory control sample (LCS) for prep batch 98815 recovered outside acceptance criteria. For the following samples there was an insufficient amount to perform a re-extraction or re-analysis: WG10017-002, WG10017-004. The data has been reported.

Sample WG10017-001, WG10017-020 required centrifugation prior to extraction, due to excessive solids present in the sample. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Sample concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

Surrogate recovery for the following sample was outside control limits: WG10017-003, WG10017-014. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside the upper control limit: WG10017-013. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary
Tetra Tech
Lot Number: WG10017
Project Name: NASA Ames PFAS
Project Number: 1031G667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC10-WGC2-6-070721	Aqueous	07/07/2021 1057	07/10/2021
002	AOPC10-WGC2-12-070721	Aqueous	07/07/2021 1203	07/10/2021
003	AOPC10-WGC2-12-070721-FD	Aqueous	07/07/2021 1203	07/10/2021
004	AOPC10-WGC2-4-070721	Aqueous	07/07/2021 1308	07/10/2021
005	AOPC10-WGC2-5-070721	Aqueous	07/07/2021 1340	07/10/2021
006	ERB-01-070721	Aqueous	07/08/2021 0900	07/10/2021
007	FB-01-070721	Aqueous	07/07/2021 1700	07/10/2021
008	AOPC17-W3-20-070721	Aqueous	07/07/2021 1445	07/10/2021
009	AOPC17-W3-1-070721	Aqueous	07/07/2021 1655	07/10/2021
010	AOPC17-W3-8-070821	Aqueous	07/08/2021 1035	07/10/2021
011	AOPC16-WU5-9-070821	Aqueous	07/08/2021 1345	07/10/2021
012	FB-02-070821	Aqueous	07/08/2021 1500	07/10/2021
013	AOPC9,16-W2-16-070821	Aqueous	07/08/2021 1300	07/10/2021
014	AOPC8-W1-20-070921	Aqueous	07/09/2021 1307	07/10/2021
015	AOPC8-W1-19-070921	Aqueous	07/09/2021 1400	07/10/2021
016	AOPC8-W1-19-070921-FD	Aqueous	07/09/2021 1405	07/10/2021
017	AOPC8-W1-1R-070921	Aqueous	07/09/2021 1320	07/10/2021
018	AOPC8-W1-14-070921	Aqueous	07/09/2021 1550	07/10/2021
019	AOPC8-W1-5-070921	Aqueous	07/09/2021 1520	07/10/2021
020	AOPC26-W5-3-070821	Aqueous	07/08/2021 1510	07/10/2021
021	FB-03-070921	Aqueous	07/09/2021 1540	07/10/2021

(21 samples)

PFAS by LC/MS/MS - MB

Sample ID: WQ98815-001
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/15/2021 1355
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/15/2021 1355

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS	N	153	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		66	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		108	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ98815-001
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		115	50-150
13C8_PFOS		106	50-150
13C8_PFOSA		108	50-150
13C9_PFNA		102	50-150
d5-EtFOSAA		108	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99118-001
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/17/2021 1533
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFOA	1.3	J	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/17/2021 1533

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	50-150
13C2_6:2FTS		111	50-150
13C2_8:2FTS		102	50-150
13C2_PFDoA		92	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		100	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		95	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99118-001
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		103	50-150
13C8_PFOS		92	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99310-001
Batch: 99310
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/19/2021 1250

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/21/2021 1454
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1454

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		89	50-150
13C2_6:2FTS		128	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		85	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99310-001
Batch: 99310
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/19/2021 1250

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		99	50-150
13C8_PFOS		93	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99449-001
Batch: 99449
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/20/2021 1145

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/21/2021 1319

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		112	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		92	50-150
13C2_PFTeDA		95	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		106	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		94	50-150
13C8_PFOS		100	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ98815-002
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	103	70-150	07/18/2021 1846
11Cl-PF3OUdS	15	14		1	90	70-150	07/18/2021 1846
8:2 FTS	15	16		1	106	67-138	07/18/2021 1846
6:2 FTS	15	14		1	90	64-140	07/18/2021 1846
4:2 FTS	15	14		1	92	63-143	07/18/2021 1846
GenX	32	31		1	97	70-150	07/18/2021 1846
ADONA	15	17		1	111	70-150	07/18/2021 1846
EtFOSAA	16	16		1	102	61-135	07/18/2021 1846
MeFOSAA	16	15		1	94	65-136	07/18/2021 1846
PFBS	14	14		1	98	72-130	07/18/2021 1846
PFDS	15	14		1	92	53-142	07/18/2021 1846
PFHpS	15	17		1	114	69-134	07/18/2021 1846
PFNS	15	19		1	121	69-127	07/18/2021 1846
PFOSA	16	15		1	96	67-137	07/18/2021 1846
PFPeS	15	17		1	111	71-127	07/18/2021 1846
PFHxS	15	17		1	116	68-131	07/18/2021 1846
PFBA	16	16		1	102	73-129	07/18/2021 1846
PFDA	16	18		1	110	71-129	07/18/2021 1846
PFDoA	16	16		1	101	72-134	07/18/2021 1846
PFHpA	16	17		1	104	72-130	07/18/2021 1846
PFHxA	16	18		1	111	72-129	07/18/2021 1846
PFNA	16	17		1	108	69-130	07/18/2021 1846
PFOA	16	17		1	105	71-133	07/18/2021 1846
PFPeA	16	16		1	98	72-129	07/18/2021 1846
PFTeDA	16	16		1	99	71-132	07/18/2021 1846
PFTrDA	16	11		1	67	65-144	07/18/2021 1846
PFUdA	16	15		1	96	69-133	07/18/2021 1846
PFOS	15	18		1	121	65-140	07/18/2021 1846

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	50-150
13C2_6:2FTS		148	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA	N	38	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		108	50-150
13C4_PFBA		101	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ98815-002
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	50-150
13C7_PFUdA		98	50-150
13C8_PFOA		102	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		110	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99118-002
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	102	70-150	07/17/2021 1543
11Cl-PF3OUdS	15	17		1	110	70-150	07/17/2021 1543
8:2 FTS	15	16		1	101	67-138	07/17/2021 1543
6:2 FTS	15	12		1	82	64-140	07/17/2021 1543
4:2 FTS	15	14		1	96	63-143	07/17/2021 1543
GenX	32	35		1	109	70-150	07/17/2021 1543
ADONA	15	16		1	109	70-150	07/17/2021 1543
EtFOSAA	16	18		1	114	61-135	07/17/2021 1543
MeFOSAA	16	15		1	91	65-136	07/17/2021 1543
PFBS	14	15		1	105	72-130	07/17/2021 1543
PFDS	15	14		1	91	53-142	07/17/2021 1543
PFHpS	15	17		1	113	69-134	07/17/2021 1543
PFNS	15	17		1	112	69-127	07/17/2021 1543
PFOSA	16	16		1	103	67-137	07/17/2021 1543
PFPeS	15	16		1	109	71-127	07/17/2021 1543
PFHxS	15	15		1	106	68-131	07/17/2021 1543
PFBA	16	17		1	107	73-129	07/17/2021 1543
PFDA	16	18		1	113	71-129	07/17/2021 1543
PFDoA	16	18		1	115	72-134	07/17/2021 1543
PFHpA	16	18		1	113	72-130	07/17/2021 1543
PFHxA	16	16		1	97	72-129	07/17/2021 1543
PFNA	16	17		1	104	69-130	07/17/2021 1543
PFOA	16	18		1	110	71-133	07/17/2021 1543
PFPeA	16	18		1	110	72-129	07/17/2021 1543
PFTeDA	16	17		1	107	71-132	07/17/2021 1543
PFTrDA	16	18		1	114	65-144	07/17/2021 1543
PFUdA	16	18		1	109	69-133	07/17/2021 1543
PFOS	15	15		1	104	65-140	07/17/2021 1543

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		105	50-150
13C2_6:2FTS		118	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		97	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99118-002
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		102	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99310-002
Batch: 99310
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/19/2021 1250

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	109	70-150	07/20/2021 1519
11Cl-PF3OUdS	15	15		1	99	70-150	07/20/2021 1519
8:2 FTS	15	16		1	106	67-138	07/20/2021 1519
6:2 FTS	15	14		1	94	64-140	07/20/2021 1519
4:2 FTS	15	15		1	99	63-143	07/20/2021 1519
GenX	32	39		1	122	70-150	07/20/2021 1519
ADONA	15	17		1	113	70-150	07/20/2021 1519
EtFOSAA	16	17		1	104	61-135	07/20/2021 1519
MeFOSAA	16	17		1	106	65-136	07/20/2021 1519
PFBS	14	15		1	108	72-130	07/20/2021 1519
PFDS	15	17		1	107	53-142	07/20/2021 1519
PFHpS	15	15		1	100	69-134	07/20/2021 1519
PFNS	15	17		1	109	69-127	07/20/2021 1519
PFOSA	16	17		1	105	67-137	07/20/2021 1519
PFPeS	15	17		1	113	71-127	07/20/2021 1519
PFHxS	15	14		1	99	68-131	07/20/2021 1519
PFBA	16	17		1	109	73-129	07/20/2021 1519
PFDA	16	17		1	105	71-129	07/20/2021 1519
PFDoA	16	19		1	116	72-134	07/20/2021 1519
PFHpA	16	17		1	106	72-130	07/20/2021 1519
PFHxA	16	18		1	113	72-129	07/20/2021 1519
PFNA	16	18		1	115	69-130	07/20/2021 1519
PFOA	16	17		1	105	71-133	07/20/2021 1519
PFPeA	16	18		1	112	72-129	07/20/2021 1519
PFTeDA	16	18		1	110	71-132	07/20/2021 1519
PFTrDA	16	17		1	105	65-144	07/20/2021 1519
PFUdA	16	17		1	106	69-133	07/20/2021 1519
PFOS	15	19		1	125	65-140	07/20/2021 1519

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		124	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		101	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99310-002
Batch: 99310
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/19/2021 1250

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		96	50-150
13C8_PFOS		87	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99449-002
Batch: 99449
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/20/2021 1145

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
PFTeDA	16	18		1	115	71-132	07/21/2021 1329

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		98	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCSD

Sample ID: WQ99449-003
Batch: 99449
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/20/2021 1145

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
PFTeDA	16	17		1	104	10	71-132	30	07/21/2021 1340

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		98	50-150
13C2_6:2FTS	N	157	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		97	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG10017-002MS
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	14		1	105	70-150	07/15/2021 1448
11Cl-PF3OUdS	ND	13	11		1	86	70-150	07/15/2021 1448
8:2 FTS	ND	13	14		1	102	67-138	07/15/2021 1448
6:2 FTS	6.9	13	22		1	110	64-140	07/15/2021 1448
4:2 FTS	ND	13	14		1	106	63-143	07/15/2021 1448
GenX	ND	28	34		1	122	70-150	07/15/2021 1448
ADONA	ND	13	15		1	111	70-150	07/15/2021 1448
EtFOSAA	ND	14	14		1	97	61-135	07/15/2021 1448
MeFOSAA	ND	14	14		1	98	65-136	07/15/2021 1448
PFBS	1.1	12	14		1	104	72-130	07/15/2021 1448
PFDS	ND	14	13		1	93	53-142	07/15/2021 1448
PFHpS	ND	13	13		1	99	69-134	07/15/2021 1448
PFNS	ND	13	15		1	109	69-127	07/15/2021 1448
PFOSA	ND	14	14		1	100	67-137	07/15/2021 1448
PFPeS	ND	13	14		1	108	71-127	07/15/2021 1448
PFHxS	5.4	13	19		1	104	68-131	07/15/2021 1448
PFBA	4.1	14	18		1	102	73-129	07/15/2021 1448
PFDA	ND	14	16		1	116	71-129	07/15/2021 1448
PFDoA	ND	14	14		1	98	72-134	07/15/2021 1448
PFHpA	ND	14	13		1	94	72-130	07/15/2021 1448
PFHxA	ND	14	14		1	103	72-129	07/15/2021 1448
PFNA	ND	14	13		1	91	69-130	07/15/2021 1448
PFOA	3.7	14	17		1	97	71-133	07/15/2021 1448
PFPeA	ND	14	15		1	106	72-129	07/15/2021 1448
PFTeDA	ND	14	14		1	99	71-132	07/15/2021 1448
PFTrDA	ND	14	12		1	88	65-144	07/15/2021 1448
PFUdA	ND	14	16		1	112	69-133	07/15/2021 1448
PFOS	ND	13	14		1	104	65-140	07/15/2021 1448

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		94	50-150
13C2_6:2FTS		101	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		80	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		94	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG10017-002MS
Batch: 98815
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/14/2021 1150

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	50-150
13C7_PFUdA		82	50-150
13C8_PFOA		100	50-150
13C8_PFOS		92	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		104	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG10017-014MS
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	12		1	95	70-150	07/17/2021 1844
11Cl-PF3OUdS	ND	13	12		1	89	70-150	07/17/2021 1844
8:2 FTS	ND	13	16		1	122	67-138	07/17/2021 1844
6:2 FTS	6.0	13	21		1	113	64-140	07/17/2021 1844
4:2 FTS	ND	13	12		1	90	63-143	07/17/2021 1844
GenX	ND	28	28		1	101	70-150	07/17/2021 1844
ADONA	ND	13	13		1	100	70-150	07/17/2021 1844
EtFOSAA	ND	14	14		1	99	61-135	07/17/2021 1844
MeFOSAA	ND	14	12		1	85	65-136	07/17/2021 1844
PFBS	ND	12	13		1	103	72-130	07/17/2021 1844
PFDS	ND	14	12		1	92	53-142	07/17/2021 1844
PFHpS	ND	13	13		1	100	69-134	07/17/2021 1844
PFNS	ND	14	14		1	102	69-127	07/17/2021 1844
PFOSA	ND	14	14		1	102	67-137	07/17/2021 1844
PFPeS	ND	13	13		1	100	71-127	07/17/2021 1844
PFHxS	1.4	13	15		1	104	68-131	07/17/2021 1844
PFBA	4.4	14	18		1	98	73-129	07/17/2021 1844
PFDA	ND	14	14		1	103	71-129	07/17/2021 1844
PFDoA	ND	14	15		1	109	72-134	07/17/2021 1844
PFHpA	2.8	14	16		1	96	72-130	07/17/2021 1844
PFHxA	15	14	30		1	105	72-129	07/17/2021 1844
PFNA	ND	14	14		1	101	69-130	07/17/2021 1844
PFOA	110	14	130		1	113	71-133	07/17/2021 1844
PFPeA	4.9	14	20		1	106	72-129	07/17/2021 1844
PFTeDA	ND	14	15		1	104	71-132	07/17/2021 1844
PFTrDA	ND	14	14		1	101	65-144	07/17/2021 1844
PFUdA	ND	14	15		1	105	69-133	07/17/2021 1844
PFOS	ND	13	15		1	113	65-140	07/17/2021 1844

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		121	50-150
13C2_6:2FTS		91	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		68	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		87	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG10017-014MS
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		78	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		87	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		71	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG10017-014MD
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	13	13		1	94	0.77	70-150	30	07/17/2021 1854
11Cl-PF3OUdS	ND	13	13		1	93	5.6	70-150	30	07/17/2021 1854
8:2 FTS	ND	14	14		1	100	18	67-138	30	07/17/2021 1854
6:2 FTS	6.0	14	21		1	113	0.75	64-140	30	07/17/2021 1854
4:2 FTS	ND	13	14		1	104	16	63-143	30	07/17/2021 1854
GenX	ND	29	30		1	103	3.6	70-150	30	07/17/2021 1854
ADONA	ND	13	14		1	102	3.3	70-150	30	07/17/2021 1854
EtFOSAA	ND	14	15		1	102	4.3	61-135	30	07/17/2021 1854
MeFOSAA	ND	14	16		1	113	29	65-136	30	07/17/2021 1854
PFBS	ND	13	14		1	113	11	72-130	30	07/17/2021 1854
PFDS	ND	14	13		1	95	4.8	53-142	30	07/17/2021 1854
PFHpS	ND	14	15		1	109	10	69-134	30	07/17/2021 1854
PFNS	ND	14	13		1	97	3.5	69-127	30	07/17/2021 1854
PFOSA	ND	14	15		1	106	4.9	67-137	30	07/17/2021 1854
PFPeS	ND	13	15		1	113	14	71-127	30	07/17/2021 1854
PFHxS	1.4	13	15		1	102	0.43	68-131	30	07/17/2021 1854
PFBA	4.4	14	19		1	105	6.4	73-129	30	07/17/2021 1854
PFDA	ND	14	16		1	113	11	71-129	30	07/17/2021 1854
PFDoA	ND	14	16		1	111	3.4	72-134	30	07/17/2021 1854
PFHpA	2.8	14	17		1	101	4.8	72-130	30	07/17/2021 1854
PFHxA	15	14	32		1	116	5.6	72-129	30	07/17/2021 1854
PFNA	ND	14	16		1	109	9.8	69-130	30	07/17/2021 1854
PFOA	110	14	120	N	1	41	8.4	71-133	30	07/17/2021 1854
PFPeA	4.9	14	20		1	105	0.49	72-129	30	07/17/2021 1854
PFTeDA	ND	14	15		1	107	3.6	71-132	30	07/17/2021 1854
PFTrDA	ND	14	15		1	108	8.8	65-144	30	07/17/2021 1854
PFUdA	ND	14	16		1	110	6.0	69-133	30	07/17/2021 1854
PFOS	ND	13	13		1	101	9.6	65-140	30	07/17/2021 1854

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		107	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG10017-014MD
Batch: 99118
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/16/2021 1140

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		76	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		90	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		80	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		73	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC10-WGC2-6-070721	116	127	97	80	76	98	97	104	88
AOPC10-WGC2-6-070721	89	125	73	64	59	79	78	86	76
AOPC10-WGC2-12-070721	110	136	92	81	79	90	97	103	77
AOPC10-WGC2-12-070721-FD	97	100	92	83	75	90	86	103	77
AOPC10-WGC2-12-070721-FD	83	83	58	30 *	18 *	76	74	86	68
AOPC10-WGC2-4-070721	160 *	146	133	98	79	83	89	83	25 *
AOPC10-WGC2-5-070721	101	128	98	89	79	95	95	89	82
AOPC10-WGC2-5-070721	94	130	78	76	76	85	84	97	71
ERB-01-070721	90	136	100	81	79	83	85	94	87
ERB-01-070721	83	90	85	82	81	85	85	100	92
FB-01-070721	107	144	100	83	52	93	87	93	89
FB-01-070721	83	116	78	77	54	79	80	93	85
AOPC17-W3-20-070721	105	112	97	86	76	87	83	89	104
AOPC17-W3-1-070721	106	116	98	86	79	88	87	87	92
AOPC17-W3-8-070821	107	110	96	81	79	90	90	88	100
AOPC16-WU5-9-070821	89	71	61	56	52	60	61	61	61
FB-02-070821	100	134	92	90	75	87	93	88	88
AOPC9,16-W2-16-070821	168 *	107	98	84	76	83	89	85	79
AOPC8-W1-20-070921	95	71	65	60	42 *	75	75	74	66
AOPC8-W1-19-070921	113	97	93	79	75	88	92	88	78
AOPC8-W1-19-070921-FD	108	101	94	85	78	90	92	87	78
AOPC8-W1-1R-070921	129	109	90	75	74	88	93	85	67
AOPC8-W1-14-070921	137	99	94	79	69	86	98	89	68
AOPC8-W1-5-070921	137	92	88	74	69	80	91	83	61
AOPC26-W5-3-070821	100	120	102	77	56	88	81	83	96
AOPC26-W5-3-070821	112	111	122	94	86	94	94	116	101
FB-03-070921	97	124	95	84	77	83	89	86	88
WQ98815-001	92	153 *	108	94	66	103	104	108	102
WQ98815-002	88	148	110	83	38 *	88	90	108	101
AOPC10-WGC2-12-070721MS	94	101	95	84	76	93	92	99	80

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC10-WGC2-4-070721DUP	174 *	186 *	142	99	87	90	98	86	30 *
WQ99449-001	92	112	90	92	95	81	87	106	92
WQ99449-002	88	117	92	88	86	85	89	99	90
WQ99449-003	98	157 *	83	87	92	92	89	101	95
WQ99118-001	103	111	102	92	88	92	100	98	97
WQ99118-002	105	118	94	87	91	95	97	95	97
AOPC8-W1-20-070921MS	121	91	82	78	68	88	92	86	76
AOPC8-W1-20-070921MSD	107	93	90	77	70	86	92	89	76
WQ99310-001	89	128	92	89	86	90	85	101	92
WQ99310-002	95	124	91	81	83	93	101	79	94

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC10-WGC2-6-070721	91	92	93	89	89	99	91	93	
AOPC10-WGC2-6-070721	76	79	76	80	66	80	66	78	
AOPC10-WGC2-12-070721	87	88	92	83	86	100	89	92	
AOPC10-WGC2-12-070721-FD	89	81	87	87	85	95	89	106	
AOPC10-WGC2-12-070721-FD	69	70	74	68	48 *	77	69	48 *	
AOPC10-WGC2-4-070721	90	65	69	94	88	100	87	104	
AOPC10-WGC2-5-070721	92	91	93	85	86	101	88	102	
AOPC10-WGC2-5-070721	84	88	87	93	79	91	87	77	
ERB-01-070721	91	82	86	82	80	99	87	90	
ERB-01-070721	87	84	85	91	85	92	90	77	
FB-01-070721	86	85	92	87	82	101	85	98	
FB-01-070721	81	77	83	87	76	85	87	74	
AOPC17-W3-20-070721	86	86	89	83	82	93	81	88	
AOPC17-W3-1-070721	87	90	86	81	84	90	81	89	
AOPC17-W3-8-070821	92	89	91	84	86	92	89	83	
AOPC16-WU5-9-070821	61	60	60	53	57	61	53	54	
FB-02-070821	90	89	91	83	86	96	79	92	
AOPC9,16-W2-16-070821	86	87	88	81	83	83	85	84	
AOPC8-W1-20-070921	71	75	74	63	61	71	60	62	
AOPC8-W1-19-070921	84	89	89	78	76	86	77	83	
AOPC8-W1-19-070921-FD	91	93	89	82	77	86	84	84	
AOPC8-W1-1R-070921	87	88	85	83	79	94	83	84	
AOPC8-W1-14-070921	93	91	87	82	80	89	81	82	
AOPC8-W1-5-070921	84	86	77	70	74	90	76	77	
AOPC26-W5-3-070821	87	83	86	86	87	82	83	85	
AOPC26-W5-3-070821	84	101	93	91	93	87	97	109	
FB-03-070921	85	84	87	78	84	95	81	86	
WQ98815-001	98	101	101	97	96	115	106	108	
WQ98815-002	100	95	98	95	98	102	89	101	
AOPC10-WGC2-12-070721MS	96	86	94	75	82	100	92	94	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC10-WGC2-4-070721DUP	96	68	74	111	101	104	94	120	
WQ99449-001	90	88	88	91	85	94	100	90	
WQ99449-002	84	83	89	91	88	98	94	81	
WQ99449-003	89	87	91	99	92	97	98	85	
WQ99118-001	95	92	95	93	88	103	92	90	
WQ99118-002	95	99	97	88	96	102	88	92	
AOPC8-W1-20-070921MS	83	90	87	78	78	87	78	82	
AOPC8-W1-20-070921MSD	86	86	91	76	78	90	82	80	
WQ99310-001	93	84	86	93	96	99	93	86	
WQ99310-002	95	92	92	85	94	96	87	86	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC10-WGC2-6-070721	98	91	87						0
AOPC10-WGC2-6-070721	73	56	62						0
AOPC10-WGC2-12-070721	89	87	86						0
AOPC10-WGC2-12-070721-FD	105	89	89						0
AOPC10-WGC2-12-070721-FD	73	40 *	50						5
AOPC10-WGC2-4-070721	97	101	103						2
AOPC10-WGC2-5-070721	94	98	97						0
AOPC10-WGC2-5-070721	81	81	83						0
ERB-01-070721	98	94	92						0
ERB-01-070721	85	84	91						0
FB-01-070721	89	95	92						0
FB-01-070721	76	76	81						0
AOPC17-W3-20-070721	86	77	90						0
AOPC17-W3-1-070721	84	80	85						0
AOPC17-W3-8-070821	87	87	87						0
AOPC16-WU5-9-070821	60	58	59						0
FB-02-070821	85	82	87						0
AOPC9,16-W2-16-070821	85	84	91						1
AOPC8-W1-20-070921	67	55	59						1
AOPC8-W1-19-070921	86	76	82						0
AOPC8-W1-19-070921-FD	90	80	85						0
AOPC8-W1-1R-070921	84	76	82						0
AOPC8-W1-14-070921	90	77	85						0
AOPC8-W1-5-070921	80	71	79						0
AOPC26-W5-3-070821	89	94	84						0
AOPC26-W5-3-070821	95	113	111						0
FB-03-070921	87	82	88						0
WQ98815-001	102	108	108						1
WQ98815-002	95	94	110						1
AOPC10-WGC2-12-070721MS	104	93	90						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC10-WGC2-4-070721DUP	107	126	114						3
WQ99449-001	84	93	92						0
WQ99449-002	85	90	96						0
WQ99449-003	87	89	94						1
WQ99118-001	93	83	93						0
WQ99118-002	98	89	93						0
AOPC8-W1-20-070921MS	88	71	79						0
AOPC8-W1-20-070921MSD	83	73	81						0
WQ99310-001	89	91	91						0
WQ99310-002	92	95	88						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 3
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): AOPC10-WGC2-12-070721

Instrument ID: _Sciex 4500_LCMSMS1 Lab Sample ID: WG10017-002MS

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	SAMPLE CONCENTRATION	MS CONCENTRATION	MS %REC #	QC LIMITS REC.
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	13		14	105	70-150
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	13		11	86	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	13		14	102	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	13	6.9	22	110	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	13		14	106	63-143
Hexafluoropropylene oxide dimer acid (GenX)	28		34	122	70-150
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	13		15	111	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	14		14	97	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	14		14	98	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	12	1.1	14	104	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	14		13	93	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	13		13	99	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	13		15	109	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	14		14	100	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	13		14	108	71-127
Perfluorohexanesulfonic acid (PFHxS)	13	5.4	19	104	68-131
Perfluoro-n-butanoic acid (PFBA)	14	4.1	18	102	73-129
Perfluoro-n-decanoic acid (PFDA)	14		16	116	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	14		14	98	72-134
Perfluoro-n-heptanoic acid (PFHpA)	14		13	94	72-130
Perfluoro-n-hexanoic acid (PFHxA)	14		14	103	72-129
Perfluoro-n-nonanoic acid (PFNA)	14		13	91	69-130
Perfluoro-n-octanoic acid (PFOA)	14	3.7	17	97	71-133
Perfluoro-n-pentanoic acid (PFPeA)	14		15	106	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	14		14	99	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	14		12	88	65-144
Perfluoro-n-undecanoic acid (PFUdA)	14		16	112	69-133
Perfluorooctanesulfonic acid (PFOS)	13		14	104	65-140

* Values outside of QC Limits

FORM 3
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): AOPC8-W1-20-070921

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2 Lab Sample ID: WG10017-014MS

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	SAMPLE CONCENTRATION	MS CONCENTRATION	MS %REC #	QC LIMITS REC.
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	13		12	95	70-150
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	13		12	89	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	13		16	122	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	13	6	21	113	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	13		12	90	63-143
Hexafluoropropylene oxide dimer acid (GenX)	28		28	101	70-150
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	13		13	100	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	14		14	99	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	14		12	85	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	12		13	103	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	14		12	92	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	13		13	100	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	14		14	102	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	14		14	102	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	13		13	100	71-127
Perfluorohexanesulfonic acid (PFHxS)	13	1.4	15	104	68-131
Perfluoro-n-butanoic acid (PFBA)	14	4.4	18	98	73-129
Perfluoro-n-decanoic acid (PFDA)	14		14	103	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	14		15	109	72-134
Perfluoro-n-heptanoic acid (PFHpA)	14	2.8	16	96	72-130
Perfluoro-n-hexanoic acid (PFHxA)	14	15	30	105	72-129
Perfluoro-n-nonanoic acid (PFNA)	14		14	101	69-130
Perfluoro-n-octanoic acid (PFOA)	14	110	130	113	71-133
Perfluoro-n-pentanoic acid (PFPeA)	14	4.9	20	106	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	14		15	104	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	14		14	101	65-144
Perfluoro-n-undecanoic acid (PFUdA)	14		15	105	69-133
Perfluorooctanesulfonic acid (PFOS)	13		15	113	65-140

* Values outside of QC Limits

FORM 3
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): AOPC8-W1-20-070921

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2 Lab Sample ID: WG10017-014MS

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	MSD CONCENTRATION	MSD %R #	RPD #	QC LIMITS	
					RPD	%R
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	13	13	94	0.77	0-30	70-150
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	13	13	93	5.6	0-30	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	14	14	100	18	0-30	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	14	21	113	0.75	0-30	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	13	14	104	16	0-30	63-143
Hexafluoropropylene oxide dimer acid (GenX)	29	30	103	3.6	0-30	70-150
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	13	14	102	3.3	0-30	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	14	15	102	4.3	0-30	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	14	16	113	29	0-30	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	13	14	113	11	0-30	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	14	13	95	4.8	0-30	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	14	15	109	10	0-30	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	14	13	97	3.5	0-30	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	14	15	106	4.9	0-30	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	13	15	113	14	0-30	71-127
Perfluorohexanesulfonic acid (PFHxS)	13	15	102	0.43	0-30	68-131
Perfluoro-n-butanoic acid (PFBA)	14	19	105	6.4	0-30	73-129
Perfluoro-n-decanoic acid (PFDA)	14	16	113	11	0-30	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	14	16	111	3.4	0-30	72-134
Perfluoro-n-heptanoic acid (PFHpA)	14	17	101	4.8	0-30	72-130
Perfluoro-n-hexanoic acid (PFHxA)	14	32	116	5.6	0-30	72-129
Perfluoro-n-nonanoic acid (PFNA)	14	16	109	9.8	0-30	69-130
Perfluoro-n-octanoic acid (PFOA)	14	120	41 *	8.4	0-30	71-133
Perfluoro-n-pentanoic acid (PFPeA)	14	20	105	0.49	0-30	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	14	15	107	3.6	0-30	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	14	15	108	8.8	0-30	65-144
Perfluoro-n-undecanoic acid (PFUdA)	14	16	110	6.0	0-30	69-133
Perfluorooctanesulfonic acid (PFOS)	13	13	101	9.6	0-30	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ98815-002 Lab Sample ID: WQ98815-002

Instrument ID: _Sciex 4500_LCMSMS1

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	14	90	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	16	106	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	14	90	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	14	92	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	17	111	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	15	103	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	31	97	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	16	102	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	15	94	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	14	98	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	14	92	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	17	114	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	19	121	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	15	96	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	17	111	71-127
Perfluoro-n-butanoic acid (PFBA)	16	16	102	73-129
Perfluoro-n-decanoic acid (PFDA)	16	18	110	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	16	101	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	17	104	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	18	111	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	17	108	69-130
Perfluoro-n-octanoic acid (PFOA)	16	17	105	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	16	98	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	16	99	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	11	67	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	15	96	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	17	116	68-131
Perfluorooctanesulfonic acid (PFOS)	15	18	121	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ99449-002 Lab Sample ID: WQ99449-002

Instrument ID: _Sciex 4500_LCMSMS1

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	15	102	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	16	104	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	14	90	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	16	107	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	17	115	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	16	109	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	43	133	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	17	103	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	17	103	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	15	109	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	14	94	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	16	103	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	17	108	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	17	109	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	17	116	71-127
Perfluoro-n-butanoic acid (PFBA)	16	17	109	73-129
Perfluoro-n-decanoic acid (PFDA)	16	17	105	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	17	109	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	17	104	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	16	100	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	17	108	69-130
Perfluoro-n-octanoic acid (PFOA)	16	17	104	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	17	108	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	18	115	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	16	98	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	17	107	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	15	102	68-131
Perfluorooctanesulfonic acid (PFOS)	15	15	99	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ99449-002 Lab Sample ID: WQ99449-002

Instrument ID: _Sciex 4500_LCMSMS1

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCSD CONCENTRATION	LCSD %R #	RPD #	QC LIMITS	
					RPD	%R
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	15	99	2.5	0-30	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	19	126	19	0-30	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	14	94	4.7	0-30	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	15	99	7.1	0-30	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	19	125	8.1	0-30	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	15	102	6.9	0-30	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	40	126	5.6	0-30	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	15	93	9.9	0-30	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	17	104	0.52	0-30	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	14	101	7.2	0-30	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	17	107	13	0-30	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	17	112	8.6	0-30	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	17	112	3.1	0-30	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	17	104	4.9	0-30	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	15	101	14	0-30	71-127
Perfluoro-n-butanoic acid (PFBA)	16	17	105	4.2	0-30	73-129
Perfluoro-n-decanoic acid (PFDA)	16	17	106	1.3	0-30	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	18	110	1.0	0-30	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	16	99	5.4	0-30	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	17	109	9.3	0-30	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	17	108	0.20	0-30	69-130
Perfluoro-n-octanoic acid (PFOA)	16	17	105	0.33	0-30	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	17	107	1.5	0-30	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	17	104	10	0-30	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	15	95	2.3	0-30	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	17	105	1.6	0-30	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	16	108	5.3	0-30	68-131
Perfluorooctanesulfonic acid (PFOS)	15	16	106	6.3	0-30	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ99118-002 Lab Sample ID: WQ99118-002

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	17	110	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	16	101	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	12	82	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	14	96	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	16	109	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	15	102	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	35	109	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	18	114	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	15	91	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	15	105	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	14	91	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	17	113	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	17	112	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	16	103	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	16	109	71-127
Perfluoro-n-butanoic acid (PFBA)	16	17	107	73-129
Perfluoro-n-decanoic acid (PFDA)	16	18	113	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	18	115	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	18	113	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	16	97	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	17	104	69-130
Perfluoro-n-octanoic acid (PFOA)	16	18	110	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	18	110	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	17	107	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	18	114	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	18	109	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	15	106	68-131
Perfluorooctanesulfonic acid (PFOS)	15	15	104	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG10017

Project No.: 1031G667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ99310-002 Lab Sample ID: WQ99310-002

Instrument ID: _Sciex 4500_LCMSMS1

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	15	99	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	16	106	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	14	94	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	15	99	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	17	113	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	16	109	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	39	122	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	17	104	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	17	106	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	15	108	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	17	107	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	15	100	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	17	109	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	17	105	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	17	113	71-127
Perfluoro-n-butanoic acid (PFBA)	16	17	109	73-129
Perfluoro-n-decanoic acid (PFDA)	16	17	105	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	19	116	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	17	106	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	18	113	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	18	115	69-130
Perfluoro-n-octanoic acid (PFOA)	16	17	105	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	18	112	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	18	110	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	17	105	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	17	106	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	14	99	68-131
Perfluorooctanesulfonic acid (PFOS)	15	19	125	65-140

* Values outside of QC Limits

CLIENT SAMPLE ID

WQ98815-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG10017

Project No.: 1031G667601
Lab Sample ID: WQ98815-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex 4500_LCMSMS1
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/14/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/15/2021

Time Analyzed: 13:55

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC10-WGC2-6-070721	WG10017-001		14:27
AOPC10-WGC2-12-070721	WG10017-002		14:37
AOPC10-WGC2-12-070721-FD	WG10017-003		14:58
AOPC10-WGC2-4-070721	WG10017-004		15:30
AOPC10-WGC2-5-070721	WG10017-005		15:51
ERB-01-070721	WG10017-006		16:02
FB-01-070721	WG10017-007		16:12
WQ98815-002	WQ98815-002		18:46
AOPC10-WGC2-12-070721MS	WG10017-002MS		14:48
AOPC10-WGC2-4-070721DUP	WG10017-004DU		15:41

CLIENT SAMPLE ID

WQ99449-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG10017

Project No.: 1031G667601
Lab Sample ID: WQ99449-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex 4500_LCMSMS1
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/20/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/21/2021

Time Analyzed: 13:19

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC10-WGC2-6-070721	WG10017-001		16:08
AOPC10-WGC2-12-070721-FD	WG10017-003		16:19
AOPC10-WGC2-5-070721	WG10017-005		16:29
ERB-01-070721	WG10017-006		16:40
FB-01-070721	WG10017-007		17:12
WQ99449-002	WQ99449-002		13:29
WQ99449-003	WQ99449-003		13:40

CLIENT SAMPLE ID

WQ99118-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG10017

Project No.: 1031G667601
Lab Sample ID: WQ99118-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/16/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/17/2021

Time Analyzed: 15:33

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC17-W3-20-070721	WG10017-008		16:58
AOPC17-W3-1-070721	WG10017-009		17:08
AOPC17-W3-8-070821	WG10017-010		17:19
AOPC16-WU5-9-070821	WG10017-011		17:30
FB-02-070821	WG10017-012		18:12
AOPC9,16-W2-16-070821	WG10017-013		18:23
AOPC8-W1-20-070921	WG10017-014		18:33
AOPC8-W1-19-070921	WG10017-015		19:05
AOPC8-W1-19-070921-FD	WG10017-016		19:16
AOPC8-W1-1R-070921	WG10017-017		19:26
AOPC8-W1-14-070921	WG10017-018		19:37
AOPC8-W1-5-070921	WG10017-019		19:48
FB-03-070921	WG10017-021		19:58
WQ99118-002	WQ99118-002		15:43
AOPC8-W1-20-070921MS	WG10017-014MS		18:44
AOPC8-W1-20-070921MSD	WG10017-014MD		18:54

CLIENT SAMPLE ID

WQ99310-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG10017

Project No.: 1031G667601
Lab Sample ID: WQ99310-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex 4500_LCMSMS1
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/19/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/21/2021

Time Analyzed: 14:54

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC26-W5-3-070821	WG10017-020		15:51
AOPC26-W5-3-070821	WG10017-020		18:56
WQ99310-002	WQ99310-002		15:19

Report Date: 28-Jun-2021 13:00:10 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 27-Jun-2021 11:53:05 Cal End Date: 27-Jun-2021 13:28:25

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	062721011.d	ICAL 50_SVLC-1545A	27-Jun-2021 11:53:05
2	062721012.d	ICAL 100_SVLC-1546	27-Jun-2021 12:03:36
3	062721013.d	ICAL 200_SVLC-1547	27-Jun-2021 12:14:12
4	062721014.d	ICAL 500_SVLC-1548	27-Jun-2021 12:24:48
5	062721015.d	ICAL 1000_SVLC-1549	27-Jun-2021 12:35:23
6	062721016.d	ICAL 2000_SVLC-1550	27-Jun-2021 12:45:59
7	062721017.d	ICAL 5000_SVLC-1551	27-Jun-2021 12:56:35
8	062721018.d	ICAL 10000_SVLC-1552	27-Jun-2021 13:07:10
9	062721019.d	ICAL 15000_SVLC-1553	27-Jun-2021 13:17:46
10	062721020.d	ICAL 20000_SVLC-1554	27-Jun-2021 13:28:25

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	4.663	3.623	3.655	3.770	3.532	3.829	3.836	3.804	3.587	3.633	3.793	2.513-4.550	0.33950	1.766
1 4:2 FTS	1.263	1.237	1.201	1.571	1.457	1.685	1.640	1.459	1.713	1.617	1.484	0.883-2.030	0.19103	0.728
15 PFHxA	19.887	13.960	16.097	15.351	14.920	17.926	15.330	16.175	17.633	17.888	16.516	9.511-20.328	1.80294	7.460
22 PFPeS	2.503	4.195	3.557	3.161	3.311	3.120	3.350	3.264	3.278	3.295	3.303	2.120-4.501	0.39672	1.655
28 GenX	0.791	0.561	0.736	0.696	0.670	0.670	0.685	0.764	0.695	0.713	0.698	0.490-0.849	0.05979	0.335
13 PFHpA	3.824	3.527	3.456	3.606	3.406	3.281	3.445	3.475	3.535	3.180	3.473	2.881-3.930	0.17486	1.703
14 PFHxS	3.044	3.105	3.254	3.397	3.169	3.311	3.498	3.355	3.351	3.558	3.304	2.694-3.643	0.15804	1.584
29 ADONA	2.725	2.525	2.528	2.629	2.554	2.531	2.532	2.628	2.474	2.364	2.549	2.272-2.835	0.09385	1.277
2 6:2 FTS	Disabled	1.320	1.463	1.321	1.386	1.512	1.616	1.512	1.584	1.450	1.462	1.073-1.698	0.10414	0.693
20 PFOA	2.638	2.771	2.591	2.961	2.560	2.897	2.788	2.627	2.685	2.692	2.721	2.159-2.960	0.13363	1.280
12 PFHpS	3.441	3.847	3.726	3.246	3.528	3.617	3.529	3.467	3.493	3.544	3.543	3.037-4.018	0.16360	1.764
18 PFOS	4.316	3.870	3.333	3.908	3.605	3.836	4.072	3.909	4.049	3.992	3.889	2.833-4.376	0.25702	1.802
17 PFNA	5.243	4.760	4.743	4.435	4.881	4.987	4.751	4.848	4.889	4.594	4.813	4.154-5.607	0.24214	2.440
19 PFOSA	33.668	37.104	43.847	42.277	40.768	43.206	40.966	39.380	40.983	43.445	40.564	31.650-49.885	3.03928	20.384
3 8:2 FTS	1.830	1.553	1.504	1.590	1.588	1.398	1.418	1.327	1.439	1.422	1.506	1.180-1.995	0.13591	0.794
16 PFNS	2.533	2.698	2.577	3.354	3.183	3.263	3.250	3.292	3.322	3.526	3.099	2.046-4.319	0.37886	1.591
10 PFDA	7.619	8.797	10.925	9.324	9.189	11.762	9.462	9.734	9.994	9.726	9.653	5.797-12.580	1.13041	4.594
6 N-MeFOSAA	Disabled	1.184	1.529	2.008	1.443	1.428	1.438	1.252	1.467	1.511	1.473	0.781-2.104	0.22053	0.721
9 PFDS	3.832	2.658	3.850	3.148	4.105	3.126	2.808	3.385	3.256	3.117	3.328	2.667-5.542	0.47910	2.052
25 PFUdA	7.325	9.653	10.041	9.429	10.296	9.475	10.663	10.250	9.964	10.659	9.775	7.426-13.165	0.95656	5.148
5 N-EtFOSAA	Disabled	1.609	1.593	1.828	1.983	1.883	1.772	1.819	1.762	1.809	1.784	1.620-2.346	0.12100	0.991
26 MeFOSA	1.056	1.494	1.462	0.958	1.224	1.201	1.188	1.066	1.097	1.125	1.187	0.697-1.750	0.17538	0.612
27 EtFOSA	Disabled	0.980	1.284	1.201	1.188	1.001	1.097	1.047	1.167	1.104	1.118	0.884-1.491	0.10133	0.594
11 PFDoA	8.075	7.717	7.123	8.029	7.296	7.511	7.258	7.520	7.206	7.121	7.485	6.132-8.459	0.38770	3.648
4 10:2 FTS	Disabled	1.767	2.582	2.485	2.317	2.267	2.186	2.202	2.239	2.191	2.248	1.664-2.969	0.21737	1.158
34 PFDOS	3.780	3.150	3.278	3.328	3.295	3.340	3.357	3.291	3.346	3.404	3.356	2.799-3.790	0.16511	1.647
24 PFTrDA	3.428	2.816	3.166	3.238	3.176	3.213	3.349	3.190	3.315	3.465	3.235	2.535-3.816	0.21356	1.588
23 PFTeDA	6.345	10.186	8.701	8.439	9.000	8.580	8.863	8.744	8.856	8.512	8.622	6.267-11.732	0.91079	4.500
35 PFHxDA	11.637	12.514	12.854	12.958	13.391	12.917	12.842	12.915	12.696	12.458	12.718	11.952-14.829	0.47941	6.695
36 PFODA	97.260	116.574	106.475	108.654	116.837	115.089	115.771	119.121	122.304	120.672	113.875	92.822-140.851	8.00492	58.418

Report Date: 28-Jun-2021 13:00:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 27-Jun-2021 11:53:05 Cal End Date: 27-Jun-2021 13:28:25

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	062721011.d	ICAL 50_SVLC-1545A	27-Jun-2021 11:53:05
2	062721012.d	ICAL 100_SVLC-1546	27-Jun-2021 12:03:36
3	062721013.d	ICAL 200_SVLC-1547	27-Jun-2021 12:14:12
4	062721014.d	ICAL 500_SVLC-1548	27-Jun-2021 12:24:48
5	062721015.d	ICAL 1000_SVLC-1549	27-Jun-2021 12:35:23
6	062721016.d	ICAL 2000_SVLC-1550	27-Jun-2021 12:45:59
7	062721017.d	ICAL 5000_SVLC-1551	27-Jun-2021 12:56:35
8	062721018.d	ICAL 10000_SVLC-1552	27-Jun-2021 13:07:10
9	062721019.d	ICAL 15000_SVLC-1553	27-Jun-2021 13:17:46
10	062721020.d	ICAL 20000_SVLC-1554	27-Jun-2021 13:28:25

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	957	989	968	958	960	919	928	884	841	850	Avg:A Wt:C2	926		RSD=5.5	
	103.4	106.9	104.6	103.6	103.7	99.3	100.2	95.5	90.9	91.9	Org:N Dep:R				
8 PFBA	1.052593	1.007189	1.045656	1.004579	1.000299	1.017883	0.974952	1.016599	1.020181	0.992858	Avg:A Wt:C2	1.013279		RSD=2.3	
	103.9	99.4	103.2	99.1	98.7	100.5	96.2	100.3	100.7	98	Org:N Dep:R				
D 50 13C5_PFPeA	946	963	979	1009	980	986	908	946	856	904	Avg:A Wt:C2	948		RSD=4.9	
	99.8	101.6	103.3	106.5	103.4	104.1	95.8	99.9	90.3	95.3	Org:N Dep:R				
21 PFPeA	1.071157	1.027361	1.010780	0.932603	1.015115	0.960182	1.021766	0.984719	1.013552	0.939967	Avg:A Wt:C2	0.997720		RSD=4.3	
	107.4	103	101.3	93.5	101.7	96.2	102.4	98.7	101.6	94.2	Org:N Dep:R				
D 44 13C3_PFBS	310	309	310	314	317	306	290	296	294	288	Avg:A Wt:C2	303		RSD=3.4	
	102.3	102	102.2	103.4	104.3	101	95.6	97.4	96.9	94.9	Org:N Dep:R				
7 PFBS	1.418401	1.441440	1.392650	1.375920	1.309117	1.333331	1.443780	1.389793	1.348735	1.369977	Avg:A Wt:C2	1.382315		RSD=3.2	
	102.6	104.3	100.7	99.5	94.7	96.5	104.4	100.5	97.6	99.1	Org:N Dep:R				

Report Date: 28-Jun-2021 13:00:09 AIM Revision: 2.0 19-Apr-2021 11:30:40
Method Path: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\LCMSMS01_PFAS-ID.m

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	1.992138	1.835818	1.639570	1.905467	1.468859	1.873744	1.745587	1.647760	1.585724	1.879292	Avg:A Wt:C2	1.757396		RSD=9.5	
	113.4	104.5	93.3	108.4	83.6	106.6	99.3	93.8	90.2	106.9	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	48.4130	44.2130	49.3810	45.2232	50.3552	42.3370	47.3554	42.6810	46.2500	41.7332	Avg:A Wt:C2	45.7942		RSD=6.7	
	105.7	96.5	107.8	98.8	110	92.5	103.4	93.2	101	91.1	Org:N Dep:R				
D 49 13C5_PFHxA	890	860	843	870	863	849	839	832	746	766	Avg:A Wt:C2	836		RSD=5.4	
	106.5	102.9	100.9	104.1	103.2	101.6	100.4	99.5	89.2	91.7	Org:N Dep:R				
15 PFHxA	1.073870	0.933968	0.988510	0.925575	0.944082	0.975837	0.918507	0.911630	1.040055	0.973114	Avg:A Wt:C2	0.968515		RSD=5.6	
	110.9	96.4	102.1	95.6	97.5	100.8	94.8	94.1	107.4	100.5	Org:N Dep:R				
22 PFPeS	0.957900	1.109949	1.022983	0.990182	1.006175	1.024500	1.077802	1.027331	0.940585	1.017217	Avg:A Wt:C2	1.017462		RSD=4.9	
	94.1	109.1	100.5	97.3	98.9	100.7	105.9	101	92.4	100	Org:N Dep:R				
28 GenX	0.809933	0.675225	0.690302	0.673781	0.650937	0.642858	0.672233	0.736041	0.717145	0.710586	Avg:A Wt:C2	0.697904		RSD=7.0	
	116.1	96.8	98.9	96.5	93.3	92.1	96.3	105.5	102.8	101.8	Org:N Dep:R				
D 66 13C3_GenX	172	164	172	171	179	172	159	166	149	150	Avg:A Wt:C2	165		RSD=6.1	
	103.8	98.9	103.9	103.6	108.5	104.2	95.9	100.2	90.1	91	Org:N Dep:R				
13 PFHpA	0.982476	0.934855	0.885274	0.930999	0.922708	0.911261	0.880488	0.928525	0.876973	0.911677	Avg:A Wt:C2	0.916524		RSD=3.4	
	107.2	102	96.6	101.6	100.7	99.4	96.1	101.3	95.7	99.5	Org:N Dep:R				
D 47 13C4_PFHpA	924	917	963	923	908	896	956	851	892	797	Avg:A Wt:C2	903		RSD=5.4	
	102.4	101.6	106.7	102.2	100.5	99.3	105.9	94.2	98.8	88.3	Org:N Dep:R				
D 45 13C3_PFHxS	292	282	257	293	303	279	268	257	240	246	Avg:A Wt:C2	271		RSD=7.9	
	107.4	103.7	94.6	107.8	111.6	102.7	98.8	94.7	88.3	90.4	Org:N Dep:R				
14 PFHxS	1.263003	1.012690	1.166172	1.066929	1.030534	1.061376	1.116961	1.126300	1.114092	1.159389	Avg:A Wt:C2	1.111745		RSD=6.7	
	113.6	91.1	104.9	96	92.7	95.5	100.5	101.3	100.2	104.3	Org:N Dep:R				
29 ADONA	5.484511	5.352234	5.458612	4.838549	4.595402	4.920525	5.100041	4.952857	5.166902	4.789907	Avg:A Wt:C2	5.065954		RSD=5.9	
	108.3	105.7	107.8	95.5	90.7	97.1	100.7	97.8	102	94.6	Org:N Dep:R				
2 6:2 FTS	Disabled	2.997055	2.515590	1.855814	1.844990	1.869093	1.892773	1.777701	1.687197	1.726932	Ln:A Wt:C2	1.749067	122	R^2=0.996	
	Disabled	98	107.2	91.4	98.2	103.2	106.7	100.9	96	98.4	Org:N Dep:R			RSE=5.4	
D 64 13C2_6:2 FTS_2	46.1290	46.4028	43.8636	47.9574	48.9620	45.1614	42.4068	41.9020	41.7218	39.6804	Avg:A Wt:C2	44.4187		RSD=6.8	
	103.9	104.5	98.8	108	110.2	101.7	95.5	94.3	93.9	89.3	Org:N Dep:R				
D 53 13C8_PFOA	945	984	913	939	922	894	890	846	799	838	Avg:A Wt:C2	897		RSD=6.2	
	105.4	109.6	101.7	104.7	102.7	99.7	99.3	94.3	89.1	93.5	Org:N Dep:R				
20 PFOA	1.160873	1.018742	0.978147	1.014923	0.988318	1.009839	1.009296	0.922624	0.970231	0.936284	Avg:A Wt:C2	1.000928		RSD=6.5	
	116	101.8	97.7	101.4	98.7	100.9	100.8	92.2	96.9	93.5	Org:N Dep:R				
12 PFHpS	1.010907	0.936226	1.110224	0.936771	0.904739	0.953311	0.959861	1.003253	0.993763	1.004400	Avg:A Wt:C2	0.981346		RSD=5.9	
	103	95.4	113.1	95.5	92.2	97.1	97.8	102.2	101.3	102.3	Org:N Dep:R				
D 54 13C8_PFOS	231	223	239	236	232	233	229	228	210	215	Avg:A Wt:C2	228		RSD=4.0	
	101.5	97.8	105.2	103.4	102.1	102.3	100.8	100.1	92.3	94.5	Org:N Dep:R				
18 PFOS	1.586985	1.199398	1.235652	1.129776	1.125057	1.093734	1.073383	1.093785	1.117058	1.160741	Ln:A Wt:C2	1.096116	20.3741	R^2=0.997	
	104.7	89.4	102.7	99.1	100.6	98.8	97.5	99.6	101.8	105.8	Org:N Dep:R			RSE=4.8	
D 56 13C9_PFNA	955	927	923	937	902	905	877	847	818	804	Avg:A Wt:C2	889		RSD=5.8	
	107.4	104.2	103.8	105.3	101.4	101.8	98.6	95.2	92	90.4	Org:N Dep:R				
17 PFNA	0.881032	0.818766	0.836814	0.876359	0.837424	0.849845	0.838456	0.856353	0.837950	0.849637	Avg:A Wt:C2	0.848264		RSD=2.2	
	103.9	96.5	98.7	103.3	98.7	100.2	98.8	101	98.8	100.2	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	2.890979	3.135340	2.880677	2.883318	2.793159	2.847303	2.768250	2.720740	2.920894	2.862424	Avg:A Wt:C2	2.870308		RSD=3.9	
	100.7	109.2	100.4	100.5	97.3	99.2	96.4	94.8	101.8	99.7	Org:N Dep:R				
D 55 13C8_PFOSA	487	464	456	462	459	441	445	443	430	420	Avg:A Wt:C2	451		RSD=4.3	
	108.1	103	101.2	102.5	101.9	97.8	98.7	98.4	95.3	93.1	Org:N Dep:R				
19 PFOSA	1.010480	1.076360	1.060142	0.997909	0.989037	1.047916	1.008174	0.978155	0.972829	1.048575	Avg:A Wt:C2	1.018958		RSD=3.6	
	99.2	105.6	104	97.9	97.1	102.8	98.9	96	95.5	102.9	Org:N Dep:R				
3 8:2 FTS	1.888892	1.715071	1.651784	1.606207	1.624834	1.672056	1.586730	1.363950	1.492826	1.557539	Avg:A Wt:C2	1.615989		RSD=8.6	
	116.9	106.1	102.2	99.4	100.5	103.5	98.2	84.4	92.4	96.4	Org:N Dep:R				
16 PFNS	0.842881	0.808133	0.844933	0.841268	0.822656	0.853856	0.851615	0.861448	0.856506	0.872525	Avg:A Wt:C2	0.845582		RSD=2.2	
	99.7	95.6	99.9	99.5	97.3	101	100.7	101.9	101.3	103.2	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	41.5792	36.6638	32.8992	34.0446	33.7738	31.8364	30.6464	31.1882	27.2868	26.0472	Avg:A Wt:C2	32.5966		RSD=13.7	
	127.6	112.5	100.9	104.4	103.6	97.7	94	95.7	83.7	79.9	Org:N Dep:R				
10 PFDA	0.927736	0.868976	0.927797	0.911230	0.831382	1.075928	0.894225	0.872914	0.908906	0.881596	Avg:A Wt:C2	0.910069		RSD=7.2	
	101.9	95.5	101.9	100.1	91.4	118.2	98.3	95.9	99.9	96.9	Org:N Dep:R				
D 51 13C6_PFDA	846	823	809	812	831	725	719	709	660	649	Avg:A Wt:C2	758		RSD=9.8	
	111.5	108.5	106.7	107.1	109.6	95.6	94.8	93.5	87.1	85.6	Org:N Dep:R				
D 58 d3-MeFOSAA	242	192	200	196	188	190	197	201	189	204	Avg:A Wt:C2	200		RSD=7.8	
	121	96.1	99.8	97.8	94.2	95.1	98.7	100.7	94.7	102	Org:N Dep:R				
6 N-MeFOSAA	Disabled	0.740346	0.822299	0.896491	0.816093	0.774616	0.736952	0.641871	0.756543	0.730177	Avg:A Wt:C2	0.768377		RSD=9.3	
	Disabled	96.4	107	116.7	106.2	100.8	95.9	83.5	98.5	95	Org:N Dep:R				
9 PFDS	1.149562	0.955763	0.990397	1.010628	1.100439	0.923554	0.962761	0.945314	0.941967	0.930622	Avg:A Wt:C2	0.991101		RSD=7.7	
	116	96.4	99.9	102	111	93.2	97.1	95.4	95	93.9	Org:N Dep:R				
25 PFUdA	0.954936	0.872766	0.890098	0.892113	0.806033	0.875219	0.905063	0.883134	0.846160	0.901234	Avg:A Wt:C2	0.882675		RSD=4.4	
	108.2	98.9	100.8	101.1	91.3	99.2	102.5	100.1	95.9	102.1	Org:N Dep:R				
D 60 d5-EtFOSAA	Disabled	208	198	188	191	175	171	173	162	150	Avg:A Wt:C2	180		RSD=10.2	
	Disabled	116	110.3	104.5	106.5	97.5	95.2	96.5	90	83.4	Org:N Dep:R				
D 52 13C7_PFUdA	827	815	801	776	803	743	708	685	662	654	Avg:A Wt:C2	747		RSD=8.8	
	110.6	109	107.1	103.8	107.5	99.4	94.8	91.7	88.5	87.5	Org:N Dep:R				
5 N-EtFOSAA	Disabled	1.072038	1.037255	0.938656	0.988060	1.003784	0.969565	0.980698	0.965844	1.033490	Avg:A Wt:C2	0.998821		RSD=4.2	
	Disabled	107.3	103.8	94	98.9	100.5	97.1	98.2	96.7	103.5	Org:N Dep:R				
D 61 d7-MeFOSE	191	191	164	174	176	176	164	159	162	181	Avg:A Wt:C2	174		RSD=6.7	
	110	109.9	94.3	100	101.4	101.2	94.4	91.2	93.3	104.2	Org:N Dep:R				
32 MeFOSE	0.745931	0.843794	0.892708	0.944907	0.945082	0.894548	0.973316	0.978631	0.916975	0.868647	Avg:A Wt:C2	0.900454		RSD=7.8	
	82.8	93.7	99.1	104.9	105	99.3	108.1	108.7	101.8	96.5	Org:N Dep:R				
26 MeFOSA	1.165919	1.086384	1.317508	0.962238	1.143411	1.017265	1.066825	1.033258	0.894357	0.905911	Avg:A Wt:C2	1.059308		RSD=12.1	
	110.1	102.6	124.4	90.8	107.9	96	100.7	97.5	84.4	85.5	Org:N Dep:R				
D 57 d3-MeFOSA	55.5270	61.1570	53.9010	65.3560	62.2060	62.1490	63.5090	58.8790	69.0930	70.8220	Avg:A Wt:C2	62.2599		RSD=8.6	
	89.2	98.2	86.6	105	99.9	99.8	102	94.6	111	113.8	Org:N Dep:R				
31 11Cl-PF3OUDS	2.770778	2.691936	2.532011	2.552310	2.543535	2.390562	2.528633	2.537973	2.528410	2.561858	Avg:A Wt:C2	2.563801		RSD=4.0	
	108.1	105	98.8	99.6	99.2	93.2	98.6	99	98.6	99.9	Org:N Dep:R				
D 62 d9-EtFOSE	182	165	171	139	157	157	152	151	149	161	Avg:A Wt:C2	158		RSD=7.7	
	115.1	104.2	107.7	87.6	99.1	99	95.7	95.4	94.3	101.7	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	0.794851	0.879439	0.818832	0.939726	0.824884	0.799807	0.843984	0.808955	0.827630	0.828060	Avg:A Wt:C2	0.836617		RSD=5.2	
	95	105.1	97.9	112.3	98.6	95.6	100.9	96.7	98.9	99	Org:N Dep:R				
D 59 d5-EtFOSA	63.7660	62.5570	65.1930	63.3020	64.1100	61.6780	59.0920	60.6000	53.0620	57.0840	Avg:A Wt:C2	61.0444		RSD=6.1	
	104.5	102.5	106.8	103.7	105	101	96.8	99.3	86.9	93.5	Org:N Dep:R				
27 EtFOSA	Disabled	0.945058	1.035847	1.128495	1.037607	0.944064	1.053564	1.002772	1.134933	1.060800	Avg:A Wt:C2	1.038127		RSD=6.6	
	Disabled	91	99.8	108.7	99.9	90.9	101.5	96.6	109.3	102.2	Org:N Dep:R				
D 38 13C2_PFDoA	935	823	823	755	788	788	729	711	706	683	Avg:A Wt:C2	774		RSD=9.7	
	120.8	106.3	106.4	97.5	101.8	101.8	94.2	91.9	91.1	88.2	Org:N Dep:R				
11 PFDoA	1.121898	0.926838	0.909864	1.046039	0.944524	0.964535	0.951569	0.955708	0.884228	0.917523	Avg:A Wt:C2	0.962273		RSD=7.4	
	116.6	96.3	94.6	108.7	98.2	100.2	98.9	99.3	91.9	95.3	Org:N Dep:R				
4 10:2 FTS	Disabled	1.859444	2.368135	1.966361	1.997700	1.851025	1.872808	1.817104	2.018919	2.065511	Avg:A Wt:C2	1.979667		RSD=8.5	
	Disabled	93.9	119.6	99.3	100.9	93.5	94.6	91.8	102	104.3	Org:N Dep:R				
34 PFDOS	0.961656	0.944395	0.842479	0.848244	0.856198	0.843079	0.836298	0.840707	0.887245	0.896448	Avg:A Wt:C2	0.875675		RSD=5.2	
	109.8	107.8	96.2	96.9	97.8	96.3	95.5	96	101.3	102.4	Org:N Dep:R				
24 PFTrDA	0.426176	0.407092	0.401622	0.428914	0.426828	0.394059	0.447196	0.428291	0.422391	0.458970	Avg:A Wt:C2	0.424154		RSD=4.7	
	100.5	96	94.7	101.1	100.6	92.9	105.4	101	99.6	108.2	Org:N Dep:R				
D 42 13C2_PFTeDA	872	840	857	865	844	811	799	825	769	786	Avg:A Wt:C2	827		RSD=4.2	
	105.4	101.6	103.6	104.6	102.1	98.1	96.7	99.8	93	95	Org:N Dep:R				
23 PFTeDA	0.752542	0.946303	0.847963	0.771766	0.805303	0.793455	0.820684	0.774525	0.766026	0.762213	Avg:A Wt:C2	0.804078		RSD=7.2	
	93.6	117.7	105.5	96	100.2	98.7	102.1	96.3	95.3	94.8	Org:N Dep:R				
D 40 13C2_PFHxDA	548	527	522	536	524	510	506	492	457	481	Avg:A Wt:C2	510		RSD=5.4	
	107.4	103.2	102.3	105	102.8	99.9	99.2	96.5	89.5	94.2	Org:N Dep:R				
35 PFHxDA	1.794765	1.600392	1.609103	1.510009	1.527702	1.497490	1.486896	1.473687	1.482287	1.405152	Avg:A Wt:C2	1.538748		RSD=7.0	
	116.6	104	104.6	98.1	99.3	97.3	96.6	95.8	96.3	91.3	Org:N Dep:R				
36 PFODA	1.185742	1.210909	1.228068	1.144597	1.177592	1.199523	1.231634	1.205004	1.278311	1.233120	Avg:A Wt:C2	1.209450		RSD=3.0	
	98	100.1	101.5	94.6	97.4	99.2	101.8	99.6	105.7	102	Org:N Dep:R				

Report Date: 28-Jun-2021 13:00:10 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 27-Jun-2021 11:53:05 Cal End Date: 27-Jun-2021 13:28:25

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	062721011.d	ICAL 50_SVLC-1545A	27-Jun-2021 11:53:05
2	062721012.d	ICAL 100_SVLC-1546	27-Jun-2021 12:03:36
3	062721013.d	ICAL 200_SVLC-1547	27-Jun-2021 12:14:12
4	062721014.d	ICAL 500_SVLC-1548	27-Jun-2021 12:24:48
5	062721015.d	ICAL 1000_SVLC-1549	27-Jun-2021 12:35:23
6	062721016.d	ICAL 2000_SVLC-1550	27-Jun-2021 12:45:59
7	062721017.d	ICAL 5000_SVLC-1551	27-Jun-2021 12:56:35
8	062721018.d	ICAL 10000_SVLC-1552	27-Jun-2021 13:07:10
9	062721019.d	ICAL 15000_SVLC-1553	27-Jun-2021 13:17:46
10	062721020.d	ICAL 20000_SVLC-1554	27-Jun-2021 13:28:25

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	792892	706646	780161	761263	762145	727601	763445	600148	716291	648479	5.00
* 39 13C2_PFHxA	836660	802809	792964	814316	811375	796967	799866	772737	752472	746880	2.83
* 41 13C2_PFOA	943235	934491	925735	964448	957960	917002	922494	837147	802315	834568	3.05
* 43 13C3_PFBA	928270	899028	916702	926071	930655	886888	863037	847691	818295	821980	3.03
* 48 13C4_PFOS	244244	205110	253420	242770	240599	236066	236697	238819	209033	219958	2.61

13C2_PFDA ((|648479 - 792892| / (648479 + 792892)) / 2) * 100 = 5.01

13C2_PFHxA ((|746880 - 836660| / (746880 + 836660)) / 2) * 100 = 2.83

13C2_PFOA ((|834568 - 943235| / (834568 + 943235)) / 2) * 100 = 3.06

13C3_PFBA ((|821980 - 928270| / (821980 + 928270)) / 2) * 100 = 3.04

13C4_PFOS ((|219958 - 244244| / (219958 + 244244)) / 2) * 100 = 2.62

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 27-Jun-2021 11:53:05 Cal End Date: 27-Jun-2021 13:28:25
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	062721011.d	ICAL 50_SVLC-1545A	27-Jun-2021 11:53:05
2	062721012.d	ICAL 100_SVLC-1546	27-Jun-2021 12:03:36
3	062721013.d	ICAL 200_SVLC-1547	27-Jun-2021 12:14:12
4	062721014.d	ICAL 500_SVLC-1548	27-Jun-2021 12:24:48
5	062721015.d	ICAL 1000_SVLC-1549	27-Jun-2021 12:35:23
6	062721016.d	ICAL 2000_SVLC-1550	27-Jun-2021 12:45:59
7	062721017.d	ICAL 5000_SVLC-1551	27-Jun-2021 12:56:35
8	062721018.d	ICAL 10000_SVLC-1552	27-Jun-2021 13:07:10
9	062721019.d	ICAL 15000_SVLC-1553	27-Jun-2021 13:17:46
10	062721020.d	ICAL 20000_SVLC-1554	27-Jun-2021 13:28:25

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	957407	989050	967957	958491	960189	919465	927772	883716	841413	850280	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	50388	99616	202430	481440	960476	1871816	4522666	8983846	12875909	16884140	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	945856	963069	979333	1009362	979583	986357	908258	946461	855833	903539	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	50658	98942	197978	470667	994389	1894164	4640134	9319979	13011470	16985936	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	310336	309394	310096	313610	316591	306417	290095	295634	294017	287832	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	19456	39424	76352	190724	366378	722326	1851244	3632092	5258268	6971633	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	4504	7581	15124	40242	69083	148186	386036	656864	1027490	1465051	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	242065	221065	246905	226116	251776	211685	236777	213405	231250	208666	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	889661	860351	843198	869747	862788	849219	839149	831518	745630	766202	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	836660	802809	792964	814316	811375	796967	799866	772737	752472	746880	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	47769	80354	166702	402508	814543	1657399	3853821	7580371	11632447	14912044	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	13942	32212	59511	145639	298796	588922	1466399	2848837	3891031	5492698	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	13910	22093	47424	115392	233637	443041	1065866	2439627	3204701	4277406	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	858713	817986	858754	856302	897310	861468	792780	828631	744782	752443	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	45396	85756	170462	429578	837511	1633399	4209270	7898758	11737432	14533958	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	924114	917319	962764	922832	907666	896230	956122	850678	892269	797100	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	291630	281548	256809	292669	303002	278762	268276	257079	239591	245539	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	16759	25946	54506	142077	284151	538486	1363425	2634887	3643544	5181090	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	75334	141951	264103	666980	1311656	2584199	6444309	11994256	17492139	22157893	
2 6:2 FTS	Disabled	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	Disabled	13184	20921	42186	85637	160043	380463	706158	1000987	1299241	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	230645	232014	219318	239787	244810	225807	212034	209510	208609	198402	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	943235	934491	925735	964448	957960	917002	922494	837147	802315	834568	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	945495	983615	912608	938956	921507	894423	890381	845781	799285	838476	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	54880	100205	178533	476484	910742	1806447	4493290	7803382	11632371	15701027	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	14033	25094	54286	130502	260979	505982	1225737	2455354	3400019	4695634	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	231028	222813	239473	235567	232494	233030	229436	228009	210250	215152	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	244244	205110	253420	242770	240599	236066	236697	238819	209033	219958	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	17012	24800	54920	123488	242736	473044	1142705	2314366	3269272	4635094	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	954858	926993	922887	936927	901596	905123	876949	846536	818044	804075	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	42063	75899	154457	410542	755018	1538429	3676416	7249338	10282202	13663432	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	31124	65109	128587	316514	605234	1236777	2959735	5781691	8585370	11479562	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	487135	464343	456203	461878	459073	440596	444701	443395	429657	419591	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	24612	49980	96728	230456	454040	923415	2241681	4337091	6269740	8799455	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	3762	6024	10412	26193	52572	101993	232926	407525	585354	777312	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	9347	17286	38849	95124	183612	382030	937878	1885611	2593157	3604330	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	207896	183319	164496	170223	168869	159182	153232	155941	136434	130236	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	792892	706646	780161	761263	762145	727601	763445	600148	716291	648479	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	39233	71489	150071	369888	691205	1560233	3213277	6189240	9004034	11442124	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	845779	822681	808749	811843	831393	725064	718673	709032	660430	648944	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1209277	960497	997964	977678	941259	950971	986247	1006890	946705	1019892	
6 N-MeFOSAA	Disabled	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	Disabled	14222	32825	87648	153631	294655	726817	1292586	2148670	2978808	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	12801	20529	45727	114750	246635	414936	1064700	2077806	2863783	3860340	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	39475	71128	142515	346171	647317	1300164	3205447	6053068	8397419	11785813	
D 60 d5-EtFOSAA	Disabled	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	Disabled	1041661	990186	938182	956597	875614	854946	866790	808437	748961	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	826757	814972	800558	776070	803090	742765	708337	685408	661610	653871	
5 N-EtFOSAA	Disabled	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	Disabled	22334	41083	88063	189035	351571	828926	1700119	2342471	3096175	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	191251	191030	163861	173833	176335	175990	164183	158504	162273	181217	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	7133	16119	29256	82128	166651	314863	799010	1551170	2232005	3148272	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	3237	6644	14203	31444	71127	126444	338765	608372	926907	1283169	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	55527	61157	53901	65356	62206	62149	63509	58879	69093	70822	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	30150	56501	114236	283184	557058	1049525	2732551	5451173	7511483	10384399	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	182399	165128	170676	138817	156993	156864	151643	151181	149418	161193	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	7249	14522	27951	65225	129501	250922	639921	1222987	1854942	2669548	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	63766	62557	65193	63302	64110	61678	59092	60600	53062	57084	
27 EtFOSA	Disabled	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	Disabled	5912	13506	35718	66521	116456	311286	607680	903327	1211094	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	935201	823229	823436	754771	788291	787965	729246	711401	705502	683040	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	52460	76300	149843	394760	744560	1520039	3469639	6798916	9357373	12534100	
4 10:2 FTS	Disabled	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	Disabled	6572	15021	32267	65041	113617	276643	546320	796599	1037279	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	10753	20369	39059	96712	192691	380352	928684	1855547	2708609	3734012	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	19928	33513	66142	161866	336465	621009	1630581	3046868	4469962	6269893	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	871606	839541	856541	864589	844286	810905	799172	825280	768768	785663	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	32796	79446	145263	333630	679906	1286834	3279338	6391998	8833442	11976855	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	547927	526596	521946	535773	524461	509907	506199	492468	456805	480834	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	49170	84276	167973	404511	801220	1527161	3763326	7257436	10156743	13512893	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	32485	63766	128197	306622	617601	1223290	3117260	5934258	8759086	11858520	

Report Date: 28-Jun-2021 13:00:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 27-Jun-2021 11:53:05 Cal End Date: 27-Jun-2021 13:28:25

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	062721011.d	ICAL 50_SVLC-1545A	27-Jun-2021 11:53:05
2	062721012.d	ICAL 100_SVLC-1546	27-Jun-2021 12:03:36
3	062721013.d	ICAL 200_SVLC-1547	27-Jun-2021 12:14:12
4	062721014.d	ICAL 500_SVLC-1548	27-Jun-2021 12:24:48
5	062721015.d	ICAL 1000_SVLC-1549	27-Jun-2021 12:35:23
6	062721016.d	ICAL 2000_SVLC-1550	27-Jun-2021 12:45:59
7	062721017.d	ICAL 5000_SVLC-1551	27-Jun-2021 12:56:35
8	062721018.d	ICAL 10000_SVLC-1552	27-Jun-2021 13:07:10
9	062721019.d	ICAL 15000_SVLC-1553	27-Jun-2021 13:17:46
10	062721020.d	ICAL 20000_SVLC-1554	27-Jun-2021 13:28:25

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.700	1.700	1.700	1.700	1.700	1.699	1.700	1.700	1.700	1.700	1.699	0.019
8 PFBA	1.700	1.706	1.706	1.706	1.706	1.706	1.700	1.700	1.700	1.700	1.703	0.206
D 50 13C5_PFPeA	2.066	2.066	2.066	2.066	2.066	2.066	2.056	2.066	2.066	2.056	2.064	0.221
21 PFPeA	2.066	2.066	2.066	2.066	2.066	2.066	2.066	2.066	2.066	2.056	2.065	0.166
D 44 13C3_PFBS	2.119	2.119	2.119	2.119	2.118	2.118	2.119	2.118	2.118	2.118	2.118	0.000
7 PFBS	2.119	2.119	2.119	2.119	2.118	2.118	2.119	2.118	2.118	2.118	2.118	0.000
1 4:2 FTS	2.397	2.397	2.397	2.397	2.397	2.396	2.397	2.388	2.397	2.388	2.395	0.155
D 63 13C2_4:2 FTS_2	2.397	2.397	2.397	2.397	2.397	2.396	2.397	2.388	2.388	2.388	2.394	0.175
D 49 13C5_PFHxA	2.441	2.440	2.432	2.432	2.440	2.440	2.432	2.431	2.432	2.432	2.435	0.186
* 39 13C2_PFHxA	2.441	2.440	2.440	2.440	2.440	2.440	2.432	2.440	2.432	2.432	2.437	0.176
15 PFHxA	2.441	2.440	2.440	2.440	2.440	2.440	2.432	2.431	2.432	2.432	2.436	0.188
22 PFPeS	2.475	2.475	2.475	2.475	2.466	2.466	2.467	2.466	2.466	2.466	2.470	0.192
28 GenX	2.562	2.562	2.562	2.562	2.553	2.553	2.553	2.553	2.553	2.553	2.556	0.171
D 66 13C3_GenX	2.562	2.553	2.553	2.553	2.553	2.553	2.553	2.553	2.553	2.553	2.554	0.113
13 PFHpA	2.818	2.818	2.818	2.818	2.818	2.818	2.818	2.818	2.818	2.809	2.817	0.100
D 47 13C4_PFHpA	2.818	2.818	2.818	2.818	2.818	2.818	2.818	2.818	2.809	2.809	2.816	0.132
D 45 13C3_PFHxS	2.836	2.836	2.836	2.836	2.836	2.835	2.827	2.836	2.827	2.827	2.833	0.151
14 PFHxS	2.836	2.836	2.836	2.836	2.836	2.835	2.836	2.836	2.827	2.827	2.833	0.136
29 ADONA	2.862	2.862	2.862	2.862	2.862	2.853	2.854	2.853	2.853	2.853	2.857	0.170
2 6:2 FTS	Disabled	3.177	3.170	3.183	3.176	3.173	3.177	3.170	3.170	3.164	3.173	0.178
D 64 13C2_6:2 FTS_2	3.177	3.177	3.177	3.170	3.176	3.173	3.170	3.170	3.164	3.170	3.172	0.133
* 41 13C2_PFOA	3.202	3.202	3.202	3.202	3.196	3.198	3.196	3.195	3.196	3.196	3.198	0.109
D 53 13C8_PFOA	3.202	3.208	3.202	3.202	3.202	3.198	3.196	3.195	3.196	3.189	3.199	0.169
20 PFOA	3.202	3.208	3.202	3.202	3.202	3.198	3.202	3.195	3.202	3.196	3.201	0.123
12 PFHpS	3.209	3.208	3.208	3.209	3.208	3.204	3.209	3.202	3.202	3.202	3.206	0.104
D 54 13C8_PFOS	3.572	3.572	3.572	3.572	3.572	3.575	3.572	3.564	3.563	3.563	3.569	0.118
* 48 13C4_PFOS	3.579	3.579	3.572	3.572	3.572	3.567	3.572	3.564	3.571	3.563	3.571	0.154
18 PFOS	3.572	3.572	3.572	3.572	3.572	3.575	3.572	3.572	3.571	3.563	3.570	0.087
D 56 13C9_PFNA	3.579	3.579	3.579	3.579	3.579	3.575	3.572	3.572	3.571	3.570	3.575	0.123
17 PFNA	3.579	3.579	3.579	3.579	3.579	3.575	3.572	3.572	3.571	3.570	3.575	0.123
30 9Cl-PF3ONS	3.775	3.782	3.774	3.775	3.774	3.777	3.774	3.774	3.768	3.768	3.774	0.110
D 55 13C8_PFOSA	3.855	3.863	3.863	3.863	3.863	3.866	3.855	3.855	3.863	3.855	3.859	0.107
19 PFOSA	3.863	3.855	3.855	3.863	3.863	3.858	3.863	3.862	3.855	3.855	3.859	0.090

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
3 8:2 FTS	3.916	3.915	3.908	3.908	3.908	3.911	3.908	3.908	3.908	3.908	3.909	0.082
16 PFNS	3.908	3.908	3.908	3.908	3.908	3.903	3.900	3.900	3.900	3.901	3.904	0.095
D 65 13C2_8:2 FTS_2	3.908	3.908	3.908	3.916	3.908	3.911	3.908	3.900	3.908	3.901	3.907	0.112
* 37 13C2_PFDA	3.916	3.915	3.915	3.916	3.915	3.918	3.916	3.908	3.915	3.916	3.915	0.071
10 PFDA	3.916	3.923	3.915	3.916	3.915	3.918	3.916	3.915	3.915	3.916	3.916	0.059
D 51 13C6_PFDA	3.916	3.915	3.915	3.916	3.915	3.911	3.916	3.915	3.915	3.908	3.914	0.066
D 58 d3-MeFOSAA	4.069	4.077	4.069	4.069	4.077	4.070	4.069	4.068	4.069	4.069	4.070	0.082
6 N-MeFOSAA	Disabled	4.077	4.077	4.077	4.077	4.070	4.069	4.068	4.069	4.069	4.072	0.103
9 PFDS	4.208	4.208	4.208	4.208	4.200	4.202	4.200	4.200	4.200	4.200	4.203	0.105
25 PFUdA	4.226	4.226	4.226	4.226	4.217	4.219	4.217	4.225	4.217	4.217	4.221	0.108
D 60 d5-EtFOSAA	Disabled	4.226	4.226	4.226	4.225	4.227	4.217	4.225	4.226	4.217	4.223	0.098
D 52 13C7_PFUdA	4.217	4.226	4.226	4.226	4.225	4.219	4.217	4.217	4.217	4.217	4.220	0.107
5 N-EtFOSAA	Disabled	4.235	4.235	4.235	4.225	4.227	4.226	4.225	4.226	4.226	4.229	0.115
D 61 d7-MeFOSE	4.282	4.282	4.282	4.282	4.282	4.284	4.282	4.282	4.282	4.282	4.282	0.013
32 MeFOSE	4.292	4.291	4.292	4.292	4.291	4.293	4.292	4.291	4.291	4.292	4.291	0.015
26 MeFOSA	4.301	4.310	4.301	4.301	4.300	4.302	4.301	4.300	4.301	4.301	4.301	0.066
D 57 d3-MeFOSA	4.292	4.301	4.301	4.301	4.300	4.302	4.301	4.300	4.301	4.301	4.299	0.069
31 11Cl-PF3OUDS	4.365	4.365	4.365	4.365	4.365	4.358	4.356	4.356	4.356	4.357	4.361	0.103
D 62 d9-EtFOSE	4.443	4.443	4.443	4.443	4.443	4.444	4.443	4.443	4.443	4.443	4.442	0.009
33 EtFOSE	4.457	4.450	4.457	4.457	4.456	4.457	4.457	4.456	4.456	4.457	4.455	0.051
D 59 d5-EtFOSA	4.465	4.465	4.465	4.465	4.464	4.466	4.465	4.464	4.465	4.465	4.464	0.007
27 EtFOSA	Disabled	4.465	4.473	4.473	4.473	4.474	4.473	4.473	4.473	4.473	4.471	0.063
D 38 13C2_PFDoA	4.498	4.489	4.489	4.489	4.489	4.482	4.489	4.489	4.489	4.481	4.488	0.097
11 PFDoA	4.489	4.489	4.489	4.489	4.489	4.490	4.489	4.489	4.489	4.481	4.488	0.057
4 10:2 FTS	Disabled	4.497	4.506	4.506	4.497	4.498	4.497	4.497	4.497	4.498	4.499	0.077
34 PFDOS	4.700	4.700	4.700	4.700	4.699	4.701	4.692	4.699	4.692	4.693	4.697	0.074
24 PFTrDA	4.727	4.726	4.727	4.727	4.726	4.721	4.720	4.726	4.720	4.721	4.724	0.063
D 42 13C2_PFTeDA	4.949	4.941	4.941	4.941	4.941	4.942	4.941	4.941	4.941	4.933	4.940	0.082
23 PFTeDA	4.949	4.941	4.941	4.941	4.941	4.942	4.941	4.941	4.941	4.933	4.940	0.082
D 40 13C2_PFHxDA	5.331	5.331	5.322	5.322	5.322	5.325	5.322	5.322	5.322	5.314	5.323	0.093
35 PFHxDA	5.331	5.331	5.331	5.331	5.331	5.325	5.322	5.322	5.322	5.322	5.327	0.079
36 PFODA	5.701	5.701	5.694	5.694	5.693	5.689	5.686	5.686	5.686	5.679	5.691	0.119

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721011.d
Injection Date: 27-Jun-2021 11:53:05 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 1 Auto Sampler: 32
Sample Info: ICAL 50_SVLC-1545A Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.700	3	957407	20	>100:1			1000.00	1034.39	99.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.700	1.706	3/0	50388	17	24:1			50.000	51.940		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	3	945856	16	>100:1			1000.00	997.99	96.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	3/0	50658	16	51:1			50.000	53.680		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.119	2.118	3	310336	15	>100:1			1000.00	1022.85	98	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.119	2.118	3/0	19456	15	>100:1	Target = 3.79		44.200	45.354		
298.9 > 99	44	2.119	2.118		4172	15	30:1	4.66 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.475	2.466	5/2	13942	15	>100:1	Target = 3.30		46.900	44.154		
349 > 99	44	2.467	2.466		5570	17	64:1	2.50 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.397	5	242065	18	>100:1			5000.00	5285.93	96.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.397	1/-4	4504	13	77:1	Target = 1.48		46.700	52.938		M
327 > 81	63	2.406	2.397		3566	10	29:1	1.26 (0.74-2.22)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.440	5	889661	18	>100:1			1000.00	1064.51	103.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.440	5/0	47769	17	55:1	Target = 16.51		50.000	55.439		
313 > 119	49	2.441	2.440		2402	15	7.3:1	19.88 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.562	2.553	5	858713	19	>100:1			5000.00	5192.26	95.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.562	2.553	5/0	13910	17	62:1	Target = 0.69		100.00	116.05		
285 > 185	66	2.562	2.553		17579	17	57:1	0.79 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	6	924114	17	>100:1			1000.00	1023.71	101.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	6/0	45396	17	73:1	Target = 3.47		50.000	53.598		
363 > 169	47	2.818	2.818		11870	16	32:1	3.82 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	6	291630	18	>100:1			1000.00	1074.18	96.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	6/0	16759	26	>100:1	Target = 3.30		45.500	51.691		M
399 > 99	45	2.836	2.836		5504	21	43:1	3.04 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.862	6/0	75334	18	>100:1	Target = 2.54		47.100	50.991		
377 > 85	45	2.862	2.862		27640	17	>100:1	2.72 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.209	3.208	7/1	14033	28	77:1	Target = 3.54		47.600	49.034		
449 > 99	45	3.196	3.208		4077	26	32:1	3.44 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.177	3.176	5	230645	22	>100:1			5000.00	5192.52	94.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.177	3.176	5/0	10925	24	67:1	Target = 1.46		47.400	65.910		
427 > 81	64	3.177	3.176		8266	17	84:1	1.32 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.202	7	945495	22	>100:1			1000.00	1054.00	102.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.202	7/0	54880	20	32:1	Target = 2.72		50.000	57.990		
413 > 169	53	3.202	3.202		20799	22	68:1	2.63 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.572	3.572	7	231028	19	>100:1			1000.00	1014.50	99.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.572	3.572	1/-6	17012	39	>100:1	Target = 3.88	0.19	46.400	48.592		M
499 > 99	54	3.572	3.572		3941	35	28:1	4.31 (1.94-5.83)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.774	6/-1	31124	26	>100:1			46.600	46.936		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.908	6/-1	9347	27	66:1	Target = 3.09		48.000	47.847		
549 > 99	54	3.908	3.908		3689	20	21:1	2.53 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.200	5/-2	12801	14	98:1	Target = 3.32		48.200	55.906		
599 > 99	54	4.208	4.200		3340	20	16:1	3.83 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.365	5/-2	30150	16	>100:1			47.100	50.902		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.700	4.699	1/-6	10753	19	83:1	Target = 3.35		48.400	53.152		
699 > 99	54	4.707	4.699		2844	16		3.78 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.579	3.579	7	954858	20	>100:1			1000.00	1073.60	105.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.579	3.579	7/0	42063	17	88:1	Target = 4.81		50.000	51.931		
463 > 169	56	3.579	3.579		8022	14	88:1	5.24 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.863	6	487135	19	>100:1			1000.00	1080.94	106.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.863	1/-5	24612	15	66:1	Target = 40.56		50.000	49.584		
498>478	55	3.855	3.863		731	11	9.0:1	33.66 (20.28-60.84)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	6	207896	18	>100:1			5000.00	6377.85	123.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.916	3.908	6/0	3762	21	28:1	Target = 1.50		47.900	55.989		
527 > 81	65	3.908	3.908		2055	19	23:1	1.83 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.506	4.497	5/-1	8676	16	97:1	Target = 2.24		48.200	105.40		
627 > 80	65	4.498	4.497		3661	19	30:1	2.36 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.915	6	845779	18	>100:1			1000.00	1115.42	101.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.916	3.915	6/0	39233	19	62:1	Target = 9.65		50.000	50.971		
513 > 169	51	3.916	3.915		5149	15	15:1	7.61 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.077	5	1209277	17	>100:1			5000.00	6047.97	128.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	6/1	13014	31	73:1	Target = 1.47	0.16	50.000	70.029		
570 > 483	58	4.069	4.077		6508	32	36:1	1.99 (0.73-2.21)	0.17				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.226	4.225	5	1361712	17	>100:1			5000.00	7582.50	142.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.226	4.225	1/-4	15360	31	57:1	Target = 1.78	0.14	50.000	56.466		M
584 > 526	60	4.235	4.225		8539	33	32:1	1.79 (0.89-2.67)	0.10				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.217	4.225	5	826757	15	>100:1			1000.00	1106.26	102.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.226	4.217	5/0	39475	19	82:1	Target = 9.77		50.000	54.093		
563 > 169	52	4.226	4.217		5389	22	34:1	7.32 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	2	191251	16	>100:1			1000.00	1100.11	108.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.291	3/1	7133	18	18:1			50.000	41.420		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.292	4.300	5	55527	14	>100:1			1000.00	891.86	89.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.300	5/0	3237	11	19:1	Target = 1.18		50.000	55.032		
512 > 219	57	4.292	4.300		3065	14	21:1	1.05 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	5	182399	17	>100:1			1000.00	1151.28	116.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	6/1	7249	19	43:1			50.000	47.504		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	6	63766	16	>100:1			1000.00	1044.58	99.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.465	4.473	5/-1	4848	23	35:1	Target = 1.11		50.000	73.236		
526 > 219	59	4.457	4.473		3536	25	17:1	1.37 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.498	4.489	5	935201	18	>100:1			1000.00	1207.95	118.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.489	4.489	1/-4	52460	17	43:1	Target = 7.48		50.000	58.294		M
613 > 169	38	4.489	4.489		6496	19	81:1	8.07 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.727	4.726	3/-2	19928	18	96:1	Target = 3.23		50.000	50.238		
663 > 169	38	4.727	4.726		5813	23	43:1	3.42 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.949	4.941	2	871606	17	>100:1			1000.00	1054.40	103.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.949	4.941	3/1	32796	16	82:1	Target = 8.62		50.000	46.795		
713 > 169	42	4.949	4.941		5168	16	27:1	6.34 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.331	5.322	1	547927	16	>100:1			1000.00	1073.75	104.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.331	5.331	1/0	49170	17	>100:1	Target = 12.71		50.000	58.319		
813 > 269	40	5.331	5.331		4225	21	58:1	11.63 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.701	5.693	1/0	32485	21	>100:1	Target = 113.87		50.000	49.020		
913 > 319	40	5.708	5.693		334	20	18:1	97.26 (56.93-170.81)					M
*** 37 13C2_PFDA**													
515 > 470		3.916	3.915	6	792892	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.440	5	836660	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.196	7	943235	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.700	3	928270	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.579	3.572	7	244244	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721012.d
Injection Date: 27-Jun-2021 12:03:36 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 2 Auto Sampler: 33
Sample Info: ICAL 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.700	0	989050	19	>100:1			1000.00	1068.58	103	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.706	1/1	99616	19	47:1			100.00	99.399		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	0	963069	16	>100:1			1000.00	1016.15	98.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	0/0	98942	15	>100:1			100.00	102.97		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.119	2.118	0	309394	15	>100:1			1000.00	1019.75	97.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.119	2.118	0/0	39424	15	>100:1	Target = 3.79		88.400	92.181		
298.9 > 99	44	2.119	2.118		10880	16	60:1	3.62 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.475	2.466	0/0	32212	20	>100:1	Target = 3.30		93.800	102.33		
349 > 99	44	2.466	2.466		7677	22	78:1	4.19 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.397	0	221065	17	>100:1			5000.00	4827.36	87.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.397	1/1	7581	23	>100:1	Target = 1.48		93.400	97.568		
327 > 81	63	2.397	2.397		6127	11	69:1	1.23 (0.74-2.22)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.440	2.440	0	860351	19	>100:1			1000.00	1029.44	99.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.440	2.440	0/0	80354	16	92:1	Target = 16.51		100.00	96.433		
313 > 119	49	2.440	2.440		5756	16	25:1	13.96 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	0	817986	18	>100:1			5000.00	4946.00	91.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.562	2.553	0/0	22093	16	>100:1	Target = 0.69		200.00	193.50		
285 > 185	66	2.553	2.553		39345	21	>100:1	0.56 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	917319	19	>100:1			1000.00	1016.18	101.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	85756	19	>100:1	Target = 3.47		100.00	102.00		
363 > 169	47	2.818	2.818		24310	14	>100:1	3.52 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	281548	17	>100:1			1000.00	1037.05	92.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	6/6	25946	25	>100:1	Target = 3.30		91.000	82.892		M
399 > 99	45	2.836	2.836		8355	22	63:1	3.10 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.862	0/0	141951	20	>100:1	Target = 2.54		94.200	99.523		
377 > 85	45	2.862	2.862		56206	19	>100:1	2.52 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.208	0/0	25094	21	>100:1	Target = 3.54		95.200	90.823		
449 > 99	45	3.215	3.208		6522	27	52:1	3.84 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.177	3.176	0	232014	21	>100:1			5000.00	5223.34	94.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.177	3.176	0/0	13184	19	>100:1	Target = 1.46		94.800	92.944		
427 > 81	64	3.177	3.176		9981	22	90:1	1.32 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.202	1	983615	23	>100:1			1000.00	1096.50	106.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.202	1/0	100205	20	62:1	Target = 2.72		100.00	101.78		
413 > 169	53	3.202	3.202		36151	22	92:1	2.77 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.572	3.572	0	222813	20	>100:1			1000.00	978.43	95.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.572	3.572	0/0	24800	40	92:1	Target = 3.88	0.26	92.800	82.957		
499 > 99	54	3.579	3.572		6408	35	53:1	3.87 (1.94-5.83)	0.10				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.782	3.774	1/1	65109	28	>100:1			93.200	101.81		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.908	0/0	17286	20	66:1	Target = 3.09		96.000	91.748		
549 > 99	54	3.908	3.908		6405	14	22:1	2.69 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.200	0/0	20529	13	>100:1	Target = 3.32		96.400	92.963		
599 > 99	54	4.208	4.200		7722	20	27:1	2.65 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.365	0/0	56501	15	>100:1			94.200	98.908		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.700	4.699	0/0	20369	24	>100:1	Target = 3.35		96.800	104.40		
699 > 99	54	4.700	4.699		6466	22	74:1	3.15 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.579	3.579	0	926993	19	>100:1			1000.00	1042.27	102.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.579	3.579	0/0	75899	20	>100:1	Target = 4.81		100.00	96.523		
463 > 169	56	3.579	3.579		15942	18	99:1	4.76 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.863	1	464343	18	>100:1			1000.00	1030.37	101.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.863	0/-1	49980	17	86:1	Target = 40.56		100.00	105.63		
498>478	55	3.855	3.863		1347	20	8.9:1	37.10 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	0	183319	20	>100:1			5000.00	5623.88	108.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.915	3.908	0/0	6024	24	36:1	Target = 1.50		95.800	101.67		
527 > 81	65	3.915	3.908		3878	20	30:1	1.55 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.497	4.497	0/0	6572	21	84:1	Target = 2.24		96.400	90.546		
627 > 80	65	4.497	4.497		3719	20	31:1	1.76 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.915	3.915	0	822681	19	>100:1			1000.00	1084.96	99	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.923	3.915	1/1	71489	17	>100:1	Target = 9.65		100.00	95.485		
513 > 169	51	3.915	3.915		8126	14	52:1	8.79 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.077	1	960497	16	>100:1			5000.00	4803.74	102	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	1/0	14222	30	43:1	Target = 1.47		100.00	96.352		M
570 > 483	58	4.077	4.077		12007	26	72:1	1.18 (0.73-2.21)	0.15				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.226	4.225	0	1041661	17	>100:1			5000.00	5800.34	108.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.225	1/1	22334	33	>100:1	Target = 1.78	0.08	100.00	107.33		M
584 > 526	60	4.235	4.225		13873	30	50:1	1.60 (0.89-2.67)	0.19				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.226	4.225	1	814972	16	>100:1			1000.00	1090.49	101.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.226	4.217	0/-1	71128	16	>100:1	Target = 9.77		100.00	98.877		
563 > 169	52	4.226	4.217		7368	14	65:1	9.65 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	0	191030	19	>100:1			1000.00	1098.84	108.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.291	0/0	16119	15	38:1			100.00	93.708		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.300	1	61157	14	>100:1			1000.00	982.29	98.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.310	4.300	1/0	6644	12	58:1	Target = 1.18		100.00	102.56		
512 > 219	57	4.310	4.300		4446	10	30:1	1.49 (0.59-1.78)					M
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	0	165128	16	>100:1			1000.00	1042.27	105.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.450	4.456	0/0	14522	13	76:1			100.00	105.12		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	0	62557	18	>100:1			1000.00	1024.78	97.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.465	4.473	0/0	5912	15	55:1	Target = 1.11		100.00	91.035		
526 > 219	59	4.473	4.473		6032	17	55:1	0.98 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.489	4.489	0	823229	16	>100:1			1000.00	1063.32	104.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.489	4.489	0/0	76300	16	47:1	Target = 7.48		100.00	96.318		
613 > 169	38	4.497	4.489		9886	21	76:1	7.71 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.726	4.726	0/0	33513	19	>100:1	Target = 3.23		100.00	95.977		
663 > 169	38	4.726	4.726		11897	20	>100:1	2.81 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.941	4.941	0	839541	17	>100:1			1000.00	1015.61	99.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.941	4.941	0/0	79446	18	12:1	Target = 8.62		100.00	117.69		
713 > 169	42	4.949	4.941		7799	22	61:1	10.18 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.331	5.322	0	526596	17	>100:1			1000.00	1031.95	100.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.331	5.331	0/0	84276	17	8.7:1	Target = 12.71		100.00	104.01		
813 > 269	40	5.331	5.331		6734	24	>100:1	12.51 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.701	5.693	0/0	63766	22	8.4:1	Target = 113.87		100.00	100.12		
913 > 319	40	5.694	5.693		547	18	30:1	116.57 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.915	3.915	0	706646	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.440	2.440	0	802809	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.196	0	934491	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.700	0	899028	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.579	3.572	0	205110	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721013.d
Injection Date: 27-Jun-2021 12:14:12 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 3 Auto Sampler: 34
Sample Info: ICAL 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.700	1	967957	20	>100:1			1000.00	1045.79	100.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.706	1/0	202430	19	>100:1			200.00	206.39		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	1	979333	16	>100:1			1000.00	1033.31	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	1/0	197978	16	>100:1			200.00	202.62		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.119	2.118	1	310096	15	>100:1			1000.00	1022.06	97.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.119	2.118	1/0	76352	18	>100:1	Target = 3.79		176.80	178.12		
298.9 > 99	44	2.119	2.118		20887	16	>100:1	3.65 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.475	2.466	1/0	59511	16	>100:1	Target = 3.30		187.60	188.62		
349 > 99	44	2.466	2.466		16726	15	>100:1	3.55 (1.65-4.95)					M
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.397	1	246905	19	>100:1			5000.00	5391.62	98.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.397	1/0	15124	17		Target = 1.48		186.80	174.28		
327 > 81	63	2.397	2.397		12586	19	46:1	1.20 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.440	0	843198	18	>100:1			1000.00	1008.92	97.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.440	2.440	1/1	166702	17	>100:1	Target = 16.51		200.00	204.13		
313 > 119	49	2.440	2.440		10356	16	49:1	16.09 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	0	858754	18	>100:1			5000.00	5192.50	95.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.562	2.553	1/1	47424	18	>100:1	Target = 0.69		400.00	395.64		
285 > 185	66	2.553	2.553		64434	16	>100:1	0.73 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	962764	18	>100:1			1000.00	1066.53	106.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	170462	20	>100:1	Target = 3.47		200.00	193.18		
363 > 169	47	2.818	2.818		49318	16	>100:1	3.45 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	256809	19	>100:1			1000.00	945.92	84.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	5/4	54506	26	>100:1	Target = 3.30	0.18	182.00	190.91		
399 > 99	45	2.836	2.836		16747	25	>100:1	3.25 (1.65-4.95)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.862	1/0	264103	17	>100:1	Target = 2.54		188.40	203.00		
377 > 85	45	2.862	2.862		104443	18	>100:1	2.52 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.208	1/0	54286	27	>100:1	Target = 3.54		190.40	215.40		
449 > 99	45	3.215	3.208		14566	21	>100:1	3.72 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.177	3.176	1	219318	23	>100:1			5000.00	4937.51	89.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.170	3.176	0/-1	20921	21	>100:1	Target = 1.46		189.60	203.19		
427 > 81	64	3.177	3.176		14295	20	87:1	1.46 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.202	0	912608	22	>100:1			1000.00	1017.34	99	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.202	0/0	178533	22	>100:1	Target = 2.72		200.00	195.45		
413 > 169	53	3.202	3.202		68893	20	>100:1	2.59 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.572	3.572	1	239473	20	>100:1			1000.00	1051.59	103	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.572	3.572	1/0	54920	38	>100:1	Target = 3.88	0.23	185.60	190.64		
499 > 99	54	3.572	3.572		16473	34	96:1	3.33 (1.94-5.83)	0.10				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.774	3.774	0/-1	128587	18	>100:1			186.40	187.07		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.908	1/0	38849	17	>100:1	Target = 3.09		192.00	191.85		
549 > 99	54	3.915	3.908		15074	26	>100:1	2.57 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.200	1/0	45727	15	>100:1	Target = 3.32		192.80	192.66		
599 > 99	54	4.200	4.200		11875	14		3.85 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.365	1/0	114236	16	>100:1			188.40	186.06		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.700	4.699	1/0	39059	20	>100:1	Target = 3.35		193.60	186.26		
699 > 99	54	4.700	4.699		11913	17	>100:1	3.27 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.579	3.579	1	922887	20	>100:1			1000.00	1037.65	102.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.579	3.579	1/0	154457	19	>100:1	Target = 4.81		200.00	197.30		
463 > 169	56	3.572	3.579		32565	19	>100:1	4.74 (2.40-7.21)					M
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.863	1	456203	19	>100:1			1000.00	1012.31	99.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.863	0/-1	96728	20	>100:1	Target = 40.56		200.00	208.08		
498>478	55	3.848	3.863		2206	19	18:1	43.84 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	1	164496	18	>100:1			5000.00	5046.42	97.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.908	1/0	10412	12	57:1	Target = 1.50		191.60	195.84		M
527 > 81	65	3.900	3.908		6919	14		1.50 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.506	4.497	1/0	15021	24	89:1	Target = 2.24		192.80	230.63		
627 > 80	65	4.506	4.497		5816	17	44:1	2.58 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.915	3.915	1	808749	18	>100:1			1000.00	1066.59	97.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.915	3.915	0/-1	150071	17	>100:1	Target = 9.65		200.00	203.90		
513 > 169	51	3.923	3.915		13736	16	86:1	10.92 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.077	0	997964	16	>100:1			5000.00	4991.13	106	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	1/1	32825	32	>100:1	Target = 1.47		200.00	214.04		M
570 > 483	58	4.077	4.077		21468	31	>100:1	1.52 (0.73-2.21)					M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.226	4.225	1	990186	17	>100:1			5000.00	5513.71	103.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.225	1/0	41083	34	>100:1	Target = 1.78		200.00	207.70		M
584 > 526	60	4.235	4.225		25780	32	75:1	1.59 (0.89-2.67)	0.20				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.226	4.225	1	800558	16	>100:1			1000.00	1071.20	99.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.226	4.217	1/0	142515	16	>100:1	Target = 9.77		200.00	201.68		
563 > 169	52	4.217	4.217		14193	24	87:1	10.04 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	1	163861	15	>100:1			1000.00	942.55	92.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.291	1/0	29256	15	>100:1			200.00	198.28		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.300	1	53901	11	>100:1			1000.00	865.74	86.6	M
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.300	1/0	14203	13	62:1	Target = 1.18		200.00	248.75		M
512 > 219	57	4.301	4.300		9711	12	77:1	1.46 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	170676	23	>100:1			1000.00	1077.29	108.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	27951	18	94:1			200.00	195.75		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	65193	15	>100:1			1000.00	1067.96	101.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	13506	22	65:1	Target = 1.11		200.00	199.56		
526 > 219	59	4.481	4.473		10511	19	71:1	1.28 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.489	4.489	0	823436	17	>100:1			1000.00	1063.58	104.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.489	4.489	1/1	149843	16	72:1	Target = 7.48		200.00	189.11		
613 > 169	38	4.489	4.489		21035	17	>100:1	7.12 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.727	4.726	1/1	66142	19	>100:1	Target = 3.23		200.00	189.38		
663 > 169	38	4.727	4.726		20886	18	>100:1	3.16 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.941	4.941	0	856541	17	>100:1			1000.00	1036.18	101.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.941	4.941	0/0	145263	16	20:1	Target = 8.62		200.00	210.92		
713 > 169	42	4.941	4.941		16694	25	>100:1	8.70 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.322	5.322	0	521946	17	>100:1			1000.00	1022.84	99.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.331	5.331	1/1	167973	17	20:1	Target = 12.71		200.00	209.14		
813 > 269	40	5.331	5.331		13067	16	>100:1	12.85 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.694	5.693	0/0	128197	22	19:1	Target = 113.87		200.00	203.08		
913 > 319	40	5.694	5.693		1204	28	62:1	106.47 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.915	3.915	1	780161	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.440	2.440	1	792964	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.196	1	925735	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.700	1	916702	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.572	3.572	0	253420	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721014.d
Injection Date: 27-Jun-2021 12:24:48 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 4 Auto Sampler: 35
Sample Info: ICAL 500_SVLC-1548 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.700	1	958491	19	>100:1			1000.00	1035.56	99.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.706	1/0	481440	20	>100:1			500.00	495.71		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	1	1009362	16	>100:1			1000.00	1064.99	103	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	1/0	470667	17	>100:1			500.00	467.37		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.119	2.118	1	313610	15	>100:1			1000.00	1033.64	99.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.119	2.118	1/0	190724	15	>100:1	Target = 3.79		442.00	439.96		
298.9 > 99	44	2.119	2.118		50583	15	>100:1	3.77 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.475	2.466	1/0	145639	17	>100:1	Target = 3.30		469.00	456.42		
349 > 99	44	2.475	2.466		46068	24	>100:1	3.16 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.397	1	226116	17	>100:1			5000.00	4937.66	89.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.397	1/0	40242	24	>100:1	Target = 1.48		467.00	506.35		
327 > 81	63	2.397	2.397		25604	19	>100:1	1.57 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.440	0	869747	18	>100:1			1000.00	1040.68	100.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.440	2.440	1/1	402508	19	>100:1	Target = 16.51		500.00	477.83		
313 > 119	49	2.440	2.440		26220	16	>100:1	15.35 (8.25-24.77)					M
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	0	856302	18	>100:1			5000.00	5177.68	95.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.562	2.553	1/1	115392	18	>100:1	Target = 0.69		1000.00	965.43		
285 > 185	66	2.553	2.553		165740	18	>100:1	0.69 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	922832	17	>100:1			1000.00	1022.29	101.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	429578	18	>100:1	Target = 3.47		500.00	507.90		
363 > 169	47	2.818	2.818		119126	18	>100:1	3.60 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	292669	17	>100:1			1000.00	1078.01	96.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	6/5	142077	31	>100:1	Target = 3.30		455.00	436.66		M
399 > 99	45	2.836	2.836		41813	25	>100:1	3.39 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.862	1/0	666980	18	>100:1	Target = 2.54		471.00	449.86		
377 > 85	45	2.862	2.862		253690	18	>100:1	2.62 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.209	3.208	1/0	130502	22	>100:1	Target = 3.54		476.00	454.38		
449 > 99	45	3.209	3.208		40200	26	>100:1	3.24 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.170	3.176	0	239787	23	>100:1			5000.00	5398.33	97.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.183	3.176	1/1	42186	23	>100:1	Target = 1.46		474.00	433.43		
427 > 81	64	3.177	3.176		31928	20	>100:1	1.32 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.202	0	938956	21	>100:1			1000.00	1046.71	101.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.202	0/0	476484	21	>100:1	Target = 2.72		500.00	506.99		
413 > 169	53	3.202	3.202		160911	20	>100:1	2.96 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.572	3.572	1	235567	21	>100:1			1000.00	1034.44	101.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.572	3.572	1/0	123488	42	>100:1	Target = 3.88	0.11	464.00	459.66		M
499 > 99	54	3.572	3.572		31596	42	>100:1	3.90 (1.94-5.83)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.774	0/-1	316514	19	>100:1			466.00	468.11		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.908	1/0	95124	17	>100:1	Target = 3.09		480.00	477.55		
549 > 99	54	3.908	3.908		28359	20	>100:1	3.35 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.200	1/0	114750	22	>100:1	Target = 3.32		482.00	491.50		
599 > 99	54	4.208	4.200		36441	22	>100:1	3.14 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.365	1/0	283184	15	>100:1			471.00	468.89		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.700	4.699	1/0	96712	18	>100:1	Target = 3.35		484.00	468.84		
699 > 99	54	4.700	4.699		29054	19	>100:1	3.32 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.579	3.579	1	936927	20	>100:1			1000.00	1053.44	103.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.579	3.579	1/0	410542	20	>100:1	Target = 4.81		500.00	516.56		
463 > 169	56	3.579	3.579		92567	21	>100:1	4.43 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.863	1	461878	19	>100:1			1000.00	1024.90	100.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.863	1/0	230456	18	>100:1	Target = 40.56		500.00	489.67		
498>478	55	3.870	3.863		5451	19	34:1	42.27 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.916	3.908	1	170223	19	>100:1			5000.00	5222.12	100.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.908	0/-1	26193	18	>100:1	Target = 1.50		479.00	476.10		
527 > 81	65	3.908	3.908		16471	24	>100:1	1.59 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.506	4.497	1/0	32267	15	>100:1	Target = 2.24		482.00	478.76		
627 > 80	65	4.498	4.497		12983	23	>100:1	2.48 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.915	1	811843	18	>100:1			1000.00	1070.67	97.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.916	3.915	0/-1	369888	18	>100:1	Target = 9.65		500.00	500.64		
513 > 169	51	3.916	3.915		39667	16	>100:1	9.32 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.077	0	977678	17	>100:1			5000.00	4889.67	103.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	1/1	87648	30	>100:1	Target = 1.47		500.00	583.37		M
570 > 483	58	4.077	4.077		43647	30	>100:1	2.00 (0.73-2.21)	0.20				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.226	4.225	1	938182	18	>100:1			5000.00	5224.14	98.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.225	1/0	88063	36	>100:1	Target = 1.78	0.12	500.00	469.88		M
584 > 526	60	4.226	4.225		48163	31	>100:1	1.82 (0.89-2.67)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.226	4.225	1	776070	16	>100:1			1000.00	1038.44	96.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.226	4.217	1/0	346171	17	>100:1	Target = 9.77		500.00	505.35		
563 > 169	52	4.226	4.217		36711	20	>100:1	9.42 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	1	173833	14	>100:1			1000.00	999.92	98.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.291	1/0	82128	16	>100:1			500.00	524.68		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.300	1	65356	13	>100:1			1000.00	1049.73	105.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.300	0/-1	31444	15	58:1	Target = 1.18		500.00	454.18		
512 > 219	57	4.310	4.300		32792	14	>100:1	0.95 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	138817	17	>100:1			1000.00	876.20	88.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	65225	17	>100:1			500.00	561.62		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	63302	15	>100:1			1000.00	1036.98	98.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	35718	15	>100:1	Target = 1.11		500.00	543.52		
526 > 219	59	4.473	4.473		29734	14	>100:1	1.20 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.489	4.489	0	754771	17	>100:1			1000.00	974.89	95.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.489	4.489	1/1	394760	18	>100:1	Target = 7.48		500.00	543.53		
613 > 169	38	4.489	4.489		49166	13	>100:1	8.02 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.727	4.726	1/1	161866	18	>100:1	Target = 3.23		500.00	505.61		
663 > 169	38	4.727	4.726		49981	19	>100:1	3.23 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.941	4.941	0	864589	17	>100:1			1000.00	1045.91	102.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.941	4.941	0/0	333630	17	46:1	Target = 8.62		500.00	479.91		
713 > 169	42	4.941	4.941		39530	16	>100:1	8.43 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.322	5.322	0	535773	17	>100:1			1000.00	1049.93	102.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.331	5.331	1/1	404511	18	44:1	Target = 12.71		500.00	490.66		
813 > 269	40	5.331	5.331		31217	18	>100:1	12.95 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.694	5.693	0/0	306622	22	41:1	Target = 113.87		500.00	473.19		
913 > 319	40	5.701	5.693		2822	28	>100:1	108.65 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.916	3.915	1	761263	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.440	2.440	1	814316	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.196	1	964448	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.700	1	926071	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.572	3.572	0	242770	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721015.d
Injection Date: 27-Jun-2021 12:35:23 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 5 Auto Sampler: 36
Sample Info: ICAL 1000_SVLC-1549 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.700	1	960189	19	>100:1			1000.00	1037.40	100	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.706	1/0	960476	20	>100:1			1000.00	987.19		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	1	979583	16	>100:1			1000.00	1033.57	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	1/0	994389	16	>100:1			1000.00	1017.43		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	1	316591	15	>100:1			1000.00	1043.47	100	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	1/0	366378	15	>100:1	Target = 3.79		884.00	837.19		
298.9 > 99	44	2.118	2.118		103723	15	>100:1	3.53 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	0/-1	298796	17	>100:1	Target = 3.30		938.00	927.59		
349 > 99	44	2.466	2.466		90225	17	>100:1	3.31 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.397	1	251776	19	>100:1			5000.00	5497.99	100	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.397	1/0	69083	18	>100:1	Target = 1.48		934.00	780.65		
327 > 81	63	2.397	2.397		47403	20	>100:1	1.45 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.440	2.440	1	862788	17	>100:1			1000.00	1032.36	100	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.440	2.440	1/0	814543	18	>100:1	Target = 16.51		1000.00	974.77		
313 > 119	49	2.440	2.440		54592	16	>100:1	14.92 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	0	897310	19	>100:1			5000.00	5425.64	100	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	0/0	233637	19	>100:1	Target = 0.69		2000.00	1865.41		
285 > 185	66	2.553	2.553		348519	18	>100:1	0.67 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	907666	18	>100:1			1000.00	1005.49	100	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	837511	18	>100:1	Target = 3.47		1000.00	1006.75		
363 > 169	47	2.818	2.818		245867	18	>100:1	3.40 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	303002	19	>100:1			1000.00	1116.07	100	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	0/-1	284151	29	>100:1	Target = 3.30		910.00	843.53		M
399 > 99	45	2.836	2.836		89654	26	>100:1	3.16 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.862	1/0	1311656	18	>100:1	Target = 2.54		942.00	854.50		
377 > 85	45	2.862	2.862		513418	18	>100:1	2.55 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.208	1/0	260979	22	>100:1	Target = 3.54		952.00	877.68		
449 > 99	45	3.208	3.208		73973	22	>100:1	3.52 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.176	3.176	1	244810	21	>100:1			5000.00	5511.42	100	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.176	3.176	1/0	85637	21	>100:1	Target = 1.46		948.00	930.49		
427 > 81	64	3.170	3.176		61750	29	>100:1	1.38 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.202	0	921507	22	>100:1			1000.00	1027.26	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.202	0/0	910742	22	>100:1	Target = 2.72		1000.00	987.40		
413 > 169	53	3.202	3.202		355726	22	>100:1	2.56 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.572	3.572	1	232494	20	>100:1			1000.00	1020.94	100	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.572	3.572	0/-1	242736	42	>100:1	Target = 3.88	0.26	928.00	933.91		M
499 > 99	54	3.572	3.572		67332	38	>100:1	3.60 (1.94-5.83)	0.07				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.774	3.774	0/-1	605234	19	>100:1			932.00	906.95		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.908	1/0	183612	19		Target = 3.09		960.00	933.97		
549 > 99	54	3.908	3.908		57682	21	>100:1	3.18 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.200	4.200	0/-1	246635	16	>100:1	Target = 3.32		964.00	1070.35		
599 > 99	54	4.200	4.200		60080	17		4.10 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.365	0/-1	557058	15	>100:1			942.00	934.55		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.699	4.699	1/0	192691	18		Target = 3.35		968.00	946.47		
699 > 99	54	4.699	4.699		58478	18	>100:1	3.29 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.579	3.579	1	901596	21	>100:1			1000.00	1013.71	100	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.579	3.579	1/0	755018	21	>100:1	Target = 4.81		1000.00	987.22		
463 > 169	56	3.579	3.579		154680	21	>100:1	4.88 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.863	1	459073	19	>100:1			1000.00	1018.67	100	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.863	1/0	454040	19	>100:1	Target = 40.56		1000.00	970.64		
498>478	55	3.863	3.863		11137	16	92:1	40.76 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	0	168869	18	>100:1			5000.00	5180.58	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.908	0/0	52572	18	>100:1	Target = 1.50		958.00	963.24		
527 > 81	65	3.908	3.908		33085	23	>100:1	1.58 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.497	4.497	0/0	65041	16	>100:1	Target = 2.24		964.00	972.78		
627 > 80	65	4.505	4.497		28066	15	>100:1	2.31 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.915	3.915	1	831393	19	>100:1			1000.00	1096.45	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.915	3.915	0/-1	691205	18	>100:1	Target = 9.65		1000.00	913.54		
513 > 169	51	3.915	3.915		75214	17	>100:1	9.18 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.077	1	941259	17	>100:1			5000.00	4707.53	100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	0/-1	153631	34	>100:1	Target = 1.47		1000.00	1062.10		M
570 > 483	58	4.077	4.077		106435	30	>100:1	1.44 (0.73-2.21)	0.22				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.225	1	956597	17	>100:1			5000.00	5326.68	100	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.225	4.225	0/-1	189035	35	>100:1	Target = 1.78		1000.00	989.23		M
584 > 526	60	4.235	4.225		95305	30	>100:1	1.98 (0.89-2.67)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.225	1	803090	16	>100:1			1000.00	1074.59	100	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.217	4.217	0/-1	647317	18	>100:1	Target = 9.77		1000.00	913.17		
563 > 169	52	4.225	4.217		62865	17	>100:1	10.29 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	0	176335	16	>100:1			1000.00	1014.31	100	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.291	1/1	166651	15	>100:1			1000.00	1049.56		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.300	4.300	1	62206	16	>100:1			1000.00	999.13	100	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.300	4.300	0/-1	71127	13	>100:1	Target = 1.18		1000.00	1079.39		
512 > 219	57	4.310	4.300		58094	15	64:1	1.22 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	156993	17	>100:1			1000.00	990.92	100	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	129501	17	>100:1			1000.00	985.98		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	0	64110	16	>100:1			1000.00	1050.22	100	M
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	66521	17	>100:1	Target = 1.11		1000.00	999.50		
526 > 219	59	4.473	4.473		55978	18	>100:1	1.18 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.489	4.489	0	788291	17	>100:1			1000.00	1018.19	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.489	4.489	0/0	744560	18	>100:1	Target = 7.48		1000.00	981.56		
613 > 169	38	4.489	4.489		102040	17	>100:1	7.29 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.726	4.726	1/1	336465	20	>100:1	Target = 3.23		1000.00	1006.31		
663 > 169	38	4.726	4.726		105926	20	>100:1	3.17 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.941	4.941	0	844286	18	>100:1			1000.00	1021.35	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.941	4.941	0/0	679906	19	74:1	Target = 8.62		1000.00	1001.52		
713 > 169	42	4.941	4.941		75539	16	>100:1	9.00 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.322	5.322	0	524461	16	>100:1			1000.00	1027.77	100	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.331	5.331	1/1	801220	19	89:1	Target = 12.71		1000.00	992.82		
813 > 269	40	5.331	5.331		59830	17	>100:1	13.39 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.693	5.693	0/0	617601	22	78:1	Target = 113.87		1000.00	973.66		
913 > 319	40	5.686	5.693		5286	22	>100:1	116.83 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.915	3.915	1	762145	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.440	2.440	1	811375	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.196	3.196	0	957960	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.700	1	930655	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.572	3.572	0	240599	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721016.d
Injection Date: 27-Jun-2021 12:45:59 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 6 Auto Sampler: 37
Sample Info: ICAL 2000_SVLC-1550 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.700	0	919465	20	>100:1			1000.00	993.40	95.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.706	0/0	1871816	19	>100:1			2000.00	2009.09		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	0	986357	16	>100:1			1000.00	1040.72	100.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	0/0	1894164	16	>100:1			2000.00	1924.75		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	0	306417	16	>100:1			1000.00	1009.94	96.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	0/0	722326	15	>100:1	Target = 3.79		1768.00	1705.35		
298.9 > 99	44	2.118	2.118		188611	15	>100:1	3.82 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	0/0	588922	17	>100:1	Target = 3.30		1876.00	1888.98		
349 > 99	44	2.466	2.466		188707	19	>100:1	3.12 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.396	2.397	0	211685	19	>100:1			5000.00	4622.53	84.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.396	2.397	0/0	148186	18	>100:1	Target = 1.48		1868.00	1991.67		
327 > 81	63	2.396	2.397		87919	18	>100:1	1.68 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.440	2.440	0	849219	17	>100:1			1000.00	1016.12	98.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.440	2.440	0/0	1657399	18	>100:1	Target = 16.51		2000.00	2015.12		
313 > 119	49	2.440	2.440		92453	16	>100:1	17.92 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	0	861468	18	>100:1			5000.00	5208.92	96	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	0/0	443041	19	>100:1	Target = 0.69		4000.00	3684.50		
285 > 185	66	2.561	2.553		660510	19	>100:1	0.67 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	896230	18	>100:1			1000.00	992.82	98.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	1633399	18	>100:1	Target = 3.47		2000.00	1988.52		
363 > 169	47	2.818	2.818		497732	18	>100:1	3.28 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.836	0	278762	18	>100:1			1000.00	1026.78	92	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.836	6/6	538486	26	>100:1	Target = 3.30	0.17	1820.00	1737.54		
399 > 99	45	2.835	2.836		162588	25	>100:1	3.31 (1.65-4.95)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.853	2.862	0/0	2584199	18	>100:1	Target = 2.54		1884.00	1829.92		
377 > 85	45	2.862	2.862		1020941	18	>100:1	2.53 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.204	3.208	0/0	505982	21	>100:1	Target = 3.54		1904.00	1849.61		
449 > 99	45	3.204	3.208		139875	20	>100:1	3.61 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.173	3.176	0	225807	22	>100:1			5000.00	5083.60	92.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.173	3.176	0/0	160043	23	>100:1	Target = 1.46		1896.00	1956.61		
427 > 81	64	3.173	3.176		105803	21	>100:1	1.51 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.198	3.202	0	894423	23	>100:1			1000.00	997.07	97.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.198	3.202	0/0	1806447	21	>100:1	Target = 2.72		2000.00	2017.81		
413 > 169	53	3.198	3.202		623347	23	>100:1	2.89 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.575	3.572	1	233030	19	>100:1			1000.00	1023.29	100.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.575	3.572	1/0	473044	42	>100:1	Target = 3.88	0.25	1856.00	1833.38		M
499 > 99	54	3.567	3.572		123313	43		3.83 (1.94-5.83)	0.25				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.777	3.774	1/0	1236777	19	>100:1			1864.00	1849.06		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.903	3.908	0/-1	382030	19	>100:1	Target = 3.09		1920.00	1938.79		
549 > 99	54	3.903	3.908		117066	17	>100:1	3.26 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.202	4.200	1/0	414936	18	>100:1	Target = 3.32		1928.00	1796.60		
599 > 99	54	4.202	4.200		132721	18		3.12 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.358	4.365	0/-1	1049525	15	>100:1			1884.00	1756.70		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.701	4.699	1/0	380352	17	>100:1	Target = 3.35		1936.00	1863.94		
699 > 99	54	4.701	4.699		113845	18		3.34 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.575	3.579	0	905123	20	>100:1			1000.00	1017.68	100.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.575	3.579	0/0	1538429	20	>100:1	Target = 4.81		2000.00	2003.73		
463 > 169	56	3.575	3.579		308442	19	>100:1	4.98 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.866	3.863	1	440596	20	>100:1			1000.00	977.67	96	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.858	3.863	0/-1	923415	21	>100:1	Target = 40.56		2000.00	2056.84		
498>478	55	3.866	3.863		21372	17	>100:1	43.20 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.911	3.908	1	159182	26	>100:1			5000.00	4883.40	94.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.911	3.908	1/0	101993	20	>100:1	Target = 1.50		1916.00	1982.48		
527 > 81	65	3.911	3.908		72916	25	>100:1	1.39 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.498	4.497	1/0	113617	18	>100:1	Target = 2.24		1928.00	1802.72		
627 > 80	65	4.498	4.497		50116	18	>100:1	2.26 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.911	3.915	0	725064	19	>100:1			1000.00	956.22	87.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.918	3.915	1/1	1560233	18	>100:1	Target = 9.65		2000.00	2364.50		
513 > 169	51	3.918	3.915		132645	18	>100:1	11.76 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.070	4.077	0	950971	17	>100:1			5000.00	4756.10	101	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.070	4.077	0/0	294655	32	>100:1	Target = 1.47	0.09	2000.00	2016.24		M
570 > 483	58	4.079	4.077		206291	32	>100:1	1.42 (0.73-2.21)	0.09				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.227	4.225	1	875614	16	>100:1			5000.00	4875.73	91.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.227	4.225	1/0	351571	37	>100:1	Target = 1.78		2000.00	2009.94		M
584 > 526	60	4.227	4.225		186669	32	>100:1	1.88 (0.89-2.67)	0.22				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.219	4.225	0	742765	17	>100:1			1000.00	993.87	92.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.219	4.217	1/1	1300164	17	>100:1	Target = 9.77		2000.00	1983.10		
563 > 169	52	4.219	4.217		137216	17	>100:1	9.47 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.284	4.282	1	175990	20	>100:1			1000.00	1012.32	99.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.293	4.291	1/0	314863	14	>100:1			2000.00	1986.88		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.302	4.300	1	62149	23	>100:1			1000.00	998.22	99.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.300	1/0	126444	14	>100:1	Target = 1.18		2000.00	1920.62		
512 > 219	57	4.302	4.300		105279	15	>100:1	1.20 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.444	4.443	1	156864	17	>100:1			1000.00	990.11	99.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	250922	19	>100:1			2000.00	1912.00		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.466	4.464	1	61678	15	>100:1			1000.00	1010.38	96.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.474	4.473	1/0	116456	18	>100:1	Target = 1.11		2000.00	1818.78		
526 > 219	59	4.466	4.473		116242	17	>100:1	1.00 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.482	4.489	0	787965	18	>100:1			1000.00	1017.77	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.490	4.489	1/1	1520039	18	>100:1	Target = 7.48		2000.00	2004.70		
613 > 169	38	4.490	4.489		202372	18	>100:1	7.51 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.721	4.726	0/0	621009	18	>100:1	Target = 3.23		2000.00	1858.09		
663 > 169	38	4.721	4.726		193229	18	>100:1	3.21 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.942	4.941	1	810905	16	>100:1			1000.00	980.97	96	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.942	4.941	1/0	1286834	18	>100:1	Target = 8.62		2000.00	1973.58		
713 > 169	42	4.942	4.941		149978	16	>100:1	8.58 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.325	5.322	1	509907	17	>100:1			1000.00	999.25	97.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.325	5.331	0/-1	1527161	17	>100:1	Target = 12.71		2000.00	1946.37		
813 > 269	40	5.325	5.331		118227	17	>100:1	12.91 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.689	5.693	0/-1	1223290	23	>100:1	Target = 113.87		2000.00	1983.58		
913 > 319	40	5.697	5.693		10629	23	>100:1	115.08 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.918	3.915	1	727601	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.440	2.440	0	796967	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.198	3.196	1	917002	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.699	1.700	0	886888	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.567	3.572	0	236066	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721017.d
Injection Date: 27-Jun-2021 12:56:35 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 7 Auto Sampler: 38
Sample Info: ICAL 5000_SVLC-1551 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.700	1	927772	19	>100:1			1000.00	1002.37	96.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.700	1.706	0/-1	4522666	20	>100:1			5000.00	4810.88		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.066	0	908258	16	>100:1			1000.00	958.32	92.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	1/1	4640134	16	>100:1			5000.00	5120.50		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.119	2.118	1	290095	15	>100:1			1000.00	956.14	91.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.119	2.118	1/0	1851244	15	>100:1	Target = 3.79		4420.00	4616.54		
298.9 > 99	44	2.119	2.118		482511	16	>100:1	3.83 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.467	2.466	1/0	1466399	17	>100:1	Target = 3.30		4690.00	4968.14		
349 > 99	44	2.467	2.466		437727	18	>100:1	3.35 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.397	1	236777	17	>100:1			5000.00	5170.46	94	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.397	1/0	386036	18	>100:1	Target = 1.48		4670.00	4638.62		
327 > 81	63	2.397	2.397		235267	18	>100:1	1.64 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.440	0	839149	17	>100:1			1000.00	1004.07	97.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.432	2.440	0/0	3853821	18	>100:1	Target = 16.51		5000.00	4741.83		
313 > 119	49	2.432	2.440		251390	18	>100:1	15.33 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	1	792780	19	>100:1			5000.00	4793.59	88.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	1/0	1065866	19	>100:1	Target = 0.69		10000	9632.17		
285 > 185	66	2.553	2.553		1556000	19	>100:1	0.68 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	956122	17	>100:1			1000.00	1059.17	105.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	4209270	18	>100:1	Target = 3.47		5000.00	4803.41		
363 > 169	47	2.818	2.818		1221711	18	>100:1	3.44 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	268276	18	>100:1			1000.00	988.16	88.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/1	1363425	29	>100:1	Target = 3.30		4550.00	4571.35		M
399 > 99	45	2.836	2.836		389762	29	>100:1	3.49 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.854	2.862	0/0	6444309	18	>100:1	Target = 2.54		4710.00	4741.69		
377 > 85	45	2.854	2.862		2544292	19	>100:1	2.53 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.209	3.208	1/1	1225737	22	>100:1	Target = 3.54		4760.00	4655.79		
449 > 99	45	3.202	3.208		347273	23	>100:1	3.52 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.170	3.176	0	212034	22	>100:1			5000.00	4773.53	86.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.177	3.176	1/1	380463	21	>100:1	Target = 1.46		4740.00	5059.95		
427 > 81	64	3.170	3.176		235319	22	>100:1	1.61 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.196	3.202	0	890381	23	>100:1			1000.00	992.56	96.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.202	1/1	4493290	22	>100:1	Target = 2.72		5000.00	5041.80		
413 > 169	53	3.202	3.202		1611455	22	>100:1	2.78 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.572	3.572	1	229436	22	>100:1			1000.00	1007.51	98.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.572	3.572	1/0	1142705	42	>100:1	Target = 3.88	0.27	4640.00	4525.18		M
499 > 99	54	3.572	3.572		280601	34	>100:1	4.07 (1.94-5.83)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.774	3.774	1/0	2959735	20	>100:1			4660.00	4494.31		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.900	3.908	0/-1	937878	18	>100:1	Target = 3.09		4800.00	4834.25		
549 > 99	54	3.900	3.908		288552	18	>100:1	3.25 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.200	4.200	1/0	1064700	17	>100:1	Target = 3.32		4820.00	4682.18		
599 > 99	54	4.192	4.200		379051	17		2.80 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.356	4.365	0/-1	2732551	15	>100:1			4710.00	4645.39		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.692	4.699	0/-1	928684	17	>100:1	Target = 3.35		4840.00	4622.36		
699 > 99	54	4.692	4.699		276592	18	>100:1	3.35 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.572	3.579	0	876949	20	>100:1			1000.00	986.00	97.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.572	3.579	0/0	3676416	20	>100:1	Target = 4.81		5000.00	4942.19		
463 > 169	56	3.572	3.579		773776	19	>100:1	4.75 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.863	0	444701	19	>100:1			1000.00	986.78	96.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.863	1/1	2241681	18	>100:1	Target = 40.56		5000.00	4947.09		
498>478	55	3.855	3.863		54720	16	>100:1	40.96 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	1	153232	19	>100:1			5000.00	4700.86	90.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.908	1/0	232926	20	>100:1	Target = 1.50		4790.00	4703.27		
527 > 81	65	3.908	3.908		164195	20	>100:1	1.41 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.497	4.497	1/0	276643	17	>100:1	Target = 2.24		4820.00	4559.82		
627 > 80	65	4.497	4.497		126533	17	>100:1	2.18 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.915	1	718673	19	>100:1			1000.00	947.79	86.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.916	3.915	1/0	3213277	18	>100:1	Target = 9.65		5000.00	4912.95		
513 > 169	51	3.916	3.915		339585	20	>100:1	9.46 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.077	0	986247	17	>100:1			5000.00	4932.53	104.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.069	4.077	0/0	726817	33	>100:1	Target = 1.47	0.09	5000.00	4795.52		M
570 > 483	58	4.069	4.077		505288	32	>100:1	1.43 (0.73-2.21)	0.18				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.217	4.225	0	854946	17	>100:1			5000.00	4760.65	89.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.226	4.225	1/1	828926	36	>100:1	Target = 1.78		5000.00	4853.55		M
584 > 526	60	4.226	4.225		467773	32	>100:1	1.77 (0.89-2.67)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.217	4.225	0	708337	17	>100:1			1000.00	947.81	88.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.217	4.217	1/1	3205447	17	>100:1	Target = 9.77		5000.00	5126.81		
563 > 169	52	4.217	4.217		300592	16	>100:1	10.66 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	1	164183	14	>100:1			1000.00	944.41	93.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.291	1/0	799010	15	>100:1			5000.00	5404.59		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.300	1	63509	15	>100:1			1000.00	1020.06	102.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.300	1/0	338765	15	>100:1	Target = 1.18		5000.00	5035.48		
512 > 219	57	4.301	4.300		284980	18	90:1	1.18 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	151643	16	>100:1			1000.00	957.15	96.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	639921	17	>100:1			5000.00	5044.03		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	59092	15	>100:1			1000.00	968.02	92.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	311286	15	>100:1	Target = 1.11		5000.00	5074.35		
526 > 219	59	4.473	4.473		283722	17	>100:1	1.09 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.489	4.489	1	729246	18	>100:1			1000.00	941.92	92.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.489	4.489	1/0	3469639	17	>100:1	Target = 7.48		5000.00	4944.38		
613 > 169	38	4.489	4.489		477992	19	>100:1	7.25 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.720	4.726	0/-1	1630581	19	>100:1	Target = 3.23		5000.00	5271.63		
663 > 169	38	4.720	4.726		486768	18	>100:1	3.34 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.941	4.941	1	799172	16	>100:1			1000.00	966.78	94.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.941	4.941	1/0	3279338	18	>100:1	Target = 8.62		5000.00	5103.26		
713 > 169	42	4.941	4.941		369974	18	>100:1	8.86 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.322	5.322	1	506199	18	>100:1			1000.00	991.98	96.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.322	5.331	0/-1	3763326	17	>100:1	Target = 12.71		5000.00	4831.51		
813 > 269	40	5.322	5.331		293035	17	>100:1	12.84 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.686	5.693	0/-1	3117260	23	>100:1	Target = 113.87		5000.00	5091.71		
913 > 319	40	5.686	5.693		26926	23	>100:1	115.77 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.916	3.915	1	763445	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.432	2.440	0	799866	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.196	3.196	1	922494	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.700	1	863037	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.572	3.572	1	236697	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721018.d
Injection Date: 27-Jun-2021 13:07:10 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 8 Auto Sampler: 39
Sample Info: ICAL 10000_SVLC-1552 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.700	0	883716	19	>100:1			1000.00	954.78	92	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.700	1.706	0/0	8983846	20	>100:1			10000	10033		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	0	946461	17	>100:1			1000.00	998.62	96.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	0/0	9319979	16	>100:1			10000	9869.69		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	0	295634	16	>100:1			1000.00	974.40	93.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	0/0	3632092	15	>100:1	Target = 3.79		8840.00	8887.83		
298.9 > 99	44	2.118	2.118		954714	15	>100:1	3.80 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	0/0	2848837	18	>100:1	Target = 3.30		9380.00	9470.98		
349 > 99	44	2.466	2.466		872727	18	>100:1	3.26 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.397	0	213405	19	>100:1			5000.00	4660.09	84.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.397	0/0	656864	19	>100:1	Target = 1.48		9340.00	8757.32		
327 > 81	63	2.388	2.397		450113	18	>100:1	1.45 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.431	2.440	0	831518	17	>100:1			1000.00	994.94	96.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.431	2.440	0/0	7580371	18	>100:1	Target = 16.51		10000	9412.66		
313 > 119	49	2.431	2.440		468633	17	>100:1	16.17 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	0	828631	18	>100:1			5000.00	5010.36	92.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	0/0	2439627	19	>100:1	Target = 0.69		20000	21093		
285 > 185	66	2.553	2.553		3192774	19	>100:1	0.76 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	850678	18	>100:1			1000.00	942.36	93.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	7898758	19	>100:1	Target = 3.47		10000	10131		
363 > 169	47	2.818	2.818		2272707	18	>100:1	3.47 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	257079	20	>100:1			1000.00	946.92	84.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	0/0	2634887	35	>100:1	Target = 3.30		9100.00	9219.14		M
399 > 99	45	2.836	2.836		785134	28	>100:1	3.35 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.853	2.862	0/0	11994256	18	>100:1	Target = 2.54		9420.00	9209.70		
377 > 85	45	2.853	2.862		4562523	17	>100:1	2.62 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.202	3.208	0/0	2455354	22	>100:1	Target = 3.54		9520.00	9732.53		
449 > 99	45	3.202	3.208		708024	22	>100:1	3.46 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.170	3.176	0	209510	23	>100:1			5000.00	4716.71	85.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.170	3.176	0/0	706158	22	>100:1	Target = 1.46		9480.00	9565.70		
427 > 81	64	3.170	3.176		466930	23	>100:1	1.51 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.195	3.202	0	845781	22	>100:1			1000.00	942.84	91.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.195	3.202	0/0	7803382	23	>100:1	Target = 2.72		10000	9217.69		
413 > 169	53	3.195	3.202		2969482	23	>100:1	2.62 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.564	3.572	0	228009	21	>100:1			1000.00	1001.25	98.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.572	3.572	0/0	2314366	45	>100:1	Target = 3.88	0.28	9280.00	9241.68		M
499 > 99	54	3.564	3.572		591925	40	>100:1	3.90 (1.94-5.83)	0.11				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.774	3.774	0/0	5781691	20	>100:1			9320.00	8834.34		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.900	3.908	0/0	1885611	18	>100:1	Target = 3.09		9600.00	9780.12		
549 > 99	54	3.900	3.908		572709	18	>100:1	3.29 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.200	4.200	0/0	2077806	17	>100:1	Target = 3.32		9640.00	9194.65		
599 > 99	54	4.200	4.200		613728	16	>100:1	3.38 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.356	4.365	0/0	5451173	16	>100:1			9420.00	9325.10		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.699	4.699	0/0	1855547	19	>100:1	Target = 3.35		9680.00	9293.45		
699 > 99	54	4.699	4.699		563780	18	>100:1	3.29 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.572	3.579	0	846536	20	>100:1			1000.00	951.81	93.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.572	3.579	0/0	7249338	19	>100:1	Target = 4.81		10000	10095		
463 > 169	56	3.572	3.579		1495092	20	>100:1	4.84 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.863	0	443395	18	>100:1			1000.00	983.89	96.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.862	3.863	0/0	4337091	19	>100:1	Target = 40.56		10000	9599.57		
498>478	55	3.855	3.863		110133	18	>100:1	39.38 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.900	3.908	0	155941	20				5000.00	4783.97	92.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.908	0/0	407525	19	>100:1	Target = 1.50		9580.00	8085.85		
527 > 81	65	3.908	3.908		306934	20	>100:1	1.32 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.497	4.497	0/0	546320	17	>100:1	Target = 2.24		9640.00	8848.40		
627 > 80	65	4.497	4.497		248048	16	>100:1	2.20 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.915	3.915	0	709032	17	>100:1			1000.00	935.08	85.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.915	3.915	0/0	6189240	19	>100:1	Target = 9.65		10000	9591.73		
513 > 169	51	3.915	3.915		635777	18	>100:1	9.73 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.068	4.077	0	1006890	17	>100:1			5000.00	5035.77	107	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.068	4.077	0/0	1292586	37	>100:1	Target = 1.47	0.09	10000	8353.59		M
570 > 483	58	4.068	4.077		1032387	32	>100:1	1.25 (0.73-2.21)	0.11				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.225	0	866790	17	>100:1			5000.00	4826.60	90.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.225	4.225	0/0	1700119	35	>100:1	Target = 1.78		10000	9818.56		M
584 > 526	60	4.225	4.225		934536	32	>100:1	1.81 (0.89-2.67)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.217	4.225	0	685408	16	>100:1			1000.00	917.13	85.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.217	1/1	6053068	17	>100:1	Target = 9.77		10000	10005		
563 > 169	52	4.217	4.217		590504	18	>100:1	10.25 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	0	158504	15	>100:1			1000.00	911.74	89.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.291	0/0	1551170	15	>100:1			10000	10868		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.300	4.300	0	58879	14	>100:1			1000.00	945.70	94.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.300	4.300	0/0	608372	16	>100:1	Target = 1.18		10000	9754.09		
512 > 219	57	4.300	4.300		570266	15	>100:1	1.06 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	151181	16	>100:1			1000.00	954.24	96.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	1222987	17	>100:1			10000	9669.37		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	1	60600	17	>100:1			1000.00	992.72	94.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	0/-1	607680	16	>100:1	Target = 1.11		10000	9659.44		
526 > 219	59	4.473	4.473		580095	16	>100:1	1.04 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.489	4.489	0	711401	17	>100:1			1000.00	918.88	90.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.489	4.489	0/0	6798916	17	>100:1	Target = 7.48		10000	9931.78		
613 > 169	38	4.489	4.489		904015	17	>100:1	7.52 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.726	4.726	0/0	3046868	19	>100:1	Target = 3.23		10000	10098		
663 > 169	38	4.726	4.726		955060	19	>100:1	3.19 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.941	4.941	0	825280	17	>100:1			1000.00	998.36	97.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.941	4.941	0/0	6391998	18	>100:1	Target = 8.62		10000	9632.46		
713 > 169	42	4.941	4.941		730946	18	>100:1	8.74 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.322	5.322	0	492468	17	>100:1			1000.00	965.07	93.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.322	5.331	0/0	7257436	17	>100:1	Target = 12.71		10000	9577.18		
813 > 269	40	5.322	5.331		561913	17	>100:1	12.91 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.686	5.693	0/0	5934258	23	>100:1	Target = 113.87		10000	9963.24		
913 > 319	40	5.686	5.693		49817	23	>100:1	119.12 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.908	3.915	0	600148	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.440	2.440	0	772737	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.195	3.196	0	837147	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.700	0	847691	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.564	3.572	0	238819	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721018.d
Injection Date: 27-Jun-2021 13:07:10 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 8 Auto Sampler: 39
Sample Info: ICAL 10000_SVLC-1552 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.700	0	883716	19	>100:1			1000.00	954.78	92	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.700	1.706	0/0	8983846	20	>100:1			10000	10033		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	0	946461	17	>100:1			1000.00	998.62	96.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	0/0	9319979	16	>100:1			10000	9869.69		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	0	295634	16	>100:1			1000.00	974.40	93.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	0/0	3632092	15	>100:1	Target = 3.79		8840.00	8887.83		
298.9 > 99	44	2.118	2.118		954714	15	>100:1	3.80 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	0/0	2848837	18	>100:1	Target = 3.30		9380.00	9470.98		
349 > 99	44	2.466	2.466		872727	18	>100:1	3.26 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.397	0	213405	19	>100:1			5000.00	4660.09	84.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.397	0/0	656864	19	>100:1	Target = 1.48		9340.00	8757.32		
327 > 81	63	2.388	2.397		450113	18	>100:1	1.45 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.431	2.440	0	831518	17	>100:1			1000.00	994.94	96.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.431	2.440	0/0	7580371	18	>100:1	Target = 16.51		10000	9412.66		
313 > 119	49	2.431	2.440		468633	17	>100:1	16.17 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	0	828631	18	>100:1			5000.00	5010.36	92.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	0/0	2439627	19	>100:1	Target = 0.69		20000	21093		
285 > 185	66	2.553	2.553		3192774	19	>100:1	0.76 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	850678	18	>100:1			1000.00	942.36	93.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	7898758	19	>100:1	Target = 3.47		10000	10131		
363 > 169	47	2.818	2.818		2272707	18	>100:1	3.47 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	257079	20	>100:1			1000.00	946.92	84.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	0/0	2634887	35	>100:1	Target = 3.30		9100.00	9219.14		M
399 > 99	45	2.836	2.836		785134	28	>100:1	3.35 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.853	2.862	0/0	11994256	18	>100:1	Target = 2.54		9420.00	9209.70		
377 > 85	45	2.853	2.862		4562523	17	>100:1	2.62 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.202	3.208	0/0	2455354	22	>100:1	Target = 3.54		9520.00	9732.53		
449 > 99	45	3.202	3.208		708024	22	>100:1	3.46 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.170	3.176	0	209510	23	>100:1			5000.00	4716.71	85.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.170	3.176	0/0	706158	22	>100:1	Target = 1.46		9480.00	9565.70		
427 > 81	64	3.170	3.176		466930	23	>100:1	1.51 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.195	3.202	0	845781	22	>100:1			1000.00	942.84	91.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.195	3.202	0/0	7803382	23	>100:1	Target = 2.72		10000	9217.69		
413 > 169	53	3.195	3.202		2969482	23	>100:1	2.62 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.564	3.572	0	228009	21	>100:1			1000.00	1001.25	98.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.572	3.572	0/0	2314366	45	>100:1	Target = 3.88	0.28	9280.00	9241.68		M
499 > 99	54	3.564	3.572		591925	40	>100:1	3.90 (1.94-5.83)	0.11				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.774	3.774	0/0	5781691	20	>100:1			9320.00	8834.34		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.900	3.908	0/0	1885611	18	>100:1	Target = 3.09		9600.00	9780.12		
549 > 99	54	3.900	3.908		572709	18	>100:1	3.29 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.200	4.200	0/0	2077806	17	>100:1	Target = 3.32		9640.00	9194.65		
599 > 99	54	4.200	4.200		613728	16	>100:1	3.38 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.356	4.365	0/0	5451173	16	>100:1			9420.00	9325.10		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.699	4.699	0/0	1855547	19	>100:1	Target = 3.35		9680.00	9293.45		
699 > 99	54	4.699	4.699		563780	18	>100:1	3.29 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.572	3.579	0	846536	20	>100:1			1000.00	951.81	93.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.572	3.579	0/0	7249338	19	>100:1	Target = 4.81		10000	10095		
463 > 169	56	3.572	3.579		1495092	20	>100:1	4.84 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.863	0	443395	18	>100:1			1000.00	983.89	96.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.862	3.863	0/0	4337091	19	>100:1	Target = 40.56		10000	9599.57		
498>478	55	3.855	3.863		110133	18	>100:1	39.38 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.900	3.908	0	155941	20				5000.00	4783.97	92.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.908	0/0	407525	19	>100:1	Target = 1.50		9580.00	8085.85		
527 > 81	65	3.908	3.908		306934	20	>100:1	1.32 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.497	4.497	0/0	546320	17	>100:1	Target = 2.24		9640.00	8848.40		
627 > 80	65	4.497	4.497		248048	16	>100:1	2.20 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.915	3.915	0	709032	17	>100:1			1000.00	935.08	85.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.915	3.915	0/0	6189240	19	>100:1	Target = 9.65		10000	9591.73		
513 > 169	51	3.915	3.915		635777	18	>100:1	9.73 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.068	4.077	0	1006890	17	>100:1			5000.00	5035.77	107	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.068	4.077	0/0	1292586	37	>100:1	Target = 1.47	0.09	10000	8353.59		M
570 > 483	58	4.068	4.077		1032387	32	>100:1	1.25 (0.73-2.21)	0.11				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.225	0	866790	17	>100:1			5000.00	4826.60	90.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.225	4.225	0/0	1700119	35	>100:1	Target = 1.78		10000	9818.56		M
584 > 526	60	4.225	4.225		934536	32	>100:1	1.81 (0.89-2.67)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.217	4.225	0	685408	16	>100:1			1000.00	917.13	85.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.217	1/1	6053068	17	>100:1	Target = 9.77		10000	10005		
563 > 169	52	4.217	4.217		590504	18	>100:1	10.25 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	0	158504	15	>100:1			1000.00	911.74	89.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.291	0/0	1551170	15	>100:1			10000	10868		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.300	4.300	0	58879	14	>100:1			1000.00	945.70	94.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.300	4.300	0/0	608372	16	>100:1	Target = 1.18		10000	9754.09		
512 > 219	57	4.300	4.300		570266	15	>100:1	1.06 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	151181	16	>100:1			1000.00	954.24	96.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	1222987	17	>100:1			10000	9669.37		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	1	60600	17	>100:1			1000.00	992.72	94.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	0/-1	607680	16	>100:1	Target = 1.11		10000	9659.44		
526 > 219	59	4.473	4.473		580095	16	>100:1	1.04 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.489	4.489	0	711401	17	>100:1			1000.00	918.88	90.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.489	4.489	0/0	6798916	17	>100:1	Target = 7.48		10000	9931.78		
613 > 169	38	4.489	4.489		904015	17	>100:1	7.52 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.726	4.726	0/0	3046868	19	>100:1	Target = 3.23		10000	10098		
663 > 169	38	4.726	4.726		955060	19	>100:1	3.19 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.941	4.941	0	825280	17	>100:1			1000.00	998.36	97.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.941	4.941	0/0	6391998	18	>100:1	Target = 8.62		10000	9632.46		
713 > 169	42	4.941	4.941		730946	18	>100:1	8.74 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.322	5.322	0	492468	17	>100:1			1000.00	965.07	93.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.322	5.331	0/0	7257436	17	>100:1	Target = 12.71		10000	9577.18		
813 > 269	40	5.322	5.331		561913	17	>100:1	12.91 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.686	5.693	0/0	5934258	23	>100:1	Target = 113.87		10000	9963.24		
913 > 319	40	5.686	5.693		49817	23	>100:1	119.12 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.908	3.915	0	600148	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.440	2.440	0	772737	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.195	3.196	0	837147	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.700	0	847691	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.564	3.572	0	238819	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721019.d
Injection Date: 27-Jun-2021 13:17:46 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 9 Auto Sampler: 40
Sample Info: ICAL 15000_SVLC-1553 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.700	1	841413	20	>100:1			1000.00	909.07	87.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.700	1.706	0/-1	12875909	20	>100:1			15000	15102		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	1	855833	17	>100:1			1000.00	903.00	87.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	1/0	13011470	16	>100:1			15000	15238		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	1	294017	16	>100:1			1000.00	969.07	92.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	1/0	5258268	15	>100:1	Target = 3.79		13260	12938		
298.9 > 99	44	2.118	2.118		1465791	15	>100:1	3.58 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	1/0	3891031	18	>100:1	Target = 3.30		14070	13007		
349 > 99	44	2.466	2.466		1186735	18	>100:1	3.27 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.397	0	231250	17	>100:1			5000.00	5049.77	91.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.397	1/1	1027490	17	>100:1	Target = 1.48		14010	12641		
327 > 81	63	2.397	2.397		599504	17	>100:1	1.71 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.440	0	745630	18	>100:1			1000.00	892.17	86.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.432	2.440	0/0	11632447	18	>100:1	Target = 16.51		15000	16108		
313 > 119	49	2.432	2.440		659697	18	>100:1	17.63 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	1	744782	18	>100:1			5000.00	4503.37	83	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	1/0	3204701	18	>100:1	Target = 0.69		30000	30827		
285 > 185	66	2.553	2.553		4609345	18	>100:1	0.69 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.818	0	892269	17	>100:1			1000.00	988.43	98.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/1	11737432	19	>100:1	Target = 3.47		15000	14353		
363 > 169	47	2.809	2.818		3320345	19	>100:1	3.53 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	239591	18	>100:1			1000.00	882.50	79.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.836	0/0	3643544	36	>100:1	Target = 3.30		13650	13679		M
399 > 99	45	2.827	2.836		1087275	28	>100:1	3.35 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.853	2.862	0/0	17492139	19	>100:1	Target = 2.54		14130	14412		
377 > 85	45	2.853	2.862		7068476	18	>100:1	2.47 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.202	3.208	0/0	3400019	22	>100:1	Target = 3.54		14280	14461		
449 > 99	45	3.202	3.208		973360	22	>100:1	3.49 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.164	3.176	0	208609	22	>100:1			5000.00	4696.42	85.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.170	3.176	0/0	1000987	23	>100:1	Target = 1.46		14220	13647		
427 > 81	64	3.170	3.176		631872	21	>100:1	1.58 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.196	3.202	0	799285	23	>100:1			1000.00	891.01	86.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.202	1/1	11632371	23	>100:1	Target = 2.72		15000	14540		
413 > 169	53	3.202	3.202		4331075	23	>100:1	2.68 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.563	3.572	0	210250	21	>100:1			1000.00	923.26	90.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.571	3.572	0/0	3269272	46	>100:1	Target = 3.88	0.29	13920	14167		M
499 > 99	54	3.571	3.572		807413	40	>100:1	4.04 (1.94-5.83)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.768	3.774	0/0	8585370	20	>100:1			13980	14226		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.900	3.908	0/0	2593157	18	>100:1	Target = 3.09		14400	14586		
549 > 99	54	3.900	3.908		780432	18	>100:1	3.32 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.200	4.200	1/1	2863783	17	>100:1	Target = 3.32		14460	13743		
599 > 99	54	4.200	4.200		879454	17	>100:1	3.25 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.356	4.365	0/0	7511483	16	>100:1			14130	13935		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.692	4.699	0/0	2708609	18	>100:1	Target = 3.35		14520	14712		
699 > 99	54	4.692	4.699		809285	18	>100:1	3.34 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.571	3.579	0	818044	20	>100:1			1000.00	919.77	90.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.571	3.579	0/0	10282202	19	>100:1	Target = 4.81		15000	14818		
463 > 169	56	3.571	3.579		2102991	20	>100:1	4.88 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.863	1	429657	21	>100:1			1000.00	953.40	93.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.863	0/-1	6269740	19	>100:1	Target = 40.56		15000	14321		
498>478	55	3.855	3.863		152983	21	>100:1	40.98 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	1	136434	19	>100:1			5000.00	4185.53	80.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.908	1/0	585354	19	>100:1	Target = 1.50		14370	13275		
527 > 81	65	3.908	3.908		406678	20	>100:1	1.43 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.497	4.497	1/0	796599	17	>100:1	Target = 2.24		14460	14747		
627 > 80	65	4.497	4.497		355665	17	>100:1	2.23 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.915	3.915	1	660430	19	>100:1			1000.00	870.98	79.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.915	3.915	1/0	9004034	19	>100:1	Target = 9.65		15000	14981		
513 > 169	51	3.915	3.915		900939	19	>100:1	9.99 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.077	0	946705	16	>100:1			5000.00	4734.77	100.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.069	4.077	0/0	2148670	33	>100:1	Target = 1.47	0.09	15000	14769		M
570 > 483	58	4.069	4.077		1464651	32	>100:1	1.46 (0.73-2.21)	0.22				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.226	4.225	1	808437	18	>100:1			5000.00	4501.67	84.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.226	4.225	1/0	2342471	37	>100:1	Target = 1.78		15000	14505		M
584 > 526	60	4.226	4.225		1328817	33	>100:1	1.76 (0.89-2.67)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.217	4.225	0	661610	18	>100:1			1000.00	885.28	82.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.217	4.217	1/1	8397419	17	>100:1	Target = 9.77		15000	14379		
563 > 169	52	4.217	4.217		842704	16	>100:1	9.96 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	1	162273	14	>100:1			1000.00	933.42	92	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.291	1/0	2232005	15	>100:1			15000	15275		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.300	1	69093	16	>100:1			1000.00	1109.75	111.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.300	1/0	926907	15	86:1	Target = 1.18		15000	12664		
512 > 219	57	4.301	4.300		844499	14	>100:1	1.09 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	149418	16	>100:1			1000.00	943.11	95.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	1854942	17	>100:1			15000	14839		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	53062	16	>100:1			1000.00	869.24	82.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	903327	17	>100:1	Target = 1.11		15000	16399		
526 > 219	59	4.473	4.473		773910	16	>100:1	1.16 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.489	4.489	1	705502	18	>100:1			1000.00	911.26	89.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.489	4.489	1/0	9357373	18	>100:1	Target = 7.48		15000	13783		
613 > 169	38	4.489	4.489		1298519	18	>100:1	7.20 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.720	4.726	0/-1	4469962	19	>100:1	Target = 3.23		15000	14938		
663 > 169	38	4.720	4.726		1348075	19	>100:1	3.31 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.941	4.941	1	768768	17	>100:1			1000.00	930.00	91.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.941	4.941	1/0	8833442	18	>100:1	Target = 8.62		15000	14290		
713 > 169	42	4.941	4.941		997377	18	>100:1	8.85 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.322	5.322	1	456805	18	>100:1			1000.00	895.18	87.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.322	5.331	0/-1	10156743	17	>100:1	Target = 12.71		15000	14450		
813 > 269	40	5.322	5.331		799978	17	>100:1	12.69 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.686	5.693	0/-1	8759086	23	>100:1	Target = 113.87		15000	15854		
913 > 319	40	5.686	5.693		71617	23	>100:1	122.30 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.915	3.915	1	716291	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.432	2.440	0	752472	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.196	3.196	1	802315	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.700	1	818295	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.571	3.572	0	209033	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721020.d
Injection Date: 27-Jun-2021 13:28:25 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 10 Auto Sampler: 41
Sample Info: ICAL 20000_SVLC-1554 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.700	1	850280	20	>100:1			1000.00	918.65	88.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.700	1.706	0/-1	16884140	20	>100:1			20000	19597		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.066	0	903539	16	>100:1			1000.00	953.34	92.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.066	0/0	16985936	16	>100:1			20000	18842		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	1	287832	15	>100:1			1000.00	948.68	90.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	1/0	6971633	16	>100:1	Target = 3.79		17680	17522		
298.9 > 99	44	2.118	2.118		1918971	16	>100:1	3.63 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	1/0	5492698	18	>100:1	Target = 3.30		18760	18755		
349 > 99	44	2.466	2.466		1666552	18	>100:1	3.29 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.397	0	208666	17	>100:1			5000.00	4556.60	82.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.397	0/0	1465051	18	>100:1	Target = 1.48		18680	19976		
327 > 81	63	2.397	2.397		905890	17	>100:1	1.61 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.440	0	766202	18	>100:1			1000.00	916.79	88.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.432	2.440	0/0	14912044	18	>100:1	Target = 16.51		20000	20095		
313 > 119	49	2.423	2.440		833596	18	>100:1	17.88 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	1	752443	18	>100:1			5000.00	4549.69	83.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	1/0	4277406	18	>100:1	Target = 0.69		40000	40727		
285 > 185	66	2.553	2.553		5990823	18	>100:1	0.71 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.818	0	797100	19	>100:1			1000.00	883.01	87.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.818	0/0	14533958	19	>100:1	Target = 3.47		20000	19894		
363 > 169	47	2.809	2.818		4569494	18	>100:1	3.18 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	245539	17	>100:1			1000.00	904.41	81	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.836	0/0	5181090	36	>100:1	Target = 3.30		18200	18980		M
399 > 99	45	2.827	2.836		1456126	29	>100:1	3.55 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.853	2.862	0/0	22157893	18	>100:1	Target = 2.54		18840	17813		
377 > 85	45	2.853	2.862		9372122	18	>100:1	2.36 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.202	3.208	0/0	4695634	22	>100:1	Target = 3.54		19040	19487		
449 > 99	45	3.202	3.208		1324679	22	>100:1	3.54 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.170	3.176	0	198402	22	>100:1			5000.00	4466.63	81	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.164	3.176	0/0	1299241	22	>100:1	Target = 1.46		18960	18651		
427 > 81	64	3.170	3.176		895470	22	>100:1	1.45 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.189	3.202	0	838476	22	>100:1			1000.00	934.70	91	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.196	3.202	0/0	15701027	23	>100:1	Target = 2.72		20000	18708		
413 > 169	53	3.196	3.202		5831191	22	>100:1	2.69 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.563	3.572	0	215152	20	>100:1			1000.00	944.79	92.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.563	3.572	0/0	4635094	46	>100:1	Target = 3.88	0.29	18560	19636		M
499 > 99	54	3.563	3.572		1161024	46	>100:1	3.99 (1.94-5.83)	0.12				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.768	3.774	0/0	11479562	20	>100:1			18640	18589		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.901	3.908	0/0	3604330	19	>100:1	Target = 3.09		19200	19812		
549 > 99	54	3.901	3.908		1022196	19	>100:1	3.52 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.200	4.200	1/1	3860340	17	>100:1	Target = 3.32		19280	18103		
599 > 99	54	4.200	4.200		1238270	17		3.11 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.357	4.365	0/0	10384399	16	>100:1			18840	18826		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.693	4.699	0/0	3734012	18	>100:1	Target = 3.35		19360	19819		
699 > 99	54	4.693	4.699		1096740	17	>100:1	3.40 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.570	3.579	0	804075	19	>100:1			1000.00	904.07	89.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.570	3.579	0/0	13663432	20	>100:1	Target = 4.81		20000	20032		
463 > 169	56	3.570	3.579		2973971	21	>100:1	4.59 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.863	0	419591	17	>100:1			1000.00	931.06	91.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.863	0/0	8799455	19	>100:1	Target = 40.56		20000	20581		
498>478	55	3.855	3.863		202540	17	>100:1	43.44 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.901	3.908	0	130236	18	>100:1			5000.00	3995.39	77.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.908	1/1	777312	20	>100:1	Target = 1.50		19160	18467		
527 > 81	65	3.901	3.908		546462	21	>100:1	1.42 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.498	4.497	1/1	1037279	18	>100:1	Target = 2.24		19280	20116		
627 > 80	65	4.498	4.497		473425	18	>100:1	2.19 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.908	3.915	0	648944	19	>100:1			1000.00	855.83	78.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.916	3.915	1/1	11442124	18	>100:1	Target = 9.65		20000	19374		
513 > 169	51	3.916	3.915		1176426	18	>100:1	9.72 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.077	0	1019892	17	>100:1			5000.00	5100.80	108.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.069	4.077	0/0	2978808	36	>100:1	Target = 1.47	0.09	20000	19006		M
570 > 483	58	4.069	4.077		1970812	30	>100:1	1.51 (0.73-2.21)	0.23				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.217	4.225	0	748961	17	>100:1			5000.00	4170.48	78.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.226	4.225	1/1	3096175	36	>100:1	Target = 1.78		20000	20694		M
584 > 526	60	4.226	4.225		1710815	33	>100:1	1.80 (0.89-2.67)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.217	4.225	0	653871	17	>100:1			1000.00	874.93	81.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.217	4.217	1/1	11785813	17	>100:1	Target = 9.77		20000	20421		
563 > 169	52	4.217	4.217		1105653	17	>100:1	10.65 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	1	181217	16	>100:1			1000.00	1042.39	102.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.291	1/0	3148272	15	>100:1			20000	19294		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.300	1	70822	19	>100:1			1000.00	1137.52	113.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.300	1/0	1283169	15	>100:1	Target = 1.18		20000	17104		
512 > 219	57	4.301	4.300		1140525	15	99:1	1.12 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	161193	17	>100:1			1000.00	1017.43	102.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	2669548	18	>100:1			20000	19795		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	57084	16	>100:1			1000.00	935.12	89	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	1211094	17	>100:1	Target = 1.11		20000	20437		
526 > 219	59	4.473	4.473		1096377	17	>100:1	1.10 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.481	4.489	0	683040	17	>100:1			1000.00	882.24	86.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.481	4.489	0/0	12534100	18	>100:1	Target = 7.48		20000	19070		
613 > 169	38	4.481	4.489		1760019	18	>100:1	7.12 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.721	4.726	0/0	6269893	19	>100:1	Target = 3.23		20000	21642		
663 > 169	38	4.721	4.726		1809134	21	>100:1	3.46 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.933	4.941	0	785663	16	>100:1			1000.00	950.44	93.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.933	4.941	0/0	11976855	19	>100:1	Target = 8.62		20000	18959		
713 > 169	42	4.933	4.941		1406990	19	>100:1	8.51 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.314	5.322	0	480834	18	>100:1			1000.00	942.27	91.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.322	5.331	0/0	13512893	18	>100:1	Target = 12.71		20000	18264		
813 > 269	40	5.322	5.331		1084604	17	>100:1	12.45 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.679	5.693	0/0	11858520	22	>100:1	Target = 113.87		20000	20391		
913 > 319	40	5.679	5.693		98270	23	>100:1	120.67 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.916	3.915	1	648479	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.432	2.440	0	746880	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.196	3.196	1	834568	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.700	1	821980	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.563	3.572	0	219958	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721021.d
Injection Date: 27-Jun-2021 13:38:58 Injection Vol: 10.0 uL
Sample Type: InstBlk Auto Sampler: 100
Lab Sample ID: ID IBLK C Lab Prep. Batch:
Sample Info: ID IBLK C Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.700	0	1053774	19	>100:1			1001.00	1138.51	109.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.706		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.066	0	1044849	15	>100:1			1001.00	1102.43	106.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.066		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	0	321581	15	>100:1			1001.00	1059.92	101.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.118		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.466		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.387	2.397	0	232805	17	>100:1			5005.00	5083.72	92.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.397		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.431	2.440	0	987056	17	>100:1			1001.00	1181.05	114.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.440		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	0	889255	18	>100:1			5005.00	5376.93	99.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	0/0	1672	12	5.0:1	Target = 0.67		13.484	13.484		
285 > 185	66	2.561	2.553		1454	11	6.0:1	1.14 (0.33-1.00)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.817	2.818	0	1002366	18	>100:1			1001.00	1110.40	110.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.818		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.826	2.836	0	289989	19	>100:1			1001.00	1068.14	95.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.836		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.862		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.208		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.171	3.176	0	229987	22	>100:1			5005.00	5177.70	93.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.177	3.176	1/1	7320	19	28:1	Target = 1.38		21.579	21.579		M
427 > 81	64	3.158	3.176		5375	16	46:1	1.36 (0.69-2.07)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.196	3.202	0	1002257	22	>100:1			1001.00	1117.28	108.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.202		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.564	3.572	0	246618	19	>100:1			1001.00	1082.96	106.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													s
499 > 80	54		3.572		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.768	3.774	0/0	2583	19	20:1			3.6526	3.6526		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.908		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.200		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.356	4.365	0/0	1755	12	12:1			2.7784	2.7784		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.699		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.564	3.579	0	1098031	21	>100:1			1001.00	1234.58	121.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.579		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.863	1	554424	19	>100:1			1001.00	1230.26	120.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.863		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.900	3.908	0	173794	19	>100:1			5005.00	5331.67	102.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.908		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.497		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.915	3.915	1	886626	19	>100:1			1001.00	1169.29	106.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.915		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.068	4.077	0	1027928	16	>100:1			5005.00	5140.99	109.2	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.077		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.216	4.225	0	1038594	18	>100:1			5005.00	5783.27	108.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.225		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.216	4.225	0	837860	17	>100:1			1001.00	1121.12	104.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.217		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	0	177998	14	>100:1			1001.00	1023.87	100.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.291		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.300	4.300	0	67266	14	>100:1			1001.00	1080.41	108.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.300		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.442	4.443	0	165824	16	>100:1			1001.00	1046.66	105.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.456		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	0	67009	22	>100:1			1001.00	1097.71	104.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.473		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.489	4.489	0	828207	18	>100:1			1001.00	1069.75	105.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.489		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.720	4.726	0/0	1818	16	7.8:1	Target = 3.17		5.1804	5.1804		
663 > 169	38	4.720	4.726		636	15	7.2:1	2.85 (1.58-4.76)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.940	4.941	0	910023	17	>100:1			1001.00	1100.88	107.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.940	4.941	0/0	5563	15	7.3:1	Target = 9.00		7.6101	7.6101		
713 > 169	42	4.940	4.941		638	12	9.3:1	8.71 (4.50-13.50)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.313	5.322	0	550350	17	>100:1			1001.00	1078.50	104.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.321	5.331	0/0	15157	16	15:1	Target = 13.39		17.916	17.916		
813 > 269	40	5.321	5.331		1077	15	13:1	14.07 (6.69-20.08)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.687	5.693	0/0	8862	17	7.5:1	Target = 116.83		13.327	13.327		
913 > 319	40	5.679	5.693		103	14	7.6:1	86.03 (58.41-175.25)					
*** 37 13C2_PFDA**													
515 > 470		3.915	3.915	1	882198	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.431	2.440	0	911703	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.196	3.196	1	994647	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.699	1.700	0	1022048	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.564	3.572	0	254258	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit
s - Detector Saturated or Negative Concentration
M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721022.d
Injection Date: 27-Jun-2021 13:49:40 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 42
Sample Info: ICV 500_SVLC-1555 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	960189	986843			102.8	50 - 150
8 PFBA			500.00	504.29	100.9	70 - 130
D 50 13C5_PFPeA	979583	988982			101	50 - 150
21 PFPeA			500.00	529.56	105.9	70 - 130
7 PFBS			442.50	434.15	98.1	70 - 130
D 44 13C3_PFBS	316591	313576			99	50 - 150
1 4:2 FTS			467.50	528.21	113	70 - 130
D 63 13C2_4:2 FTS_2	251776	225681			89.6	50 - 150
D 49 13C5_PFHxA	862788	863369			100.1	50 - 150
15 PFHxA			500.00	498.82	99.8	70 - 130
22 PFPeS			470.00	466.08	99.2	70 - 130
28 GenX			2500.00	2405.42	96.2	70 - 130
D 66 13C3_GenX	897310	837700			93.4	50 - 150
D 47 13C4_PFHpA	907666	905547			99.8	50 - 150
13 PFHpA			500.00	499.84	100	70 - 130
D 45 13C3_PFHxS	303002	273547			90.3	50 - 150
14 PFHxS			456.00	472.04	103.5	70 - 130
29 ADONA			2355.00	2487.99	105.6	70 - 130
D 64 13C2_6:2 FTS_2	244810	223085			91.1	50 - 150
2 6:2 FTS			475.00	501.72	105.6	70 - 130
20 PFOA			500.00	519.09	103.8	70 - 130
D 53 13C8_PFOA	921507	935702			101.5	50 - 150
12 PFHpS			475.00	490.56	103.3	70 - 130
18 PFOS			462.75	458.98	99.2	70 - 130
D 54 13C8_PFOS	232494	245861			105.7	50 - 150
17 PFNA			500.00	490.77	98.2	70 - 130
D 56 13C9_PFNA	901596	956364			106.1	50 - 150
30 9Cl-PF3ONS			2330.00	2320.74	99.6	70 - 130
D 55 13C8_PFOSA	459073	454297			99	50 - 150
19 PFOSA			500.00	512.23	102.4	70 - 130
16 PFNS			480.00	510.85	106.4	70 - 130
D 65 13C2_8:2 FTS_2	168869	171085			101.3	50 - 150
3 8:2 FTS			480.00	489.60	102	70 - 130
10 PFDA			500.00	529.20	105.8	70 - 130
D 51 13C6_PFDA	831393	785347			94.5	50 - 150
6 N-MeFOSAA			500.00	479.35	95.9	70 - 130

Report Date: 28-Jun-2021 12:59:59 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721022.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	941259	980469			104.2	50 - 150
9 PFDS			482.50	476.08	98.7	70 - 130
25 PFUdA			500.00	550.11	110	70 - 130
5 N-EtFOSAA			500.00	521.40	104.3	70 - 130
D 60 d5-EtFOSAA	956597	989506			103.4	50 - 150
D 52 13C7_PFUdA	803090	756368			94.2	50 - 150
D 61 d7-MeFOSE	176335	183996			104.3	50 - 150
D 57 d3-MeFOSA	62206	70555			113.4	50 - 150
31 11Cl-PF3OUDS			2355.00	1897.37	80.6	70 - 130
D 62 d9-EtFOSE	156993	164870			105	50 - 150
D 59 d5-EtFOSA	64110	61428			95.8	50 - 150
11 PFDoA			500.00	494.69	98.9	70 - 130
D 38 13C2_PFDoA	788291	816520			103.6	50 - 150
4 10:2 FTS			2410.00	2318.42	96.2	70 - 130
24 PFTrDA			500.00	509.12	101.8	70 - 130
23 PFTeDA			500.00	529.87	106	70 - 130
D 42 13C2_PFTeDA	844286	855133			101.3	50 - 150
D 40 13C2_PFHxDA	524461	533177			101.7	50 - 150

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721022.d
Injection Date: 27-Jun-2021 13:49:40 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 42
Sample Info: ICV 500_SVLC-1555 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.700	0	986843	19	>100:1			1000.00	1066.20	102.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.699	1.706	0/0	504264	20	>100:1			500.00	504.29		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.065	2.066	0	988982	16	>100:1			1000.00	1043.49	101	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.065	2.066	0/0	522536	15	>100:1			500.00	529.56		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.117	2.118	0	313576	15	>100:1			1000.00	1033.53	99	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.117	2.118	0/0	188185	15	>100:1	Target = 3.79		442.50	434.15		
298.9 > 99	44	2.117	2.118		53364	15	>100:1	3.52 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.465	2.466	0/0	148705	18	>100:1	Target = 3.30		470.00	466.08		
349 > 99	44	2.465	2.466		46596	22	>100:1	3.19 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.396	2.397	0	225681	17	>100:1			5000.00	4928.16	89.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.396	2.397	0/0	41899	15	>100:1	Target = 1.48		467.50	528.21		
327 > 81	63	2.396	2.397		32142	19	>100:1	1.30 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.439	2.440	0	863369	17	>100:1			1000.00	1033.05	100.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.439	2.440	0/0	417105	17	>100:1	Target = 16.51		500.00	498.82		
313 > 119	49	2.439	2.440		28490	16	>100:1	14.64 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.552	2.553	0	837700	18	>100:1			5000.00	5065.20	93.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.552	2.553	0/0	281258	19	>100:1	Target = 0.69		2500.00	2405.42		
285 > 185	66	2.552	2.553		418936	17	>100:1	0.67 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.818	0	905547	18	>100:1			1000.00	1003.14	99.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	414847	19	>100:1	Target = 3.47		500.00	499.84		
363 > 169	47	2.809	2.818		126029	17	>100:1	3.29 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	273547	18	>100:1			1000.00	1007.57	90.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.836	0/0	143554	32	>100:1	Target = 3.30	0.16	456.00	472.04		
399 > 99	45	2.836	2.836		43103	28	>100:1	3.33 (1.65-4.95)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.853	2.862	0/0	3447803	17	>100:1	Target = 2.54		2355.00	2487.99		
377 > 85	45	2.853	2.862		1356026	18	>100:1	2.54 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.202	3.208	0/0	131688	22	>100:1	Target = 3.54		475.00	490.56		
449 > 99	45	3.202	3.208		39119	24	>100:1	3.36 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.170	3.176	0	223085	21	>100:1			5000.00	5022.32	91.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.176	3.176	0/0	44577	23	>100:1	Target = 1.46		475.00	501.72		
427 > 81	64	3.170	3.176		28951	20	>100:1	1.53 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.195	3.202	0	935702	22	>100:1			1000.00	1043.08	101.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.195	3.202	0/0	486165	22	>100:1	Target = 2.72		500.00	519.09		
413 > 169	53	3.195	3.202		187833	29	>100:1	2.58 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.570	3.572	0	245861	19	>100:1			1000.00	1079.64	105.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.570	3.572	0/0	128702	45	>100:1	Target = 3.88		462.75	458.98		M
499 > 99	54	3.563	3.572		32060	41	>100:1	4.01 (1.94-5.83)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.767	3.774	0/0	1637740	21	>100:1			2330.00	2320.74		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.900	3.908	0/0	106203	23	>100:1	Target = 3.09		480.00	510.85		
549 > 99	54	3.900	3.908		31033	18	>100:1	3.42 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.198	4.200	0/0	116009	18	>100:1	Target = 3.32		482.50	476.08		
599 > 99	54	4.198	4.200		36828	16	>100:1	3.15 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.355	4.365	0/0	1195984	16	>100:1			2355.00	1897.37		
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.570	3.579	0	956364	21	>100:1			1000.00	1075.29	106.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.570	3.579	0/0	398136	19	>100:1	Target = 4.81		500.00	490.77		
463 > 169	56	3.570	3.579		90451	19	>100:1	4.40 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.863	0	454297	19	>100:1			1000.00	1008.08	99	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.862	3.863	0/0	237115	18	>100:1	Target = 40.56		500.00	512.23		
498>478	55	3.855	3.863		5706	23	33:1	41.55 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.900	3.908	0	171085	19	>100:1			5000.00	5248.56	101.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.907	3.908	0/0	27072	19	>100:1	Target = 1.50		480.00	489.60		
527 > 81	65	3.907	3.908		17681	22	>100:1	1.53 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.496	4.497	0/0	157046	18		Target = 2.24		2410.00	2318.42		
627 > 80	65	4.496	4.497		72883	18	>100:1	2.15 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.915	3.915	0	785347	18	>100:1			1000.00	1035.72	94.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.915	3.915	0/0	378232	17	>100:1	Target = 9.65		500.00	529.20		
513 > 169	51	3.915	3.915		34803	20	>100:1	10.86 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.067	4.077	0	980469	16	>100:1			5000.00	4903.63	104.2	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.067	4.077	0/0	72225	15	>100:1	Target = 1.47		500.00	479.35		
570 > 483	58	4.067	4.077		51231	16	>100:1	1.40 (0.73-2.21)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.215	4.225	0	989506	17	>100:1			5000.00	5509.93	103.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.224	4.225	0/0	103065	19	>100:1	Target = 1.78		500.00	521.40		
584 > 526	60	4.234	4.225		55104	15	>100:1	1.87 (0.89-2.67)					
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.215	4.225	0	756368	18	>100:1			1000.00	1012.08	94.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.215	4.217	0/0	367271	18	>100:1	Target = 9.77		500.00	550.11		
563 > 169	52	4.215	4.217		39321	22	>100:1	9.34 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.281	4.282	0	183996	23	>100:1			1000.00	1058.37	104.3	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.299	4.300	0	70555	17	>100:1			1000.00	1133.23	113.4	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.442	4.443	0	164870	21	>100:1			1000.00	1040.64	105	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	0	61428	16	>100:1			1000.00	1006.28	95.8	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.480	4.489	0	816520	19	>100:1			1000.00	1054.65	103.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.488	4.489	0/0	388687	17	>100:1	Target = 7.48		500.00	494.69		
613 > 169	38	4.488	4.489		54208	18	>100:1	7.17 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.719	4.726	0/0	176322	18	>100:1	Target = 3.23		500.00	509.12		
663 > 169	38	4.719	4.726		62537	19	>100:1	2.81 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.932	4.941	0	855133	16	>100:1			1000.00	1034.47	101.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.932	4.941	0/0	364332	16	39:1	Target = 8.62		500.00	529.87		
713 > 169	42	4.932	4.941		39665	17	>100:1	9.18 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.313	5.322	0	533177	17	>100:1			1000.00	1044.85	101.7	
*** 37 13C2_PFDA**													
515 > 470		3.907	3.915	0	764373	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.430	2.440	0	859848	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.196	1	923102	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.699	1.700	0	917106	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.563	3.572	0	231591	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\062721-DOD+ICAL.b\062721023.d
Injection Date: 27-Jun-2021 14:00:15 Injection Vol: 10.0 uL
Sample Type: CheckStd Auto Sampler: 31
Sample Info: ISOMERS_SVLC-1487 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Surrogates Conc. Level: Smp Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.700	0	1097777	19	>100:1			100000	1186.05	114.3	
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.065	2.066	0	1121871	14	>100:1			100000	1183.70	114.5	
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	0	370628	16	>100:1			100000	1221.57	117.1	
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.396	2.397	0	284644	17	>100:1			500000	6215.72	113.1	
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.431	2.440	0	907492	17	>100:1			100000	1085.85	105.2	
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.552	2.553	0	976218	18	>100:1			500000	5902.76	108.8	
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.810	2.818	0	1068120	18	>100:1			100000	1183.24	117.7	
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	323809	19	>100:1			100000	1192.71	106.9	
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.164	3.176	0	275955	23	>100:1			500000	6212.58	112.7	
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.196	3.202	0	1064639	22	>100:1			100000	1186.82	115.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.196	3.202	0/0	11383715	35	>100:1	Target = 2.55	0.15	0	1068265		
413 > 169	53	3.196	3.202		4532485	35	>100:1	2.51 (1.28-3.83)	0.22				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.564	3.572	0	274723	20	>100:1			100000	1206.38	118.2	
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.572	3.579	0	1076128	20	>100:1			100000	1209.95	119.4	
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.863	0	507716	18	>100:1			100000	1126.61	110.6	
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	1	216993	19	>100:1			500000	6656.93	128.5	
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.908	3.915	0	971192	19	>100:1			100000	1280.82	116.8	
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.077	0	1185503	16	>100:1			500000	5929.07	125.9	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.069	4.077	0/0	2264457	34	>100:1	Target = 1.44	0.08	0	1242960		M
570 > 483	58	4.069	4.077		1584538	33	>100:1	1.42 (0.72-2.16)	0.24				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.217	4.225	0	1288216	17	>100:1			500000	7173.25	134.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.226	4.225	1/1	2879991	36	>100:1	Target = 1.98		0	1119141		M
584 > 526	60	4.226	4.225		1605280	33	>100:1	1.79 (0.99-2.97)	0.22				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.217	4.225	0	963922	16	>100:1			100000	1289.80	120	
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.282	1	201727	15	>100:1			100000	1160.37	114.4	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.300	1	70815	14	>100:1			100000	1137.41	113.8	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	200463	17	>100:1			100000	1265.30	127.7	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	77050	15	>100:1			100000	1262.20	120.2	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.481	4.489	0	1076244	17	>100:1			100000	1390.12	136.5	
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.933	4.941	0	1077394	17	>100:1			100000	1303.35	127.6	
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.314	5.322	0	613403	18	>100:1			100000	1202.06	117	
*** 37 13C2_PFDA**													
515 > 470		3.908	3.915	0	1004667	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.431	2.440	0	950637	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.196	3.196	1	1180801	23	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.699	1.700	0	1137750	18	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.564	3.572	0	297523	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 01-Jul-2021 00:30:19 Cal End Date: 01-Jul-2021 02:06:17
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	063021072.d	F.L ICAL 50_SVLC-1545A	01-Jul-2021 00:30:19
2	063021073.d	F.L ICAL 100_SVLC-1546	01-Jul-2021 00:40:58
3	063021074.d	F.L ICAL 200_SVLC-1547	01-Jul-2021 00:51:35
4	063021075.d	F.L ICAL 500_SVLC-1548	01-Jul-2021 01:02:15
5	063021076.d	F.L ICAL 1000_SVLC-1549	01-Jul-2021 01:12:56
6	063021077.d	F.L ICAL 2000_SVLC-1550	01-Jul-2021 01:23:35
7	063021078.d	F.L ICAL 5000_SVLC-1551	01-Jul-2021 01:34:13
8	063021079.d	F.L ICAL 10000_SVLC-1552	01-Jul-2021 01:44:57
9	063021080.d	F.L ICAL 15000_SVLC-1553	01-Jul-2021 01:55:37
10	063021081.d	F.L ICAL 20000_SVLC-1554	01-Jul-2021 02:06:17

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.588	2.971	2.965	3.395	3.352	3.333	3.400	3.437	3.498	3.327	3.326	2.727-3.976	0.20826	1.676
1 4:2 FTS	1.000	1.041	1.766	1.738	2.122	1.927	1.780	1.966	1.800	1.816	1.695	1.011-3.232	0.37002	1.061
15 PFHxA	17.714	17.198	17.481	18.348	19.876	18.802	17.272	17.849	18.197	18.283	18.102	17.375-22.376	0.83347	9.938
22 PFPeS	3.368	2.747	2.968	2.949	2.982	3.030	2.885	2.976	2.951	3.073	2.992	2.523-3.440	0.15279	1.491
28 GenX	0.640	0.869	0.764	0.815	0.793	0.787	0.783	0.779	0.767	0.761	0.775	0.627-0.958	0.05505	0.396
13 PFHpA	5.095	3.951	4.012	3.752	3.431	3.685	3.573	3.521	3.766	3.656	3.844	2.050-4.811	0.46004	1.715
14 PFHxS	1.798	3.300	3.070	3.016	3.192	3.206	2.990	2.965	3.043	2.991	2.957	1.937-4.446	0.41804	1.596
29 ADONA	2.945	3.026	3.030	2.908	2.946	3.062	3.020	3.016	2.787	2.782	2.952	2.623-3.268	0.10735	1.473
2 6:2 FTS	Disabled	1.636	2.022	1.950	1.915	1.922	1.790	1.798	1.823	1.853	1.856	1.596-2.233	0.10628	0.957
20 PFOA	2.607	2.320	2.780	2.779	3.114	2.807	2.675	2.832	2.669	2.781	2.736	2.529-3.698	0.19494	1.557
12 PFHpS	2.805	2.567	2.900	2.706	2.890	2.789	2.985	2.950	2.987	2.939	2.851	2.399-3.380	0.16344	1.445
18 PFOS	3.927	3.564	3.479	3.453	3.706	3.572	3.445	3.416	3.579	3.403	3.554	3.235-4.176	0.15681	1.853
17 PFNA	5.595	7.241	5.633	6.491	6.447	6.483	6.044	6.079	6.187	6.188	6.238	5.073-7.820	0.45798	3.223
19 PFOSA	27.866	33.714	25.523	28.696	26.992	30.864	34.353	32.080	31.011	32.427	30.352	18.124-35.859	2.95581	13.496
3 8:2 FTS	1.683	2.117	1.092	1.762	1.894	1.685	1.817	1.834	1.929	1.823	1.763	1.097-2.690	0.26534	0.947
16 PFNS	5.196	1.850	3.036	2.389	2.643	2.554	2.733	2.765	2.582	2.754	2.850	0.050-5.235	0.86426	1.321
10 PFDA	11.722	14.901	16.550	14.323	12.970	14.178	13.315	13.481	12.742	13.008	13.719	9.037-16.902	1.31069	6.485
6 N-MeFOSAA	3.534	1.749	1.262	1.336	1.426	1.313	1.515	1.430	1.354	1.343	1.626	-0.630-3.482	0.68550	0.713
9 PFDS	3.350	3.779	3.027	2.860	2.561	2.667	2.735	2.718	2.696	2.665	2.905	1.305-3.816	0.41837	1.280
25 PFUdA	11.919	13.897	11.631	12.031	14.227	14.143	12.807	13.510	13.795	13.911	13.187	10.772-17.681	1.15164	7.113
5 N-EtFOSAA	2.075	1.307	1.748	1.607	1.615	1.652	1.803	1.583	1.598	1.549	1.653	1.034-2.195	0.19337	0.807
26 MeFOSA	1.019	0.797	1.029	0.992	1.256	1.126	1.092	0.989	1.037	0.982	1.031	0.903-1.608	0.11766	0.628
27 EtFOSA	0.783	1.164	0.754	0.836	0.968	0.958	0.973	0.994	0.929	0.967	0.932	0.601-1.334	0.12223	0.484
11 PFDoA	12.526	9.992	10.586	11.274	11.402	10.168	10.166	10.445	10.101	9.118	10.577	8.686-14.117	0.90522	5.701
4 10:2 FTS	3.189	3.798	2.754	3.057	3.198	2.829	3.333	3.312	3.271	3.257	3.199	2.350-4.045	0.28245	1.599
34 PFDOS	2.895	2.965	2.773	2.879	3.155	2.925	2.976	3.072	3.154	3.024	2.981	2.786-3.523	0.12296	1.577
24 PFTrDA	7.321	7.904	8.132	7.009	7.310	7.381	7.827	7.584	7.423	7.430	7.532	6.185-8.434	0.37495	3.655
23 PFTeDA	9.843	10.499	11.209	9.962	10.688	10.752	11.097	10.389	9.994	10.241	10.467	9.189-12.186	0.49942	5.344
35 PFHxDA	8.782	10.188	10.413	11.092	10.604	9.995	10.704	10.416	10.410	10.088	10.269	8.714-12.493	0.62968	5.302
36 PFODA	12.384	12.756	13.290	12.895	12.959	12.988	12.485	12.520	12.352	12.040	12.666	11.830-14.087	0.37603	6.479

Report Date: 02-Jul-2021 12:42:23 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 01-Jul-2021 00:30:19 Cal End Date: 01-Jul-2021 02:06:17

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	063021072.d	F.L ICAL 50_SVLC-1545A	01-Jul-2021 00:30:19
2	063021073.d	F.L ICAL 100_SVLC-1546	01-Jul-2021 00:40:58
3	063021074.d	F.L ICAL 200_SVLC-1547	01-Jul-2021 00:51:35
4	063021075.d	F.L ICAL 500_SVLC-1548	01-Jul-2021 01:02:15
5	063021076.d	F.L ICAL 1000_SVLC-1549	01-Jul-2021 01:12:56
6	063021077.d	F.L ICAL 2000_SVLC-1550	01-Jul-2021 01:23:35
7	063021078.d	F.L ICAL 5000_SVLC-1551	01-Jul-2021 01:34:13
8	063021079.d	F.L ICAL 10000_SVLC-1552	01-Jul-2021 01:44:57
9	063021080.d	F.L ICAL 15000_SVLC-1553	01-Jul-2021 01:55:37
10	063021081.d	F.L ICAL 20000_SVLC-1554	01-Jul-2021 02:06:17

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	513	541	544	562	526	538	522	522	510	502	Avg:A Wt:C2	528		RSD=3.5	
	97.3	102.4	103	106.6	99.7	101.9	98.8	98.9	96.5	95	Org:N Dep:R				
8 PFBA	1.070403	0.986267	0.989702	0.987890	0.967316	1.005780	0.992816	0.998457	1.007303	0.979571	Avg:A Wt:C2	0.998551		RSD=2.8	
	107.2	98.8	99.1	98.9	96.9	100.7	99.4	100	100.9	98.1	Org:N Dep:R				
D 50 13C5_PFPeA	538	579	569	621	554	554	536	544	542	526	Avg:A Wt:C2	556		RSD=5.0	
	96.7	104.2	102.2	111.6	99.6	99.5	96.4	97.8	97.5	94.5	Org:N Dep:R				
21 PFPeA	1.110692	0.981788	1.037542	0.970129	1.003398	1.056161	1.046265	1.041567	1.004395	1.039106	Avg:A Wt:C2	1.029104		RSD=4.0	
	107.9	95.4	100.8	94.3	97.5	102.6	101.7	101.2	97.6	101	Org:N Dep:R				
D 44 13C3_PFBS	188	195	203	210	206	196	192	200	188	183	Avg:A Wt:C2	196		RSD=4.4	
	95.9	99.3	103.5	106.9	105.1	100.2	97.7	102	95.9	93.5	Org:N Dep:R				
7 PFBS	1.433341	1.317140	1.272957	1.306582	1.202111	1.314150	1.310359	1.316569	1.362741	1.333788	Avg:A Wt:C2	1.316974		RSD=4.5	
	108.8	100	96.7	99.2	91.3	99.8	99.5	100	103.5	101.3	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	2.570653	1.683475	2.100453	1.856258	2.434686	2.052736	2.039524	2.142062	2.078511	2.060340	Avg:A Wt:C2	2.101870		RSD=12.0	
	122.3	80.1	99.9	88.3	115.8	97.7	97	101.9	98.9	98	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	21.1746	22.6474	22.8410	25.3832	21.5572	21.2726	21.7132	22.3200	20.5032	21.0100	Avg:A Wt:C2	22.0422		RSD=6.3	
	96.1	102.7	103.6	115.2	97.8	96.5	98.5	101.3	93	95.3	Org:N Dep:R				
D 49 13C5_PFHxA	578	601	622	643	628	588	597	593	592	582	Avg:A Wt:C2	602		RSD=3.5	
	95.9	99.9	103.3	106.7	104.2	97.7	99.1	98.5	98.3	96.5	Org:N Dep:R				
15 PFHxA	1.148364	1.076242	1.035776	1.015682	0.961773	1.038516	0.967810	0.961561	0.963072	0.989617	Avg:A Wt:C2	1.015841		RSD=6.0	
	113	105.9	102	100	94.7	102.2	95.3	94.7	94.8	97.4	Org:N Dep:R				
22 PFPeS	1.037841	0.823038	0.868478	0.925335	0.833359	0.953867	0.898385	0.898744	0.959761	0.984545	Avg:A Wt:C2	0.918335		RSD=7.4	
	113	89.6	94.6	100.8	90.7	103.9	97.8	97.9	104.5	107.2	Org:N Dep:R				
28 GenX	0.652607	0.721133	0.705531	0.680038	0.682913	0.665011	0.690191	0.668839	0.688668	0.676869	Avg:A Wt:C2	0.683180		RSD=2.9	
	95.5	105.6	103.3	99.5	100	97.3	101	97.9	100.8	99.1	Org:N Dep:R				
D 66 13C3_GenX	214	230	223	245	223	234	225	230	214	209	Avg:A Wt:C2	225		RSD=4.8	
	95.4	102.2	99.1	109.1	99.2	104.2	100.1	102.3	95.4	93	Org:N Dep:R				
13 PFHpA	1.207744	1.180818	1.104914	1.108041	1.025979	1.061270	1.076319	1.016818	1.050906	1.074864	Avg:A Wt:C2	1.090767		RSD=5.7	
	110.7	108.3	101.3	101.6	94.1	97.3	98.7	93.2	96.3	98.5	Org:N Dep:R				
D 47 13C4_PFHpA	476	482	506	535	499	528	506	521	498	479	Avg:A Wt:C2	503		RSD=4.0	
	94.7	95.9	100.6	106.3	99.1	105	100.6	103.5	99.1	95.3	Org:N Dep:R				
14 PFHxS	0.836690	1.083357	1.035178	1.093769	1.113019	1.117513	1.054933	1.138525	1.103719	1.092775	Avg:A Wt:C2	1.066948		RSD=8.1	
	78.4	101.5	97	102.5	104.3	104.7	98.9	106.7	103.4	102.4	Org:N Dep:R				
D 45 13C3_PFHxS	155	152	165	170	163	167	160	157	150	151	Avg:A Wt:C2	159		RSD=4.6	
	97.4	95.5	103.9	107	102.3	105.3	100.6	99	94.1	95	Org:N Dep:R				
29 ADONA	6.114304	6.104743	5.998661	5.923730	5.668896	5.823642	5.784557	6.023837	5.909187	5.650421	Avg:A Wt:C2	5.900198		RSD=2.8	
	103.6	103.5	101.7	100.4	96.1	98.7	98	102.1	100.2	95.8	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	18.9870	20.6324	20.3126	22.3840	19.9670	19.9544	19.0496	19.8904	18.5294	17.3240	Avg:A Wt:C2	19.7031		RSD=6.9	
	96.4	104.7	103.1	113.6	101.3	101.3	96.7	101	94	87.9	Org:N Dep:R				
2 6:2 FTS	Disabled	3.588535	3.147015	2.836659	2.543437	2.404718	2.327147	2.124167	2.217550	2.318660	Ln:A Wt:C2	2.320178	132	R^2=0.995	
	Disabled	94.8	105.7	110.3	103.6	100.7	99.1	91	95.2	99.6	Org:N Dep:R			RSE=6.4	
D 53 13C8_PFOA	511	535	562	581	519	526	518	515	472	469	Avg:A Wt:C2	521		RSD=6.6	
	98.2	102.8	108	111.6	99.6	100.9	99.5	98.8	90.7	90	Org:N Dep:R				
20 PFOA	0.981743	0.838726	0.895099	0.914599	0.997476	0.973870	0.899803	0.966731	0.971618	0.972323	Avg:A Wt:C2	0.941199		RSD=5.4	
	104.3	89.1	95.1	97.2	106	103.5	95.6	102.7	103.2	103.3	Org:N Dep:R				
12 PFHpS	1.061389	1.076430	1.065624	0.987206	0.987086	0.938533	0.973993	0.981956	0.971172	0.914821	Avg:A Wt:C2	0.995821		RSD=5.5	
	106.6	108.1	107	99.1	99.1	94.2	97.8	98.6	97.5	91.9	Org:N Dep:R				
D 54 13C8_PFOS	156	158	169	168	160	163	161	152	158	149	Avg:A Wt:C2	159		RSD=3.9	
	97.7	99.4	105.9	105.3	100.1	102.4	100.8	95.6	99.2	93.6	Org:N Dep:R				
18 PFOS	1.318548	1.222199	1.213276	1.202555	1.076324	1.111259	1.153953	1.158824	1.048119	1.196651	Avg:A Wt:C2	1.170171		RSD=6.7	
	112.7	104.4	103.7	102.8	92	95	98.6	99	89.6	102.3	Org:N Dep:R				
17 PFNA	1.044232	0.967825	0.965812	1.043073	1.031600	1.001324	0.993761	1.007863	0.999652	1.018107	Avg:A Wt:C2	1.007325		RSD=2.8	
	103.7	96.1	95.9	103.5	102.4	99.4	98.7	100.1	99.2	101.1	Org:N Dep:R				
D 56 13C9_PFNA	634	656	696	672	654	686	669	660	632	617	Avg:A Wt:C2	658		RSD=3.8	
	96.4	99.8	105.9	102.2	99.4	104.2	101.7	100.3	96.1	93.9	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.922000	3.585453	3.385988	3.360976	3.456702	3.494706	3.390665	3.891099	3.454732	3.718092	Avg:A Wt:C2	3.566041		RSD=5.8	
	110	100.5	95	94.2	96.9	98	95.1	109.1	96.9	104.3	Org:N Dep:R				
D 55 13C8_PFOSA	313	326	331	333	327	334	333	315	318	304	Avg:A Wt:C2	323		RSD=3.3	
	96.7	100.8	102.5	103	101	103.3	103	97.3	98.4	93.9	Org:N Dep:R				
19 PFOSA	1.029846	1.000770	0.970226	1.058221	0.951097	0.970895	0.962384	1.005259	1.026108	1.099252	Avg:A Wt:C2	1.007406		RSD=4.7	
	102.2	99.3	96.3	105	94.4	96.4	95.5	99.8	101.9	109.1	Org:N Dep:R				
3 8:2 FTS	2.006228	2.489494	1.587948	2.014564	2.122402	1.933823	2.149640	2.041920	1.870171	2.051627	Avg:A Wt:C2	2.026782		RSD=11.2	
	99	122.8	78.3	99.4	104.7	95.4	106.1	100.7	92.3	101.2	Org:N Dep:R				
16 PFNS	1.045805	0.711912	0.776469	0.753068	0.775314	0.796774	0.818089	0.855330	0.757262	0.796799	Avg:A Wt:C2	0.808682		RSD=11.4	
	129.3	88	96	93.1	95.9	98.5	101.2	105.8	93.6	98.5	Org:N Dep:R				
10 PFDA	1.187555	1.222447	1.044954	1.061117	1.009865	1.080607	1.100883	1.072053	1.086256	0.985384	Avg:A Wt:C2	1.085112		RSD=6.7	
	109.4	112.7	96.3	97.8	93.1	99.6	101.5	98.8	100.1	90.8	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	18.3562	20.0844	20.0854	22.2648	19.1574	20.1916	19.1660	19.2082	20.7298	18.2086	Avg:A Wt:C2	19.7452		RSD=6.1	
	93	101.7	101.7	112.8	97	102.3	97.1	97.3	105	92.2	Org:N Dep:R				
D 51 13C6_PFDA	589	613	630	674	633	638	592	602	589	604	Avg:A Wt:C2	616		RSD=4.4	
	95.5	99.4	102.2	109.4	102.7	103.4	96.1	97.6	95.5	98	Org:N Dep:R				
D 58 d3-MeFOSAA	155	169	166	172	158	167	161	167	168	172	Avg:A Wt:C2	165		RSD=3.4	
	93.8	101.9	100.1	104.2	95.6	101	97.3	101	101.5	103.7	Org:N Dep:R				
6 N-MeFOSAA	1.118001	0.842367	0.716917	0.782696	0.792381	0.791800	0.855593	0.776042	0.741053	0.723178	Ln:A Wt:C2	0.754651	15.2510	R^2=0.991	
	107.7	91.4	84.9	99.7	103	103.9	113	102.6	98.1	95.7	Org:N Dep:R			RSE=8.5	
9 PFDS	0.909368	0.904168	0.877773	0.844685	0.776632	0.779185	0.787089	0.844148	0.751692	0.791674	Avg:A Wt:C2	0.826642		RSD=6.9	
	110	109.4	106.2	102.2	94	94.3	95.2	102.1	90.9	95.8	Org:N Dep:R				
D 52 13C7_PFUdA	638	636	679	701	665	681	638	633	618	571	Avg:A Wt:C2	646		RSD=5.8	
	98.8	98.4	105.1	108.6	103	105.4	98.8	97.9	95.7	88.4	Org:N Dep:R				
D 60 d5-EtFOSAA	146	144	153	153	147	155	145	147	132	124	Avg:A Wt:C2	145		RSD=6.7	
	101.1	99.4	106	105.8	101.5	107.1	100	101.8	91.5	85.9	Org:N Dep:R				
25 PFUdA	0.892101	0.937662	0.819286	0.872151	0.885125	0.856639	0.878381	0.891436	0.855029	0.931947	Avg:A Wt:C2	0.881976		RSD=4.0	
	101.1	106.3	92.9	98.9	100.4	97.1	99.6	101.1	96.9	105.7	Org:N Dep:R				
5 N-EtFOSAA	1.079750	0.754321	1.035445	0.931592	0.830452	0.878443	1.009223	0.917671	0.965905	0.967323	Avg:A Wt:C2	0.937012		RSD=10.4	
	115.2	80.5	110.5	99.4	88.6	93.7	107.7	97.9	103.1	103.2	Org:N Dep:R				
D 61 d7-MeFOSE	87.2470	96.7650	91.7290	99.7890	87.0730	96.4040	96.0800	99.9850	100	97.9120	Avg:A Wt:C2	95.2988		RSD=5.2	
	91.6	101.5	96.3	104.7	91.4	101.2	100.8	104.9	104.9	102.7	Org:N Dep:R				
32 MeFOSE	1.249327	0.938976	1.062750	1.129624	1.185833	1.069193	1.076443	1.061566	1.000567	1.010378	Avg:A Wt:C2	1.078466		RSD=8.4	
	115.8	87.1	98.5	104.7	110	99.1	99.8	98.4	92.8	93.7	Org:N Dep:R				
D 57 d3-MeFOSA	54.9550	58.7280	52.3420	54.4950	53.2720	56.0770	58.0650	59.2310	63.0590	55.9390	Avg:A Wt:C2	56.6163		RSD=5.7	
	97.1	103.7	92.5	96.3	94.1	99	102.6	104.6	111.4	98.8	Org:N Dep:R				
26 MeFOSA	0.960786	0.888673	1.240209	1.088614	1.205830	1.164506	1.088063	1.023513	0.967957	1.037725	Avg:A Wt:C2	1.066588		RSD=10.6	
	90.1	83.3	116.3	102.1	113.1	109.2	102	96	90.8	97.3	Org:N Dep:R				
31 11Cl-PF3OUDS	3.106336	3.210693	3.015403	3.104902	3.105287	3.068038	3.041358	3.319840	3.110154	3.093563	Avg:A Wt:C2	3.117557		RSD=2.8	
	99.6	103	96.7	99.6	99.6	98.4	97.6	106.5	99.8	99.2	Org:N Dep:R				
D 62 d9-EtFOSE	103	102	101	108	112	111	107	108	104	106	Avg:A Wt:C2	106		RSD=3.5	
	97	96.2	94.8	101.5	105.2	105	100.8	101.7	98	99.8	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 59 d5-EtFOSA	47.6270	51.5980	49.1170	58.2680	50.1900	54.1330	58.0570	47.9660	48.2920	47.8250	Avg:A Wt:C2	51.3073		RSD=8.1	
	92.8	100.6	95.7	113.6	97.8	105.5	113.2	93.5	94.1	93.2	Org:N Dep:R				
33 EtFOSE	0.837924	1.072296	1.129568	1.041462	1.016309	1.054148	1.029935	1.065284	1.090789	1.083696	Avg:A Wt:C2	1.042141		RSD=7.6	
	80.4	102.9	108.4	99.9	97.5	101.2	98.8	102.2	104.7	104	Org:N Dep:R				
27 EtFOSA	1.127932	1.327958	0.960564	0.905849	1.122674	1.048676	0.957917	1.183922	1.121522	1.143882	Avg:A Wt:C2	1.090090		RSD=11.5	
	103.5	121.8	88.1	83.1	103	96.2	87.9	108.6	102.9	104.9	Org:N Dep:R				
D 38 13C2_PFDoA	658	641	640	671	629	671	641	613	638	616	Avg:A Wt:C2	642		RSD=3.1	
	102.6	99.9	99.7	104.5	98.1	104.5	99.9	95.5	99.4	95.9	Org:N Dep:R				
11 PFDoA	1.064321	1.056113	1.033076	1.031876	1.054346	0.989883	1.040967	1.034533	0.942515	0.948453	Avg:A Wt:C2	1.019608		RSD=4.3	
	104.4	103.6	101.3	101.2	103.4	97.1	102.1	101.5	92.4	93	Org:N Dep:R				
4 10:2 FTS	3.302558	2.415119	2.384011	2.076757	2.343060	2.180537	2.382894	2.397916	2.178951	2.321477	Ln:A Wt:C2	2.220086	44.1522	R^2=0.993	
	107.5	88.2	97.1	89.4	103.5	97.2	106.9	107.8	98	104.5	Org:N Dep:R			RSE=7.7	
34 PFDOS	0.824319	0.932310	0.897063	0.838291	0.852075	0.862021	0.865765	0.933069	0.892499	0.899600	Avg:A Wt:C2	0.879701		RSD=4.2	
	93.7	106	102	95.3	96.9	98	98.4	106.1	101.5	102.3	Org:N Dep:R				
24 PFTrDA	0.900371	0.947976	0.960550	0.928034	0.903692	0.916237	0.949421	0.957678	0.883265	0.859696	Avg:A Wt:C2	0.920692		RSD=3.7	
	97.8	103	104.3	100.8	98.2	99.5	103.1	104	95.9	93.4	Org:N Dep:R				
D 42 13C2_PFTeDA	793	843	850	867	815	848	837	853	831	805	Avg:A Wt:C2	834		RSD=2.8	
	95	101	101.9	103.9	97.7	101.7	100.3	102.3	99.7	96.5	Org:N Dep:R				
23 PFTeDA	0.835331	0.817111	0.820536	0.813463	0.813556	0.814962	0.815581	0.783035	0.744429	0.776616	Avg:A Wt:C2	0.803462		RSD=3.4	
	104	101.7	102.1	101.2	101.3	101.4	101.5	97.5	92.7	96.7	Org:N Dep:R				
35 PFHxDA	0.737311	0.666802	0.617925	0.588475	0.601665	0.583826	0.611774	0.599172	0.571979	0.571684	Avg:A Wt:C2	0.615061		RSD=8.3	
	119.9	108.4	100.5	95.7	97.8	94.9	99.5	97.4	93	92.9	Org:N Dep:R				
D 40 13C2_PFHxDA	921	969	981	1055	985	999	965	979	986	938	Avg:A Wt:C2	978		RSD=3.7	
	94.2	99.1	100.3	107.9	100.7	102.1	98.7	100.1	100.8	95.9	Org:N Dep:R				
36 PFODA	0.904679	0.935855	0.918282	0.880236	0.877306	0.912674	0.910570	0.914473	0.890749	0.917046	Avg:A Wt:C2	0.906187		RSD=2.0	
	99.8	103.3	101.3	97.1	96.8	100.7	100.5	100.9	98.3	101.2	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 01-Jul-2021 00:30:19 Cal End Date: 01-Jul-2021 02:06:17
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	063021072.d	F.L ICAL 50_SVLC-1545A	01-Jul-2021 00:30:19
2	063021073.d	F.L ICAL 100_SVLC-1546	01-Jul-2021 00:40:58
3	063021074.d	F.L ICAL 200_SVLC-1547	01-Jul-2021 00:51:35
4	063021075.d	F.L ICAL 500_SVLC-1548	01-Jul-2021 01:02:15
5	063021076.d	F.L ICAL 1000_SVLC-1549	01-Jul-2021 01:12:56
6	063021077.d	F.L ICAL 2000_SVLC-1550	01-Jul-2021 01:23:35
7	063021078.d	F.L ICAL 5000_SVLC-1551	01-Jul-2021 01:34:13
8	063021079.d	F.L ICAL 10000_SVLC-1552	01-Jul-2021 01:44:57
9	063021080.d	F.L ICAL 15000_SVLC-1553	01-Jul-2021 01:55:37
10	063021081.d	F.L ICAL 20000_SVLC-1554	01-Jul-2021 02:06:17

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	680650	678400	655568	698280	647390	691436	680369	679781	634201	654837	0.96
* 39 13C2_PFHxA	573362	576446	619206	617991	571679	610958	594836	595723	572088	569176	0.18
* 41 13C2_PFOA	527216	544288	550798	571768	555340	534365	530755	513171	494666	501544	1.24
* 43 13C3_PFBA	472450	479116	491805	507291	470376	475559	470981	486867	463088	456801	0.84
* 48 13C4_PFOS	143604	159427	160727	170711	159272	157217	161034	155372	150094	154819	1.87

13C2_PFDA ((|654837 - 680650| / (654837 + 680650)) / 2) * 100 = 0.97
13C2_PFHxA ((|569176 - 573362| / (569176 + 573362)) / 2) * 100 = 0.18
13C2_PFOA ((|501544 - 527216| / (501544 + 527216)) / 2) * 100 = 1.25
13C3_PFBA ((|456801 - 472450| / (456801 + 472450)) / 2) * 100 = 0.84
13C4_PFOS ((|154819 - 143604| / (154819 + 143604)) / 2) * 100 = 1.88

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 01-Jul-2021 00:30:19 Cal End Date: 01-Jul-2021 02:06:17
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	063021072.d	F.L ICAL 50_SVLC-1545A	01-Jul-2021 00:30:19
2	063021073.d	F.L ICAL 100_SVLC-1546	01-Jul-2021 00:40:58
3	063021074.d	F.L ICAL 200_SVLC-1547	01-Jul-2021 00:51:35
4	063021075.d	F.L ICAL 500_SVLC-1548	01-Jul-2021 01:02:15
5	063021076.d	F.L ICAL 1000_SVLC-1549	01-Jul-2021 01:12:56
6	063021077.d	F.L ICAL 2000_SVLC-1550	01-Jul-2021 01:23:35
7	063021078.d	F.L ICAL 5000_SVLC-1551	01-Jul-2021 01:34:13
8	063021079.d	F.L ICAL 10000_SVLC-1552	01-Jul-2021 01:44:57
9	063021080.d	F.L ICAL 15000_SVLC-1553	01-Jul-2021 01:55:37
10	063021081.d	F.L ICAL 20000_SVLC-1554	01-Jul-2021 02:06:17

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	513470	540746	543502	562498	526195	537880	521537	522095	509551	501612	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	27481	53332	107581	277843	508997	1081978	2588951	5212892	7699086	9827296	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	537809	579392	568748	620973	554204	553557	536051	544114	542298	525903	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	29867	56884	118020	301212	556087	1169291	2804258	5667311	8170217	10929377	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	188229	194881	203018	209640	206203	196495	191742	200217	188121	183417	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	11925	22691	45691	121069	219125	456540	1110529	2330220	3399337	4325223	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	2542	3561	8962	22004	49021	81570	206809	446553	597052	808615	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	105873	113237	114205	126916	107786	106363	108566	111600	102516	105050	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	577552	601491	621949	642636	627539	588335	596733	593459	592092	581529	
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	33162	64735	128840	326357	603550	1221991	2887620	5706473	8553412	11509817	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	573362	576446	619206	617991	571679	610958	594836	595723	572088	569176	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	9162	15045	33077	90980	161187	351619	807891	1687874	2540356	3387724	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	13986	33131	62851	166668	304498	622826	1552247	3074491	4428771	5657194	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1071549	1148574	1113540	1225431	1114703	1170707	1124506	1149190	1071820	1044735	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	28771	56957	111858	296298	511597	1121009	2725031	5297743	7857500	10303126	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	476442	482352	506184	534814	498643	528145	506361	521012	498459	479276	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	5888	14950	31109	84615	164608	340139	767271	1628879	2252587	3000161	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	154665	151645	165120	170024	162520	167237	159850	157219	149517	150849	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	44541	87206	186610	474380	867873	1834881	4355155	8921321	12484193	16058468	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	94935	103162	101563	111920	99835	99772	95248	99452	92647	86620	
2 6:2 FTS	Disabled	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	Disabled	7019	12120	30097	48144	90979	210130	400535	584298	761594	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	511315	535300	562273	581105	518596	525597	518434	514792	472187	468813	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	527216	544288	550798	571768	555340	534365	530755	513171	494666	501544	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	25099	44897	100658	265739	517287	1023726	2332443	4976654	6881782	9116756	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	7814	15540	33502	79896	152721	298847	741098	1469718	2073552	2627518	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	143604	159427	160727	170711	159272	157217	161034	155372	150094	154819	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	155801	158464	168813	167938	159637	163273	160717	152440	158266	149322	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	9532	17973	38014	93707	159450	336750	860534	1639323	2309071	3316419	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	33087	63525	134508	350662	674654	1373054	3324939	6650768	9478712	12570367	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	633710	656369	696347	672363	653988	685619	669163	659888	632134	617340	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	28475	52953	106546	263027	514294	1063582	2539409	5528243	7643797	10348797	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	312804	325769	331464	333112	326627	334113	333175	314593	318141	303598	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	16107	32602	64319	176253	310654	648777	1603212	3162474	4896703	6674613	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1764	4790	6111	21485	38952	74814	197348	375743	557100	715765	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	7821	10830	25167	60705	118818	249776	631108	1251711	1725823	2284410	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	34957	74893	131663	357744	639371	1377919	3259934	6449106	9593717	11907205	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	91781	100422	100427	111324	95787	100958	95830	96041	103649	91043	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	588722	612648	629994	674278	633125	637567	592240	601566	588794	604191	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	680650	678400	655568	698280	647390	691436	680369	679781	634201	654837	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	775581	843041	827781	861867	791027	835268	805033	835224	839712	857737	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	8671	14203	23738	67458	125359	264546	688781	1296337	1866813	2481186	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	6829	13812	28569	68374	119516	245280	609723	1240494	1720268	2279174	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	638403	635549	679146	701489	665255	680846	638408	632554	618472	571102	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	731558	718593	766506	765228	733932	774712	722998	735973	661686	621352	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	28476	59593	111283	305902	588834	1166478	2803828	5638812	7932172	10644739	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7899	10841	31747	71288	121899	272216	729666	1350762	1917377	2404192	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	87247	96765	91729	99789	87073	96404	96080	99985	100004	97912	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	5450	9086	19497	56362	103254	206149	517123	1061407	1500911	1978562	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	54955	58728	52342	54495	53272	56077	58065	59231	63059	55939	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	2640	5219	12983	29662	64237	130604	315892	606237	915576	1160986	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	22795	47927	95903	245594	466967	943748	2302238	4767240	6955233	8702893	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	102921	102052	100627	107714	111593	111427	106937	107933	103931	105872	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	47627	51598	49117	58268	50190	54133	58057	47966	48292	47825	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	4312	10943	22733	56090	113413	234921	550691	1149793	1700502	2294661	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2686	6852	9436	26391	56347	113536	278069	567880	812408	1094123	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	658373	641229	640185	670749	629301	670568	641386	612763	637755	615641	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	35036	67721	132272	346065	663501	1327568	3338307	6339238	9016408	11678130	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	2922	4676	9232	22287	43271	84887	220132	444015	653147	814982	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	6216	14301	29318	68138	131670	272482	673453	1376855	2050982	2600629	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	29639	60787	122986	311239	568694	1228798	3044728	5868298	8449596	10585278	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	792620	843056	850036	867149	815001	848229	836974	853471	831473	805081	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	33105	68887	139497	352697	663049	1382549	3413102	6682978	9284593	12504779	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	33943	64625	121220	310478	592656	1166166	2950413	5866485	8459100	10723036	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	920724	969178	980864	1055196	985027	998728	964544	979099	985946	937847	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41648	90701	180142	464411	864170	1823026	4391425	8953598	13173460	17200983	

Report Date: 02-Jul-2021 12:42:23 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 01-Jul-2021 00:30:19 Cal End Date: 01-Jul-2021 02:06:17

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	063021072.d	F.L ICAL 50_SVLC-1545A	01-Jul-2021 00:30:19
2	063021073.d	F.L ICAL 100_SVLC-1546	01-Jul-2021 00:40:58
3	063021074.d	F.L ICAL 200_SVLC-1547	01-Jul-2021 00:51:35
4	063021075.d	F.L ICAL 500_SVLC-1548	01-Jul-2021 01:02:15
5	063021076.d	F.L ICAL 1000_SVLC-1549	01-Jul-2021 01:12:56
6	063021077.d	F.L ICAL 2000_SVLC-1550	01-Jul-2021 01:23:35
7	063021078.d	F.L ICAL 5000_SVLC-1551	01-Jul-2021 01:34:13
8	063021079.d	F.L ICAL 10000_SVLC-1552	01-Jul-2021 01:44:57
9	063021080.d	F.L ICAL 15000_SVLC-1553	01-Jul-2021 01:55:37
10	063021081.d	F.L ICAL 20000_SVLC-1554	01-Jul-2021 02:06:17

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.711	1.711	1.711	1.711	1.705	1.704	1.705	1.705	1.711	1.712	1.708	0.207
8 PFBA	1.711	1.711	1.711	1.711	1.711	1.711	1.711	1.711	1.711	1.712	1.711	0.025
D 50 13C5_PFPeA	2.077	2.077	2.087	2.077	2.077	2.077	2.077	2.077	2.077	2.077	2.078	0.159
21 PFPeA	2.077	2.088	2.087	2.077	2.077	2.077	2.077	2.077	2.077	2.088	2.080	0.243
D 44 13C3_PFBS	2.130	2.141	2.140	2.130	2.130	2.130	2.130	2.130	2.130	2.130	2.132	0.211
7 PFBS	2.140	2.141	2.140	2.130	2.130	2.130	2.130	2.130	2.141	2.141	2.135	0.267
1 4:2 FTS	2.397	2.398	2.397	2.398	2.398	2.397	2.397	2.398	2.398	2.407	2.398	0.119
D 63 13C2_4:2 FTS_2	2.397	2.398	2.397	2.398	2.398	2.397	2.397	2.398	2.398	2.398	2.397	0.000
D 49 13C5_PFHxA	2.442	2.442	2.442	2.433	2.433	2.433	2.433	2.433	2.442	2.442	2.437	0.200
15 PFHxA	2.442	2.433	2.442	2.442	2.433	2.433	2.433	2.442	2.442	2.442	2.438	0.199
* 39 13C2_PFHxA	2.442	2.442	2.442	2.442	2.442	2.433	2.442	2.433	2.442	2.442	2.440	0.161
22 PFPeS	2.478	2.469	2.468	2.469	2.469	2.468	2.469	2.469	2.469	2.469	2.469	0.110
28 GenX	2.549	2.558	2.558	2.549	2.550	2.549	2.549	2.549	2.549	2.558	2.551	0.171
D 66 13C3_GenX	2.558	2.549	2.558	2.549	2.550	2.549	2.549	2.549	2.549	2.558	2.551	0.164
13 PFHpA	2.809	2.809	2.808	2.809	2.809	2.808	2.809	2.809	2.809	2.809	2.808	0.017
D 47 13C4_PFHpA	2.809	2.809	2.808	2.809	2.809	2.808	2.809	2.809	2.809	2.809	2.808	0.017
14 PFHxS	2.827	2.827	2.827	2.827	2.818	2.826	2.827	2.818	2.827	2.827	2.825	0.136
D 45 13C3_PFHxS	2.827	2.827	2.827	2.818	2.827	2.817	2.818	2.818	2.818	2.827	2.822	0.176
29 ADONA	2.854	2.845	2.845	2.845	2.846	2.845	2.845	2.845	2.845	2.854	2.847	0.140
D 64 13C2_6:2 FTS_2	3.167	3.168	3.165	3.167	3.160	3.165	3.167	3.161	3.161	3.168	3.164	0.107
2 6:2 FTS	Disabled	3.168	3.165	3.167	3.167	3.165	3.167	3.168	3.168	3.168	3.166	0.028
D 53 13C8_PFOA	3.194	3.194	3.192	3.194	3.187	3.192	3.187	3.188	3.188	3.194	3.191	0.108
* 41 13C2_PFOA	3.194	3.194	3.192	3.194	3.193	3.185	3.194	3.188	3.194	3.194	3.192	0.103
20 PFOA	3.194	3.194	3.199	3.194	3.193	3.192	3.194	3.188	3.194	3.194	3.193	0.087
12 PFHpS	3.194	3.194	3.199	3.194	3.193	3.198	3.194	3.194	3.201	3.201	3.196	0.095
* 48 13C4_PFOS	3.569	3.569	3.566	3.569	3.568	3.566	3.568	3.561	3.569	3.569	3.567	0.072
D 54 13C8_PFOS	3.569	3.569	3.566	3.569	3.568	3.566	3.568	3.569	3.569	3.569	3.568	0.027
18 PFOS	3.577	3.569	3.574	3.569	3.568	3.566	3.568	3.569	3.569	3.569	3.569	0.089
17 PFNA	3.577	3.577	3.574	3.577	3.576	3.574	3.576	3.569	3.577	3.577	3.575	0.074
D 56 13C9_PFNA	3.577	3.577	3.574	3.577	3.576	3.574	3.576	3.569	3.577	3.577	3.575	0.074
30 9Cl-PF3ONS	3.782	3.775	3.780	3.774	3.773	3.780	3.781	3.775	3.775	3.783	3.777	0.093
D 55 13C8_PFOSA	3.871	3.863	3.868	3.862	3.861	3.868	3.861	3.863	3.863	3.863	3.864	0.089
19 PFOSA	3.862	3.863	3.868	3.862	3.861	3.860	3.861	3.863	3.863	3.863	3.862	0.062

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
3 8:2 FTS	3.945	3.920	3.917	3.920	3.910	3.917	3.919	3.920	3.912	3.921	3.920	0.235
16 PFNS	3.912	3.912	3.917	3.912	3.910	3.917	3.910	3.912	3.912	3.912	3.912	0.067
10 PFDA	3.928	3.920	3.926	3.928	3.918	3.926	3.927	3.928	3.921	3.929	3.925	0.098
D 65 13C2_8:2 FTS_2	3.920	3.920	3.917	3.912	3.918	3.917	3.910	3.912	3.912	3.921	3.916	0.103
D 51 13C6_PFDA	3.920	3.920	3.926	3.928	3.926	3.926	3.927	3.920	3.921	3.921	3.923	0.086
* 37 13C2_PFDA	3.928	3.920	3.926	3.928	3.926	3.926	3.927	3.920	3.921	3.929	3.925	0.086
D 58 d3-MeFOSAA	4.080	4.080	4.076	4.080	4.078	4.085	4.079	4.080	4.081	4.081	4.079	0.056
6 N-MeFOSAA	4.089	4.089	4.093	4.089	4.087	4.085	4.087	4.089	4.090	4.081	4.087	0.083
9 PFDS	4.226	4.216	4.221	4.216	4.214	4.221	4.225	4.216	4.217	4.217	4.219	0.101
D 52 13C7_PFUdA	4.237	4.237	4.232	4.237	4.235	4.242	4.235	4.237	4.237	4.237	4.236	0.058
D 60 d5-EtFOSAA	4.237	4.237	4.242	4.237	4.235	4.242	4.245	4.237	4.237	4.237	4.238	0.076
25 PFUdA	4.237	4.237	4.242	4.237	4.235	4.242	4.235	4.237	4.237	4.237	4.237	0.052
5 N-EtFOSAA	4.247	4.247	4.242	4.247	4.245	4.242	4.245	4.247	4.248	4.247	4.245	0.055
D 61 d7-MeFOSE	4.297	4.298	4.292	4.298	4.296	4.302	4.296	4.298	4.298	4.298	4.297	0.059
32 MeFOSE	4.307	4.308	4.313	4.308	4.306	4.313	4.306	4.308	4.308	4.308	4.308	0.051
D 57 d3-MeFOSA	4.318	4.318	4.313	4.318	4.316	4.313	4.316	4.318	4.318	4.318	4.316	0.051
26 MeFOSA	4.318	4.318	4.323	4.318	4.326	4.323	4.316	4.318	4.318	4.318	4.319	0.075
31 11Cl-PF3OUDS	4.375	4.375	4.378	4.375	4.381	4.378	4.381	4.383	4.383	4.376	4.378	0.078
D 62 d9-EtFOSE	4.463	4.463	4.459	4.463	4.462	4.468	4.462	4.463	4.464	4.464	4.463	0.051
D 59 d5-EtFOSA	4.490	4.481	4.486	4.481	4.480	4.486	4.489	4.481	4.482	4.482	4.483	0.081
33 EtFOSE	4.481	4.481	4.477	4.472	4.480	4.477	4.480	4.472	4.473	4.473	4.476	0.086
27 EtFOSA	4.490	4.490	4.495	4.490	4.489	4.495	4.489	4.490	4.491	4.491	4.490	0.046
D 38 13C2_PFDoA	4.508	4.508	4.513	4.508	4.507	4.513	4.516	4.508	4.509	4.509	4.509	0.061
11 PFDoA	4.508	4.508	4.513	4.508	4.516	4.513	4.516	4.517	4.509	4.509	4.511	0.079
4 10:2 FTS	4.526	4.517	4.522	4.526	4.516	4.522	4.525	4.526	4.527	4.518	4.522	0.096
34 PFDOS	4.728	4.721	4.725	4.728	4.727	4.725	4.727	4.728	4.728	4.728	4.726	0.047
24 PFTrDA	4.755	4.755	4.752	4.755	4.754	4.752	4.754	4.755	4.755	4.755	4.754	0.026
D 42 13C2_PFTeDA	4.973	4.973	4.971	4.974	4.973	4.971	4.972	4.973	4.976	4.974	4.973	0.029
23 PFTeDA	4.973	4.973	4.978	4.974	4.973	4.978	4.979	4.973	4.976	4.974	4.975	0.045
35 PFHxDA	5.364	5.365	5.368	5.364	5.364	5.368	5.372	5.364	5.367	5.364	5.366	0.053
D 40 13C2_PFHxDA	5.364	5.365	5.368	5.364	5.364	5.368	5.364	5.364	5.367	5.364	5.365	0.037
36 PFODA	5.740	5.733	5.737	5.740	5.733	5.737	5.740	5.740	5.736	5.740	5.737	0.053

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021072.d
Injection Date: 01-Jul-2021 00:30:19 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 1 Auto Sampler: 61
Sample Info: F.L ICAL 50_SVLC-1545A Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.705	1	513470	22	>100:1			1000.00	972.65	97.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/-1	27481	22	22:1			50.000	53.598		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	0	537809	18	>100:1			1000.00	966.75	97	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.077	0/0	29867	17	37:1			50.000	53.964		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.130	0	188229	15	>100:1			1000.00	959.39	91.3	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.130	1/1	11925	15	>100:1	Target = 3.32		44.200	48.105		
298.9 > 99	44	2.140	2.130		3323	18	25:1	3.58 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.469	1/1	9162	26	87:1	Target = 2.99		46.900	53.003		
349 > 99	44	2.469	2.469		2720	16	23:1	3.36 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.398	0	105873	20	>100:1			5000.00	4803.19	98.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.398	0/0	2542	24	39:1	Target = 1.69		46.700	57.116		
327 > 81	63	2.397	2.398		2542	24	33:1	1.00 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.433	1	577552	19	>100:1			1000.00	958.86	92	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.433	1/0	33162	17	84:1	Target = 18.10		50.000	56.523		
313 > 119	49	2.451	2.433		1872	20	18:1	17.71 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.550	1	1071549	19	>100:1			5000.00	4768.90	96.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.549	2.550	0/-1	13986	17	86:1	Target = 0.77		100.00	95.525		
285 > 185	66	2.549	2.550		21825	20	>100:1	0.64 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	476442	19	>100:1			1000.00	946.88	95.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.809	0/0	28771	19	53:1	Target = 3.84		50.000	55.362		
363 > 169	47	2.818	2.809		5646	24	38:1	5.09 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.827	0	154665	18	>100:1			1000.00	973.56	95.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.818	1/1	5888	15	77:1	Target = 2.95		45.500	35.681		
399 > 99	45	2.827	2.818		3274	22	20:1	1.79 (1.47-4.43)	0.20				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.854	2.846	1/1	44541	25	>100:1	Target = 2.95		47.100	48.809		
377 > 85	45	2.854	2.846		15124	22	>100:1	2.94 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.194	3.193	1/1	7814	28	68:1	Target = 2.85		47.600	50.734		
449 > 99	45	3.201	3.193		2785	16	20:1	2.80 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.167	3.160	1	94935	24	>100:1			5000.00	4818.28	95.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.161	3.167	0/-1	6698	17	48:1	Target = 1.85		47.400	95.317		M
427 > 81	64	3.161	3.167		3031	18	18:1	2.20 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.194	3.187	1	511315	23	>100:1			1000.00	981.71	98.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.194	3.193	1/0	25099	18	13:1	Target = 2.73		50.000	52.154		M
413 > 169	53	3.201	3.193		9627	19	79:1	2.60 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.569	3.568	1	155801	20	>100:1			1000.00	977.01	97.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.577	3.568	1/0	9532	40	25:1	Target = 3.55	0.30	46.400	52.283		
499 > 99	54	3.577	3.568		2427	31	10:1	3.92 (1.77-5.33)	0.10				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.782	3.773	1/0	28475	18	>100:1			46.600	51.252		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.912	3.910	1/0	7821	20	32:1	Target = 2.84		48.000	62.075		
549 > 99	54	3.903	3.910		1505	16	8.0:1	5.19 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.226	4.214	1/0	6829	25	31:1	Target = 2.90		48.200	53.024		
599 > 99	54	4.226	4.214		2038	19		3.35 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.375	4.381	0/-1	22795	18	83:1			47.100	46.930		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.728	4.727	1/0	6216	18	57:1	Target = 2.98		48.400	45.353		
699 > 99	54	4.721	4.727		2147	20	40:1	2.89 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.577	3.576	1	633710	19	>100:1			1000.00	963.54	96.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.577	3.576	1/0	33087	27	76:1	Target = 6.23		50.000	51.832		
463 > 169	56	3.577	3.576		5913	25	35:1	5.59 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.861	1	312804	20				1000.00	967.42	95.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.862	3.861	1/0	16107	22	62:1	Target = 30.35		50.000	51.114		
498>478	55	3.862	3.861		578	14	3.8:1	27.86 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.920	3.918	1	91781	18	>100:1			5000.00	4648.26	95.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.945	3.910	3/2	1764	17	13:1	Target = 1.76		47.900	47.414		M
527 > 81	65	3.912	3.910		1048	12	7.5:1	1.68 (0.88-2.64)					M
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.526	4.516	1/0	2922	21	37:1	Target = 3.19		48.200	51.814		
627 > 80	65	4.508	4.516		916	14	14:1	3.18 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.920	3.926	0	588722	18	>100:1			1000.00	955.23	93	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.928	3.918	1/1	34957	22	45:1	Target = 13.71		50.000	54.720		
513 > 169	51	3.912	3.918		2982	12	23:1	11.72 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.080	4.078	1	775581	17	>100:1			5000.00	4687.84	98	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.089	4.087	1/0	8671	28	73:1	Target = 1.62	0.10	50.000	53.865		M
570 > 483	58	4.080	4.087		2453	29		3.53 (0.81-2.43)	0.12				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.237	4.235	1	731558	17	>100:1			5000.00	5057.41	99.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.247	4.245	1/0	7899	31	58:1	Target = 1.65	0.05	50.000	57.617		
584 > 526	60	4.247	4.245		3806	31	15:1	2.07 (0.82-2.48)	0.15				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.237	4.235	1	638403	16	>100:1			1000.00	988.05	96	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.237	4.235	1/0	28476	21	76:1	Target = 13.18		50.000	50.574		
563 > 169	52	4.247	4.235		2389	16	27:1	11.91 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.297	4.296	1	87247	15	>100:1			1000.00	915.51	100.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.307	4.306	1/0	5450	20	33:1			50.000	57.921		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.316	1	54955	17	>100:1			1000.00	970.66	103.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.326	0/-1	2640	23	18:1	Target = 1.03		50.000	45.040		
512 > 219	57	4.328	4.326		2590	18	27:1	1.01 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.463	4.462	1	102921	17	>100:1			1000.00	970.03	92.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.481	4.480	1/0	4312	11	33:1			50.000	40.202		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.490	4.480	1	47627	16	>100:1			1000.00	928.27	94.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.490	4.489	1/0	2686	18	16:1	Target = 0.93		50.000	51.736		
526 > 219	59	4.490	4.489		3430	18	21:1	0.78 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.508	4.507	1	658373	17	>100:1			1000.00	1025.83	104.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.508	4.516	0/-1	35036	16	25:1	Target = 10.57		50.000	52.193		
613 > 169	38	4.508	4.516		2797	21	22:1	12.52 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.755	4.754	1/0	29639	22	>100:1	Target = 7.53		50.000	48.896		
663 > 169	38	4.748	4.754		4048	25	38:1	7.32 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.973	4.973	1	792620	18	>100:1			1000.00	950.03	97.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.973	4.973	1/0	33105	18	44:1	Target = 10.46		50.000	51.983		
713 > 169	42	4.973	4.973		3363	19	71:1	9.84 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.364	5.364	1	920724	18	>100:1			1000.00	941.71	93.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.364	5.364	1/0	33943	19	7.7:1	Target = 10.26		50.000	59.938		
813 > 269	40	5.364	5.364		3865	20	>100:1	8.78 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.740	5.733	1/0	41648	22	>100:1	Target = 12.66		50.000	49.917		
913 > 319	40	5.733	5.733		3363	26	>100:1	12.38 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.928	3.926	1	680650	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	573362	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.194	3.193	1	527216	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	472450	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.569	3.568	1	143604	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021073.d
Injection Date: 01-Jul-2021 00:40:58 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 2 Auto Sampler: 62
Sample Info: F.L ICAL 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.705	1	540746	23	>100:1			1000.00	1024.32	102.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	1/0	53332	20	39:1			100.00	98.770		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	579392	17	>100:1			1000.00	1041.50	104.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.077	1/0	56884	18	>100:1			100.00	95.402		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.130	1	194881	16	>100:1			1000.00	993.30	94.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.130	1/0	22691	16	>100:1	Target = 3.32		88.400	88.411		
298.9 > 99	44	2.141	2.130		7637	19	64:1	2.97 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.469	2.469	1/0	15045	23	>100:1	Target = 2.99		93.800	84.066		
349 > 99	44	2.460	2.469		5476	23	41:1	2.74 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	113237	17	>100:1			5000.00	5137.27	105.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	0/0	3561	17	56:1	Target = 1.69		93.400	74.808		
327 > 81	63	2.415	2.398		3418	19	42:1	1.04 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.433	1	601491	19	>100:1			1000.00	998.60	95.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.433	0/-1	64735	25	>100:1	Target = 18.10		100.00	105.95		
313 > 119	49	2.442	2.433		3764	13	18:1	17.19 (9.05-27.15)					M
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.549	2.550	0	1148574	19	>100:1			5000.00	5111.70	103	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.550	1/1	33131	19	>100:1	Target = 0.77		200.00	211.11		
285 > 185	66	2.558	2.550		38086	18	>100:1	0.86 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	482352	18	>100:1			1000.00	958.63	96.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.809	0/0	56957	18	>100:1	Target = 3.84		100.00	108.26		
363 > 169	47	2.809	2.809		14413	20	>100:1	3.95 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.827	0	151645	19	>100:1			1000.00	954.56	93.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.818	1/1	14950	25	>100:1	Target = 2.95	0.16	91.000	92.400		M
399 > 99	45	2.845	2.818		4529	24	42:1	3.30 (1.47-4.43)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.846	0/0	87206	20	>100:1	Target = 2.95		94.200	97.466		
377 > 85	45	2.845	2.846		28818	21	>100:1	3.02 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.194	3.193	1/1	15540	27	93:1	Target = 2.85		95.200	102.91		
449 > 99	45	3.208	3.193		6053	22	72:1	2.56 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.168	3.160	1	103162	23	>100:1			5000.00	5235.83	103.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.168	3.167	1/0	7019	18	98:1	Target = 1.85		94.800	89.897		M
427 > 81	64	3.168	3.167		4290	17	24:1	1.63 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.194	3.187	1	535300	22	>100:1			1000.00	1027.76	103.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.194	3.193	1/0	44897	19	32:1	Target = 2.73		100.00	89.113		
413 > 169	53	3.194	3.193		19346	23	>100:1	2.32 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.569	3.568	1	158464	19	>100:1			1000.00	993.71	99.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.569	3.568	1/0	17973	34	70:1	Target = 3.55	0.28	92.800	96.926		
499 > 99	54	3.569	3.568		5042	36	20:1	3.56 (1.77-5.33)	0.15				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.773	1/0	52953	20	>100:1			93.200	93.707		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.912	3.910	1/0	10830	17	95:1	Target = 2.84		96.000	84.512		
549 > 99	54	3.912	3.910		5853	24	17:1	1.85 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.216	4.214	1/0	13812	16	62:1	Target = 2.90		96.400	105.44		
599 > 99	54	4.226	4.214		3654	12	17:1	3.77 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.375	4.381	0/-1	47927	17	>100:1			94.200	97.014		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.721	4.727	0/-1	14301	19	>100:1	Target = 2.98		96.800	102.59		
699 > 99	54	4.721	4.727		4822	26		2.96 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.577	3.576	1	656369	20	>100:1			1000.00	997.99	100.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.577	3.576	1/0	63525	20	99:1	Target = 6.23		100.00	96.079		
463 > 169	56	3.569	3.576		8772	18	77:1	7.24 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.861	1	325769	20				1000.00	1007.51	99.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.861	1/0	32602	18	>100:1	Target = 30.35		100.00	99.341		
498>478	55	3.854	3.861		967	17		33.71 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.920	3.918	1	100422	17	>100:1			5000.00	5085.88	104.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.920	3.910	1/0	4790	15	22:1	Target = 1.76		95.800	117.67		
527 > 81	65	3.912	3.910		2262	22	23:1	2.11 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.517	4.516	1/0	4676	14	39:1	Target = 3.19		96.400	84.981		
627 > 80	65	4.517	4.516		1231	15	15:1	3.79 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.920	3.926	0	612648	20	>100:1			1000.00	994.05	96.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.920	3.918	1/1	74893	19	>100:1	Target = 13.71		100.00	112.66		
513 > 169	51	3.912	3.918		5026	18	39:1	14.90 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.080	4.078	1	843041	17	>100:1			5000.00	5095.58	106.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.089	4.087	1/0	14203	24	>100:1	Target = 1.62	0.08	100.00	91.414		
570 > 483	58	4.089	4.087		8120	28	26:1	1.74 (0.81-2.43)	0.13				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.237	4.235	1	718593	17	>100:1			5000.00	4967.78	97.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.247	4.245	1/0	10841	12	25:1	Target = 1.65		100.00	80.503		
584 > 526	60	4.237	4.245		8293	27	25:1	1.30 (0.82-2.48)	0.22				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.237	4.235	1	635549	15	>100:1			1000.00	983.64	95.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.237	4.235	1/0	59593	15	>100:1	Target = 13.18		100.00	106.31		
563 > 169	52	4.237	4.235		4288	19	37:1	13.89 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.296	1	96765	14	>100:1			1000.00	1015.39	111.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.308	4.306	1/0	9086	13	41:1			100.00	87.066		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.316	1	58728	15	>100:1			1000.00	1037.30	110.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.326	0/-1	5219	21	44:1	Target = 1.03		100.00	83.319		
512 > 219	57	4.328	4.326		6546	20	28:1	0.79 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.463	4.462	1	102052	19	>100:1			1000.00	961.84	91.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.481	4.480	1/0	10943	15	71:1			100.00	102.89		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.480	1	51598	17	>100:1			1000.00	1005.67	102.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.490	4.489	1/0	6852	19	44:1	Target = 0.93		100.00	121.82		
526 > 219	59	4.490	4.489		5886	19	44:1	1.16 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.508	4.507	1	641229	17	>100:1			1000.00	999.12	101.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.508	4.516	0/-1	67721	16	25:1	Target = 10.57		100.00	103.58		
613 > 169	38	4.508	4.516		6777	20	39:1	9.99 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.755	4.754	1/0	60787	20	>100:1	Target = 7.53		100.00	102.96		
663 > 169	38	4.748	4.754		7690	23	>100:1	7.90 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.973	4.973	1	843056	19	>100:1			1000.00	1010.48	103.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.973	4.973	1/0	68887	19	>100:1	Target = 10.46		100.00	101.70		
713 > 169	42	4.973	4.973		6561	19	73:1	10.49 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.365	5.364	1	969178	17	>100:1			1000.00	991.27	98.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.365	5.364	1/0	64625	20	13:1	Target = 10.26		100.00	108.41		
813 > 269	40	5.365	5.364		6343	24	>100:1	10.18 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.733	5.733	1/0	90701	30	9.8:1	Target = 12.66		100.00	103.27		M
913 > 319	40	5.733	5.733		7110	30	>100:1	12.75 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.920	3.926	0	678400	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	576446	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.194	3.193	1	544288	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	479116	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.569	3.568	1	159427	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021074.d
Injection Date: 01-Jul-2021 00:51:35 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 3 Auto Sampler: 63
Sample Info: F.L ICAL 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.705	1	543502	22	>100:1			1000.00	1029.54	103.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/-1	107581	22	99:1			200.00	198.23		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.087	2.077	1	568748	16	>100:1			1000.00	1022.37	102.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.087	2.077	1/0	118020	18	>100:1			200.00	201.64		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.130	1	203018	17	>100:1			1000.00	1034.77	98.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.130	1/0	45691	16	>100:1	Target = 3.32		176.80	170.89		
298.9 > 99	44	2.140	2.130		15405	20	>100:1	2.96 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.468	2.469	0/-1	33077	18	>100:1	Target = 2.99		187.60	177.41		
349 > 99	44	2.468	2.469		11141	17	84:1	2.96 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.398	0	114205	20	>100:1			5000.00	5181.19	106	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.398	0/0	8962	18		Target = 1.69		186.80	186.67		
327 > 81	63	2.406	2.398		5072	14	70:1	1.76 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.433	1	621949	19	>100:1			1000.00	1032.57	99.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.433	1/0	128840	19	>100:1	Target = 18.10		200.00	203.92		
313 > 119	49	2.442	2.433		7370	22	37:1	17.48 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.550	1	1113540	19	>100:1			5000.00	4955.78	99.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.550	1/0	62851	21	>100:1	Target = 0.77		400.00	413.09		
285 > 185	66	2.558	2.550		82222	19	>100:1	0.76 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.808	2.809	0	506184	18	>100:1			1000.00	1005.99	101.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.808	2.809	0/0	111858	19	>100:1	Target = 3.84		200.00	202.59		
363 > 169	47	2.817	2.809		27878	17	>100:1	4.01 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.827	0	165120	18				1000.00	1039.38	101.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.818	1/1	31109	25	>100:1	Target = 2.95	0.21	182.00	176.58		
399 > 99	45	2.827	2.818		10130	26	85:1	3.07 (1.47-4.43)	0.09				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.846	0/0	186610	19	>100:1	Target = 2.95		188.40	191.54		
377 > 85	45	2.845	2.846		61569	20	>100:1	3.03 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.199	3.193	1/1	33502	21	>100:1	Target = 2.85		190.40	203.75		
449 > 99	45	3.192	3.193		11552	19	66:1	2.90 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.165	3.160	1	101563	21	>100:1			5000.00	5154.68	101.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.165	3.167	0/-1	12120	18	>100:1	Target = 1.85		189.60	200.44		M
427 > 81	64	3.179	3.167		5993	22	27:1	2.02 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.192	3.187	1	562273	23	>100:1			1000.00	1079.55	108.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.199	3.193	1/0	100658	22	73:1	Target = 2.73		200.00	190.20		
413 > 169	53	3.192	3.193		36202	20	>100:1	2.78 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.566	3.568	0	168813	19	>100:1			1000.00	1058.61	105.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.574	3.568	1/1	38014	34	92:1	Target = 3.55	0.34	185.60	192.44		
499 > 99	54	3.566	3.568		10924	37	48:1	3.47 (1.77-5.33)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.780	3.773	1/1	106546	18	>100:1			186.40	176.99		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.917	3.910	1/1	25167	18	>100:1	Target = 2.84		192.00	184.35		
549 > 99	54	3.909	3.910		8287	17	52:1	3.03 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.221	4.214	1/1	28569	19	>100:1	Target = 2.90		192.80	204.73		
599 > 99	54	4.221	4.214		9438	15	89:1	3.02 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.378	4.381	0/0	95903	18	>100:1			188.40	182.23		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.725	4.727	0/0	29318	18	>100:1	Target = 2.98		193.60	197.42		
699 > 99	54	4.725	4.727		10572	17		2.77 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.574	3.576	0	696347	21	>100:1			1000.00	1058.77	106.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.574	3.576	0/0	134508	21	>100:1	Target = 6.23		200.00	191.76		
463 > 169	56	3.574	3.576		23875	22	99:1	5.63 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.861	1	331464	19	>100:1			1000.00	1025.13	101.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.868	3.861	1/0	64319	18	>100:1	Target = 30.35		200.00	192.62		
498>478	55	3.868	3.861		2520	17	25:1	25.52 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.917	3.918	0	100427	17				5000.00	5086.14	104.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.917	3.910	1/1	6111	22	36:1	Target = 1.76		191.60	150.12		
527 > 81	65	3.909	3.910		5596	24	45:1	1.09 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.522	4.516	1/1	9232	22		Target = 3.19		192.80	187.15		
627 > 80	65	4.522	4.516		3352	20	40:1	2.75 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.926	3.926	0	629994	19	>100:1			1000.00	1022.20	99.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.926	3.918	1/1	131663	20	>100:1	Target = 13.71		200.00	192.60		
513 > 169	51	3.926	3.918		7955	22	66:1	16.55 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.076	4.078	0	827781	19	>100:1			5000.00	5003.35	104.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.093	4.087	1/1	23738	28		Target = 1.62	0.11	200.00	169.79		
570 > 483	58	4.085	4.087		18802	33	63:1	1.26 (0.81-2.43)	0.19				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.242	4.235	1	766506	17	>100:1			5000.00	5299.01	104.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.242	4.245	0/-1	31747	33	>100:1	Target = 1.65		200.00	221.01		M
584 > 526	60	4.242	4.245		18160	33	55:1	1.74 (0.82-2.48)	0.11				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.232	4.235	0	679146	16	>100:1			1000.00	1051.11	102.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.242	4.235	1/1	111283	15	>100:1	Target = 13.18		200.00	185.78		
563 > 169	52	4.232	4.235		9567	13	75:1	11.63 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.296	0	91729	14	>100:1			1000.00	962.54	105.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.313	4.306	1/1	19497	14	62:1			200.00	197.09		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.313	4.316	0	52342	14	>100:1			1000.00	924.50	98.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.323	4.326	0/0	12983	15		Target = 1.03		200.00	232.56		
512 > 219	57	4.323	4.326		12610	15	80:1	1.02 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.462	0	100627	17	>100:1			1000.00	948.41	90.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.477	4.480	0/0	22733	14	>100:1			200.00	216.78		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.486	4.480	1	49117	15	>100:1			1000.00	957.31	97.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.495	4.489	1/0	9436	15	87:1	Target = 0.93		200.00	176.24		
526 > 219	59	4.495	4.489		12509	20	67:1	0.75 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.513	4.507	1	640185	17				1000.00	997.49	101.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.516	0/-1	132272	17	>100:1	Target = 10.57		200.00	202.64		
613 > 169	38	4.513	4.516		12494	22	>100:1	10.58 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.752	4.754	0/-1	122986	19	>100:1	Target = 7.53		200.00	208.66		
663 > 169	38	4.752	4.754		15122	17	>100:1	8.13 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.971	4.973	0	850036	19	>100:1			1000.00	1018.85	104.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.978	4.973	1/1	139497	18	23:1	Target = 10.46		200.00	204.25		
713 > 169	42	4.971	4.973		12445	21	>100:1	11.20 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.368	5.364	1	980864	18	>100:1			1000.00	1003.22	99.6	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.368	5.364	1/0	121220	17	24:1	Target = 10.26		200.00	200.93		
813 > 269	40	5.368	5.364		11641	19	>100:1	10.41 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.737	5.733	1/0	180142	23	18:1	Target = 12.66		200.00	202.67		
913 > 319	40	5.737	5.733		13554	25	>100:1	13.29 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.926	3.926	0	655568	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	619206	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.192	3.193	0	550798	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	491805	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.566	3.568	0	160727	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021075.d
Injection Date: 01-Jul-2021 01:02:15 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 4 Auto Sampler: 64
Sample Info: F.L ICAL 500_SVLC-1548 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.705	1	562498	22	>100:1			1000.00	1065.52	106.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/-1	277843	21	>100:1			500.00	494.66		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	620973	16	>100:1			1000.00	1116.25	112	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.077	1/0	301212	17	>100:1			500.00	471.35		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.130	1	209640	17	>100:1			1000.00	1068.52	101.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.130	1/0	121069	18	>100:1	Target = 3.32		442.00	438.51		
298.9 > 99	44	2.130	2.130		35659	16	>100:1	3.39 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.469	2.469	0/-1	90980	18	>100:1	Target = 2.99		469.00	472.57		
349 > 99	44	2.469	2.469		30851	18	>100:1	2.94 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	126916	19	>100:1			5000.00	5757.85	117.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	0/0	22004	17	>100:1	Target = 1.69		467.00	412.43		
327 > 81	63	2.398	2.398		12655	18	>100:1	1.73 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.433	0	642636	18	>100:1			1000.00	1066.91	102.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.433	1/1	326357	19	>100:1	Target = 18.10		500.00	499.92		
313 > 119	49	2.442	2.433		17787	19	>100:1	18.34 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.549	2.550	0	1225431	19	>100:1			5000.00	5453.75	109.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.549	2.550	0/0	166668	19	>100:1	Target = 0.77		1000.00	995.40		
285 > 185	66	2.549	2.550		204379	20	>100:1	0.81 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	534814	18	>100:1			1000.00	1062.89	107.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.809	0/0	296298	18	>100:1	Target = 3.84		500.00	507.92		
363 > 169	47	2.809	2.809		78958	20	>100:1	3.75 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.827	0	170024	18				1000.00	1070.24	104.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.818	1/1	84615	27	>100:1	Target = 2.95	0.19	455.00	466.44		
399 > 99	45	2.827	2.818		28053	24	>100:1	3.01 (1.47-4.43)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.846	0/0	474380	19	>100:1	Target = 2.95		471.00	472.88		
377 > 85	45	2.845	2.846		163095	19	>100:1	2.90 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.194	3.193	1/1	79896	21	>100:1	Target = 2.85		476.00	471.88		
449 > 99	45	3.201	3.193		29516	19	>100:1	2.70 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.167	3.160	1	111920	25	>100:1			5000.00	5680.33	112.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.167	3.167	1/0	30097	20	>100:1	Target = 1.85		474.00	522.79		
427 > 81	64	3.167	3.167		15428	22	>100:1	1.95 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.194	3.187	1	581105	22	>100:1			1000.00	1115.70	112.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.194	3.193	1/0	265739	22	>100:1	Target = 2.73		500.00	485.87		
413 > 169	53	3.194	3.193		95609	23	>100:1	2.77 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.569	3.568	1	167938	19	>100:1			1000.00	1053.12	105.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.569	3.568	1/0	93707	37	>100:1	Target = 3.55	0.22	464.00	476.84		M
499 > 99	54	3.577	3.568		27135	36	>100:1	3.45 (1.77-5.33)	0.13				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.774	3.773	1/0	263027	19	>100:1			466.00	439.20		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.912	3.910	1/0	60705	18	>100:1	Target = 2.84		480.00	446.99		
549 > 99	54	3.912	3.910		25404	16	73:1	2.38 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.216	4.214	1/0	68374	16	>100:1	Target = 2.90		482.00	492.52		
599 > 99	54	4.216	4.214		23905	24	>100:1	2.86 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.375	4.381	0/-1	245594	17	>100:1			471.00	469.09		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.728	4.727	1/0	68138	19	>100:1	Target = 2.98		484.00	461.22		
699 > 99	54	4.728	4.727		23664	20		2.87 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.577	3.576	1	672363	20	>100:1			1000.00	1022.31	102.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.577	3.576	1/0	350662	19	>100:1	Target = 6.23		500.00	517.74		
463 > 169	56	3.577	3.576		54022	16	>100:1	6.49 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.862	3.861	1	333112	20				1000.00	1030.22	102	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.862	3.861	1/0	176253	19	>100:1	Target = 30.35		500.00	525.22		
498>478	55	3.862	3.861		6142	21		28.69 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.912	3.918	0	111324	21	>100:1			5000.00	5638.02	116.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.920	3.910	1/1	21485	23	88:1	Target = 1.76		479.00	476.11		
527 > 81	65	3.920	3.910		12191	15	34:1	1.76 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.526	4.516	1/1	22287	12		Target = 3.19		482.00	430.99		M
627 > 80	65	4.508	4.516		7290	23	71:1	3.05 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.928	3.926	1	674278	19	>100:1			1000.00	1094.05	106.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.928	3.918	1/0	357744	18	>100:1	Target = 13.71		500.00	488.94		
513 > 169	51	3.928	3.918		24976	26	>100:1	14.32 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.080	4.078	1	861867	17	>100:1			5000.00	5209.37	109	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.089	4.087	1/0	67458	34		Target = 1.62	0.10	500.00	498.37		M
570 > 483	58	4.089	4.087		50473	33		1.33 (0.81-2.43)	0.16				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.237	4.235	1	765228	17	>100:1			5000.00	5290.18	104.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.247	4.245	1/0	71288	32		Target = 1.65		500.00	497.11		M
584 > 526	60	4.247	4.245		44350	31	>100:1	1.60 (0.82-2.48)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.237	4.235	1	701489	16	>100:1			1000.00	1085.69	105.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.237	4.235	1/0	305902	16	>100:1	Target = 13.18		500.00	494.43		
563 > 169	52	4.237	4.235		25426	16	>100:1	12.03 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.296	1	99789	15	>100:1			1000.00	1047.12	114.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.308	4.306	1/0	56362	17	>100:1			500.00	523.72		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.316	1	54495	13	>100:1			1000.00	962.53	102.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.326	0/-1	29662	17	>100:1	Target = 1.03		500.00	510.33		
512 > 219	57	4.318	4.326		29893	20	>100:1	0.99 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.463	4.462	1	107714	16	>100:1			1000.00	1015.21	96.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.472	4.480	0/-1	56090	16	>100:1			500.00	499.67		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.480	1	58268	17	>100:1			1000.00	1135.67	116.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.490	4.489	1/0	26391	15	>100:1	Target = 0.93		500.00	415.49		
526 > 219	59	4.490	4.489		31554	16	>100:1	0.83 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.508	4.507	1	670749	16	>100:1			1000.00	1045.11	106.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.508	4.516	0/-1	346065	17	>100:1	Target = 10.57		500.00	506.02		
613 > 169	38	4.508	4.516		30695	15	>100:1	11.27 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.755	4.754	1/0	311239	21	>100:1	Target = 7.53		500.00	503.99		
663 > 169	38	4.755	4.754		44404	19	>100:1	7.00 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.974	4.973	1	867149	19	>100:1			1000.00	1039.36	106.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.974	4.973	1/0	352697	19	43:1	Target = 10.46		500.00	506.22		
713 > 169	42	4.974	4.973		35402	21	>100:1	9.96 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.364	5.364	1	1055196	17	>100:1			1000.00	1079.25	107.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.364	5.364	1/0	310478	17	64:1	Target = 10.26		500.00	478.39		
813 > 269	40	5.364	5.364		27990	20	>100:1	11.09 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.740	5.733	1/0	464411	24	42:1	Target = 12.66		500.00	485.68		
913 > 319	40	5.733	5.733		36013	23	>100:1	12.89 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.928	3.926	1	698280	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	617991	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.194	3.193	1	571768	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	507291	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.569	3.568	1	170711	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021076.d
Injection Date: 01-Jul-2021 01:12:56 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 5 Auto Sampler: 65
Sample Info: F.L ICAL 1000_SVLC-1549 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.705	0	526195	23	>100:1			1000.00	996.75	100	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	508997	22	>100:1			1000.00	968.72		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	0	554204	17	>100:1			1000.00	996.22	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.077	0/0	556087	18	>100:1			1000.00	975.02		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.130	0	206203	16	>100:1			1000.00	1051.00	100	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.130	0/0	219125	15	>100:1	Target = 3.32		884.00	806.90		
298.9 > 99	44	2.130	2.130		65362	18	>100:1	3.35 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.469	2.469	0/0	161187	19	>100:1	Target = 2.99		938.00	851.20		
349 > 99	44	2.469	2.469		54038	17	>100:1	2.98 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	107786	19	>100:1			5000.00	4889.97	100	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	0/0	49021	25	>100:1	Target = 1.69		934.00	1081.89		
327 > 81	63	2.398	2.398		23099	21	>100:1	2.12 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.433	0	627539	18	>100:1			1000.00	1041.85	100	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.433	0/0	603550	19	>100:1	Target = 18.10		1000.00	946.77		
313 > 119	49	2.442	2.433		30365	24	>100:1	19.87 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.550	2.550	0	1114703	20	>100:1			5000.00	4960.96	100	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.550	2.550	0/0	304498	18	>100:1	Target = 0.77		2000.00	1999.22		
285 > 185	66	2.550	2.550		383657	18	>100:1	0.79 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	498643	19	>100:1			1000.00	991.01	100	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.809	0/0	511597	18	>100:1	Target = 3.84		1000.00	940.60		
363 > 169	47	2.809	2.809		149068	19	>100:1	3.43 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.827	0	162520	19	>100:1			1000.00	1023.01	100	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	0/0	164608	25	>100:1	Target = 2.95	0.14	910.00	949.29		
399 > 99	45	2.827	2.818		51553	27	>100:1	3.19 (1.47-4.43)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.846	2.846	0/0	867873	18	>100:1	Target = 2.95		942.00	905.07		
377 > 85	45	2.846	2.846		294586	19	>100:1	2.94 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.193	3.193	0/0	152721	30	>100:1	Target = 2.85		952.00	943.65		
449 > 99	45	3.193	3.193		52842	27	>100:1	2.89 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.160	3.160	0	99835	31	>100:1			5000.00	5066.97	100	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.167	3.167	0/0	48144	22	>100:1	Target = 1.85		948.00	982.50		
427 > 81	64	3.167	3.167		25130	20	>100:1	1.91 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.187	3.187	0	518596	23	>100:1			1000.00	995.69	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.193	3.193	0/0	517287	28	>100:1	Target = 2.73		1000.00	1059.79		
413 > 169	53	3.193	3.193		166064	21	>100:1	3.11 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.568	3.568	0	159637	20	>100:1			1000.00	1001.07	100	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.568	3.568	0/0	159450	36	>100:1	Target = 3.55	0.26	928.00	853.57		
499 > 99	54	3.568	3.568		43023	32	>100:1	3.70 (1.77-5.33)	0.08				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.773	3.773	0/0	514294	20	>100:1			932.00	903.42		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.910	3.910	0/0	118818	19	>100:1	Target = 2.84		960.00	920.39		
549 > 99	54	3.910	3.910		44943	16	>100:1	2.64 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.214	4.214	0/0	119516	15		Target = 2.90		964.00	905.68		
599 > 99	54	4.225	4.214		46658	14	>100:1	2.56 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.381	4.381	0/0	466967	17	>100:1			942.00	938.29		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.727	4.727	0/0	131670	18	>100:1	Target = 2.98		968.00	937.60		
699 > 99	54	4.727	4.727		41727	19		3.15 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.576	3.576	0	653988	20	>100:1			1000.00	994.37	100	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.576	3.576	0/0	674654	21	>100:1	Target = 6.23		1000.00	1024.10		
463 > 169	56	3.568	3.576		104643	17	>100:1	6.44 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.861	3.861	0	326627	18	>100:1			1000.00	1010.17	100	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.861	3.861	0/0	310654	19	>100:1	Target = 30.35		1000.00	944.11		
498>478	55	3.861	3.861		11509	23	34:1	26.99 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.918	3.918	0	95787	18				5000.00	4851.14	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.910	3.910	0/0	38952	20	>100:1	Target = 1.76		958.00	1003.20		
527 > 81	65	3.918	3.910		20562	24		1.89 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.516	4.516	0/0	43271	17		Target = 3.19		964.00	997.51		
627 > 80	65	4.516	4.516		13528	17	>100:1	3.19 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.926	3.926	0	633125	18	>100:1			1000.00	1027.28	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.918	3.918	0/0	639371	20	>100:1	Target = 13.71		1000.00	930.66		
513 > 169	51	3.926	3.918		49295	17	>100:1	12.97 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.078	4.078	0	791027	19	>100:1			5000.00	4781.20	100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.087	4.087	0/0	125359	35		Target = 1.62	0.12	1000.00	1029.79		M
570 > 483	58	4.087	4.087		87869	33	>100:1	1.42 (0.81-2.43)	0.22				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.235	4.235	0	733932	18	>100:1			5000.00	5073.82	100	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.245	4.245	0/0	121899	35	>100:1	Target = 1.65		1000.00	886.28		M
584 > 526	60	4.245	4.245		75465	32	>100:1	1.61 (0.82-2.48)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.235	4.235	0	665255	16	>100:1			1000.00	1029.61	100	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.235	4.235	0/0	588834	16	>100:1	Target = 13.18		1000.00	1003.57		
563 > 169	52	4.235	4.235		41387	14	>100:1	14.22 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.296	4.296	0	87073	14	>100:1			1000.00	913.68	100	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.306	4.306	0/0	103254	17	>100:1			1000.00	1099.56		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.316	4.316	0	53272	13	>100:1			1000.00	940.93	100	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.326	4.326	0/0	64237	17	>100:1	Target = 1.03		1000.00	1130.55		
512 > 219	57	4.316	4.326		51140	15	>100:1	1.25 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.462	4.462	0	111593	17	>100:1			1000.00	1051.76	100	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.480	4.480	0/0	113413	17	>100:1			1000.00	975.21		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.480	4.480	0	50190	15	>100:1			1000.00	978.22	100	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.489	4.489	0/0	56347	15	>100:1	Target = 0.93		1000.00	1029.89		
526 > 219	59	4.489	4.489		58190	16	>100:1	0.96 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.507	4.507	0	629301	16	>100:1			1000.00	980.53	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.516	4.516	0/0	663501	18	>100:1	Target = 10.57		1000.00	1034.07		
613 > 169	38	4.507	4.516		58190	15	>100:1	11.40 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.754	4.754	0/0	568694	20	>100:1	Target = 7.53		1000.00	981.54		
663 > 169	38	4.754	4.754		77790	20	>100:1	7.31 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.973	4.973	0	815001	20	>100:1			1000.00	976.86	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.973	4.973	0/0	663049	19	89:1	Target = 10.46		1000.00	1012.56		
713 > 169	42	4.973	4.973		62032	21	>100:1	10.68 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.364	5.364	0	985027	19	>100:1			1000.00	1007.48	100	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.364	5.364	0/0	592656	19	>100:1	Target = 10.26		1000.00	978.22		
813 > 269	40	5.364	5.364		55888	18	>100:1	10.60 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.733	5.733	0/0	864170	24	79:1	Target = 12.66		1000.00	968.13		
913 > 319	40	5.733	5.733		66682	23	>100:1	12.95 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.926	3.926	0	647390	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	571679	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.193	3.193	0	555340	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	470376	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.568	3.568	0	159272	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021077.d
Injection Date: 01-Jul-2021 01:23:35 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 6 Auto Sampler: 66
Sample Info: F.L ICAL 2000_SVLC-1550 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.705	0	537880	22	>100:1			1000.00	1018.89	102.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	1081978	22	>100:1			2000.00	2014.48		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	0	553557	17	>100:1			1000.00	995.06	99.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.077	0/0	1169291	17	>100:1			2000.00	2052.58		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.130	0	196495	16	>100:1			1000.00	1001.52	95.3	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.130	0/0	456540	16	>100:1	Target = 3.32		1768.00	1764.21		
298.9 > 99	44	2.130	2.130		136971	17	>100:1	3.33 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.468	2.469	0/0	351619	19	>100:1	Target = 2.99		1876.00	1948.59		
349 > 99	44	2.468	2.469		116045	20	>100:1	3.03 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.398	0	106363	19	>100:1			5000.00	4825.42	98.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.398	0/0	81570	18		Target = 1.69		1868.00	1824.33		
327 > 81	63	2.397	2.398		42326	19	>100:1	1.92 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.433	0	588335	20	>100:1			1000.00	976.76	93.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.433	0/0	1221991	19	>100:1	Target = 18.10		2000.00	2044.64		
313 > 119	49	2.442	2.433		64992	19	>100:1	18.80 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.549	2.550	0	1170707	19	>100:1			5000.00	5210.20	105	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.549	2.550	0/0	622826	19	>100:1	Target = 0.77		4000.00	3893.62		
285 > 185	66	2.549	2.550		790890	19	>100:1	0.78 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.808	2.809	0	528145	19	>100:1			1000.00	1049.64	105.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.808	2.809	0/0	1121009	18	>100:1	Target = 3.84		2000.00	1945.91		
363 > 169	47	2.808	2.809		304144	18	>100:1	3.68 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.817	2.827	0	167237	17	>100:1			1000.00	1052.70	102.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.826	2.818	1/1	340139	27	>100:1	Target = 2.95	0.17	1820.00	1906.25		
399 > 99	45	2.826	2.818		106078	25	>100:1	3.20 (1.47-4.43)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.846	0/0	1834881	19	>100:1	Target = 2.95		1884.00	1859.55		
377 > 85	45	2.845	2.846		599083	19	>100:1	3.06 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.198	3.193	1/1	298847	23	>100:1	Target = 2.85		1904.00	1794.47		
449 > 99	45	3.192	3.193		107127	23	>100:1	2.78 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.165	3.160	1	99772	21				5000.00	5063.78	99.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.165	3.167	0/-1	90979	22	>100:1	Target = 1.85		1896.00	1908.36		
427 > 81	64	3.165	3.167		47334	23	>100:1	1.92 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.192	3.187	1	525597	22	>100:1			1000.00	1009.13	101.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.192	3.193	0/-1	1023726	22	>100:1	Target = 2.73		2000.00	2069.42		
413 > 169	53	3.192	3.193		364575	25	>100:1	2.80 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.566	3.568	0	163273	19	>100:1			1000.00	1023.87	102.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.566	3.568	0/0	336750	36	>100:1	Target = 3.55	0.23	1856.00	1762.56		
499 > 99	54	3.566	3.568		94250	33	>100:1	3.57 (1.77-5.33)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.780	3.773	1/1	1063582	20	>100:1			1864.00	1826.71		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.917	3.910	1/1	249776	19	>100:1	Target = 2.84		1920.00	1891.73		
549 > 99	54	3.909	3.910		97792	18	>100:1	2.55 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.221	4.214	1/1	245280	16		Target = 2.90		1928.00	1817.32		
599 > 99	54	4.221	4.214		91962	18	>100:1	2.66 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.378	4.381	0/0	943748	18	>100:1			1884.00	1854.07		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.725	4.727	0/0	272482	20	>100:1	Target = 2.98		1936.00	1897.09		
699 > 99	54	4.725	4.727		93153	20		2.92 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.574	3.576	0	685619	20	>100:1			1000.00	1042.46	104.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.574	3.576	0/0	1373054	20	>100:1	Target = 6.23		2000.00	1988.09		
463 > 169	56	3.574	3.576		211770	20	>100:1	6.48 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.861	1	334113	19	>100:1			1000.00	1033.32	102.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.860	3.861	0/-1	648777	18	>100:1	Target = 30.35		2000.00	1927.51		
498>478	55	3.860	3.861		21020	18		30.86 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.917	3.918	0	100958	18	>100:1			5000.00	5113.03	105.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.917	3.910	1/1	74814	18	>100:1	Target = 1.76		1916.00	1828.12		
527 > 81	65	3.909	3.910		44392	18	>100:1	1.68 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.522	4.516	1/1	84887	18		Target = 3.19		1928.00	1873.77		
627 > 80	65	4.522	4.516		29998	16	>100:1	2.82 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.926	3.926	0	637567	19	>100:1			1000.00	1034.49	100.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.926	3.918	1/1	1377919	18	>100:1	Target = 13.71		2000.00	1991.70		
513 > 169	51	3.926	3.918		97181	19	>100:1	14.17 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.085	4.078	1	835268	18	>100:1			5000.00	5048.60	105.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.085	4.087	0/-1	264546	34	>100:1	Target = 1.62	0.09	2000.00	2078.24		M
570 > 483	58	4.085	4.087		201474	35	>100:1	1.31 (0.81-2.43)	0.08				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.242	4.235	1	774712	16	>100:1			5000.00	5355.74	105.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.242	4.245	0/-1	272216	36	>100:1	Target = 1.65		2000.00	1874.99		M
584 > 526	60	4.242	4.245		164773	33	>100:1	1.65 (0.82-2.48)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.242	4.235	1	680846	16	>100:1			1000.00	1053.74	102.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.242	4.235	1/0	1166478	18	>100:1	Target = 13.18		2000.00	1942.54		
563 > 169	52	4.242	4.235		82476	18	>100:1	14.14 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.302	4.296	1	96404	16	>100:1			1000.00	1011.60	110.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.313	4.306	1/0	206149	16	>100:1			2000.00	1982.80		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.313	4.316	0	56077	14	>100:1			1000.00	990.47	105.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.323	4.326	0/0	130604	16	>100:1	Target = 1.03		2000.00	2183.61		
512 > 219	57	4.323	4.326		115906	15	>100:1	1.12 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.468	4.462	1	111427	18	>100:1			1000.00	1050.20	99.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.477	4.480	0/-1	234921	17	>100:1			2000.00	2023.04		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.486	4.480	1	54133	16	>100:1			1000.00	1055.07	107.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.495	4.489	1/0	113536	15	>100:1	Target = 0.93		2000.00	1924.02		
526 > 219	59	4.495	4.489		118508	15	>100:1	0.95 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.513	4.507	1	670568	17	>100:1			1000.00	1044.83	106.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.516	0/-1	1327568	17	>100:1	Target = 10.57		2000.00	1941.69		
613 > 169	38	4.513	4.516		130559	15	>100:1	10.16 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.752	4.754	0/-1	1228798	20	>100:1	Target = 7.53		2000.00	1990.32		
663 > 169	38	4.752	4.754		166472	19	>100:1	7.38 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.971	4.973	0	848229	20	>100:1			1000.00	1016.68	104.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.978	4.973	1/1	1382549	19	>100:1	Target = 10.46		2000.00	2028.63		
713 > 169	42	4.978	4.973		128583	22	>100:1	10.75 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.368	5.364	1	998728	18	>100:1			1000.00	1021.49	101.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.368	5.364	1/0	1166166	18	>100:1	Target = 10.26		2000.00	1898.43		
813 > 269	40	5.368	5.364		116664	19	>100:1	9.99 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.737	5.733	1/0	1823026	24	>100:1	Target = 12.66		2000.00	2014.32		
913 > 319	40	5.737	5.733		140360	24	>100:1	12.98 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.926	3.926	0	691436	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.433	2.442	0	610958	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.185	3.193	0	534365	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	475559	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.566	3.568	0	157217	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021078.d
Injection Date: 01-Jul-2021 01:34:13 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 7 Auto Sampler: 67
Sample Info: F.L ICAL 5000_SVLC-1551 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.705	0	521537	21	>100:1			1000.00	987.93	99.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	2588951	22	>100:1			5000.00	4971.28		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	0	536051	18	>100:1			1000.00	963.59	96.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.077	0/0	2804258	16	>100:1			5000.00	5083.38		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.130	0	191742	16	>100:1			1000.00	977.30	93	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.130	0/0	1110529	16	>100:1	Target = 3.32		4420.00	4397.80		
298.9 > 99	44	2.130	2.130		326579	16	>100:1	3.40 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.469	2.469	0/0	807891	19	>100:1	Target = 2.99		4690.00	4588.11		
349 > 99	44	2.469	2.469		280005	19	>100:1	2.88 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.398	0	108566	16	>100:1			5000.00	4925.36	100.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.398	0/0	206809	18		Target = 1.69		4670.00	4531.48		
327 > 81	63	2.397	2.398		116143	18	>100:1	1.78 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.433	0	596733	19	>100:1			1000.00	990.71	95.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.433	0/0	2887620	19	>100:1	Target = 18.10		5000.00	4763.59		
313 > 119	49	2.442	2.433		167176	18	>100:1	17.27 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.549	2.550	0	1124506	18	>100:1			5000.00	5004.59	100.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.549	2.550	0/0	1552247	19	>100:1	Target = 0.77		10000	10103		
285 > 185	66	2.549	2.550		1980633	19	>100:1	0.78 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	506361	19	>100:1			1000.00	1006.34	101.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.809	0/0	2725031	19	>100:1	Target = 3.84		5000.00	4933.77		
363 > 169	47	2.809	2.809		762669	19	>100:1	3.57 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.827	0	159850	19	>100:1			1000.00	1006.20	98.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.818	1/1	767271	27	>100:1	Target = 2.95	0.17	4550.00	4498.76		
399 > 99	45	2.818	2.818		256572	25	>100:1	2.99 (1.47-4.43)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.846	0/0	4355155	19	>100:1	Target = 2.95		4710.00	4617.69		
377 > 85	45	2.845	2.846		1441982	20	>100:1	3.02 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.194	3.193	1/1	741098	23	>100:1	Target = 2.85		4760.00	4655.66		
449 > 99	45	3.200	3.193		248243	23	>100:1	2.98 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.167	3.160	1	95248	25	>100:1			5000.00	4834.17	95.4	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.167	3.167	1/0	210130	24	>100:1	Target = 1.85		4740.00	4697.51		
427 > 81	64	3.167	3.167		117339	21	>100:1	1.79 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.187	3.187	1	518434	23	>100:1			1000.00	995.38	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.194	3.193	1/0	2332443	23	>100:1	Target = 2.73		5000.00	4780.09		
413 > 169	53	3.194	3.193		871752	23	>100:1	2.67 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.568	3.568	1	160717	18	>100:1			1000.00	1007.84	100.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.568	3.568	1/0	860534	44	>100:1	Target = 3.55	0.27	4640.00	4575.69		M
499 > 99	54	3.568	3.568		249728	42	>100:1	3.44 (1.77-5.33)	0.07				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.781	3.773	1/0	2539409	20	>100:1			4660.00	4430.82		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.910	3.910	1/0	631108	18	>100:1	Target = 2.84		4800.00	4855.83		
549 > 99	54	3.910	3.910		230909	19		2.73 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.225	4.214	1/0	609723	18	>100:1	Target = 2.90		4820.00	4589.37		
599 > 99	54	4.215	4.214		222868	16	>100:1	2.73 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.381	4.381	1/0	2302238	18	>100:1			4710.00	4594.88		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.727	4.727	0/-1	673453	19	>100:1	Target = 2.98		4840.00	4763.32		
699 > 99	54	4.727	4.727		226232	21	>100:1	2.97 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.576	3.576	1	669163	19	>100:1			1000.00	1017.44	102.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.576	3.576	1/0	3324939	20	>100:1	Target = 6.23		5000.00	4932.67		
463 > 169	56	3.576	3.576		550049	20	>100:1	6.04 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.861	3.861	1	333175	20				1000.00	1030.42	102	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.861	3.861	1/0	1603212	19	>100:1	Target = 30.35		5000.00	4776.55		
498>478	55	3.861	3.861		46668	24	>100:1	34.35 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.910	3.918	0	95830	19	>100:1			5000.00	4853.32	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.919	3.910	1/1	197348	18	>100:1	Target = 1.76		4790.00	5080.36		
527 > 81	65	3.919	3.910		108555	19	>100:1	1.81 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.525	4.516	1/1	220132	17	>100:1	Target = 3.19		4820.00	5153.58		
627 > 80	65	4.525	4.516		66029	18	>100:1	3.33 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.927	3.926	1	592240	19	>100:1			1000.00	960.94	93.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.927	3.918	1/0	3259934	18	>100:1	Target = 13.71		5000.00	5072.67		
513 > 169	51	3.927	3.918		244827	18	>100:1	13.31 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.079	4.078	1	805033	17	>100:1			5000.00	4865.85	101.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.087	4.087	1/0	688781	36	>100:1	Target = 1.62		5000.00	5648.59		M
570 > 483	58	4.087	4.087		454417	34	>100:1	1.51 (0.81-2.43)	0.10				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.245	4.235	1	722998	17	>100:1			5000.00	4998.23	98.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.245	4.245	1/0	729666	35	>100:1	Target = 1.65		5000.00	5385.32		M
584 > 526	60	4.245	4.245		404543	32	>100:1	1.80 (0.82-2.48)	0.22				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.235	4.235	1	638408	16				1000.00	988.06	96	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.235	4.235	1/0	2803828	17	>100:1	Target = 13.18		5000.00	4979.62		
563 > 169	52	4.245	4.235		218915	16	>100:1	12.80 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.296	4.296	1	96080	15	>100:1			1000.00	1008.20	110.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.306	4.306	1/0	517123	17	>100:1			5000.00	4990.62		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.316	4.316	1	58065	14	73:1			1000.00	1025.59	109	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.316	4.326	0/-1	315892	15	>100:1	Target = 1.03		5000.00	5100.67		
512 > 219	57	4.316	4.326		289171	14	>100:1	1.09 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.462	4.462	1	106937	15	>100:1			1000.00	1007.88	95.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.480	4.480	1/0	550691	16	>100:1			5000.00	4941.44		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.489	4.480	1	58057	16	>100:1			1000.00	1131.55	115.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.489	4.489	1/0	278069	16	>100:1	Target = 0.93		5000.00	4393.75		
526 > 219	59	4.489	4.489		285751	16	>100:1	0.97 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.516	4.507	1	641386	17	>100:1			1000.00	999.36	101.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.516	4.516	1/0	3338307	19	>100:1	Target = 10.57		5000.00	5104.74		
613 > 169	38	4.516	4.516		328360	19		10.16 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.754	4.754	0/-1	3044728	19	>100:1	Target = 7.53		5000.00	5156.02		
663 > 169	38	4.754	4.754		388999	19	>100:1	7.82 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.972	4.973	0	836974	20	>100:1			1000.00	1003.19	102.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.979	4.973	1/1	3413102	19	>100:1	Target = 10.46		5000.00	5075.42		
713 > 169	42	4.979	4.973		307553	21	>100:1	11.09 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.364	5.364	0	964544	18	>100:1			1000.00	986.53	97.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.372	5.364	1/1	2950413	19	>100:1	Target = 10.26		5000.00	4973.28		
813 > 269	40	5.364	5.364		275628	19	>100:1	10.70 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.740	5.733	1/1	4391425	24	>100:1	Target = 12.66		5000.00	5024.18		
913 > 319	40	5.733	5.733		351732	24	>100:1	12.48 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.927	3.926	1	680369	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	594836	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.194	3.193	1	530755	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	470981	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.568	3.568	1	161034	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021079.d
Injection Date: 01-Jul-2021 01:44:57 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 8 Auto Sampler: 68
Sample Info: F.L ICAL 10000_SVLC-1552 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.705	1	522095	23	>100:1			1000.00	988.99	99.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	1/0	5212892	22	>100:1			10000	9999.06		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	544114	16	>100:1			1000.00	978.09	98.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.077	1/0	5667311	17	>100:1			10000	10121		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.130	1	200217	16	>100:1			1000.00	1020.49	97.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.130	1/0	2330220	16	>100:1	Target = 3.32		8840.00	8837.28		
298.9 > 99	44	2.130	2.130		677898	16	>100:1	3.43 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.469	2.469	0/-1	1687874	19	>100:1	Target = 2.99		9380.00	9179.90		
349 > 99	44	2.469	2.469		567146	19	>100:1	2.97 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	111600	18	>100:1			5000.00	5063.01	103.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	0/0	446553	18		Target = 1.69		9340.00	9518.60		
327 > 81	63	2.398	2.398		227104	18	>100:1	1.96 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.433	0	593459	18	>100:1			1000.00	985.27	94.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.433	1/1	5706473	20	>100:1	Target = 18.10		10000	9465.66		
313 > 119	49	2.433	2.433		319697	18	>100:1	17.84 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.549	2.550	0	1149190	20	>100:1			5000.00	5114.44	103.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.549	2.550	0/0	3074491	19	>100:1	Target = 0.77		20000	19580		
285 > 185	66	2.549	2.550		3945336	19	>100:1	0.77 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	521012	18	>100:1			1000.00	1035.46	104.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.809	0/0	5297743	19	>100:1	Target = 3.84		10000	9322.04		
363 > 169	47	2.809	2.809		1504416	19	>100:1	3.52 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.827	0	157219	18	>100:1			1000.00	989.64	96.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	0/0	1628879	27	>100:1	Target = 2.95	0.19	9100.00	9710.48		
399 > 99	45	2.818	2.818		549239	25	>100:1	2.96 (1.47-4.43)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.846	0/0	8921321	19	>100:1	Target = 2.95		9420.00	9617.40		
377 > 85	45	2.845	2.846		2957393	20	>100:1	3.01 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.194	3.193	1/1	1469718	23	>100:1	Target = 2.85		9520.00	9387.45		
449 > 99	45	3.194	3.193		498086	23	>100:1	2.95 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.161	3.160	1	99452	21	>100:1			5000.00	5047.54	99.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.168	3.167	1/0	400535	23	>100:1	Target = 1.85		9480.00	8622.39		
427 > 81	64	3.168	3.167		222668	23	>100:1	1.79 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.188	3.187	1	514792	24	>100:1			1000.00	988.39	99.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.188	3.193	0/-1	4976654	23	>100:1	Target = 2.73		10000	10271		
413 > 169	53	3.188	3.193		1757183	23	>100:1	2.83 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.569	3.568	1	152440	19	>100:1			1000.00	955.93	95.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.569	3.568	1/0	1639323	37	>100:1	Target = 3.55	0.28	9280.00	9190.02		
499 > 99	54	3.569	3.568		479884	34	>100:1	3.41 (1.77-5.33)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.773	1/0	5528243	20	>100:1			9320.00	10170		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.912	3.910	1/0	1251711	18	>100:1	Target = 2.84		9600.00	10154		
549 > 99	54	3.912	3.910		452642	19	>100:1	2.76 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.216	4.214	1/0	1240494	17	>100:1	Target = 2.90		9640.00	9844.16		
599 > 99	54	4.216	4.214		456337	17		2.71 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.383	4.381	1/0	4767240	18	>100:1			9420.00	10031		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.728	4.727	1/0	1376855	19	>100:1	Target = 2.98		9680.00	10267		
699 > 99	54	4.728	4.727		448193	19	>100:1	3.07 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.569	3.576	0	659888	21	>100:1			1000.00	1003.34	100.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.569	3.576	0/0	6650768	20	>100:1	Target = 6.23		10000	10005		
463 > 169	56	3.569	3.576		1094016	20	>100:1	6.07 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.861	1	314593	19				1000.00	972.95	96.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.861	1/0	3162474	19	>100:1	Target = 30.35		10000	9978.69		
498>478	55	3.863	3.861		98580	18	>100:1	32.08 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.912	3.918	0	96041	21	>100:1			5000.00	4864.01	100.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.920	3.910	1/1	375743	19	>100:1	Target = 1.76		9580.00	9651.55		
527 > 81	65	3.920	3.910		204770	21	>100:1	1.83 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.526	4.516	1/1	444015	18		Target = 3.19		9640.00	10392		
627 > 80	65	4.517	4.516		134050	19	>100:1	3.31 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.920	3.926	0	601566	19	>100:1			1000.00	976.07	95	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.928	3.918	1/1	6449106	19	>100:1	Target = 13.71		10000	9879.65		
513 > 169	51	3.928	3.918		478352	18	>100:1	13.48 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.080	4.078	1	835224	17	>100:1			5000.00	5048.34	105.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.089	4.087	1/0	1296337	35	>100:1	Target = 1.62	0.08	10000	10263		M
570 > 483	58	4.089	4.087		906009	32	>100:1	1.43 (0.81-2.43)	0.22				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.237	4.235	1	735973	17	>100:1			5000.00	5087.93	100.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.247	4.245	1/0	1350762	37	>100:1	Target = 1.65		10000	9793.58		M
584 > 526	60	4.247	4.245		853243	31	>100:1	1.58 (0.82-2.48)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.237	4.235	1	632554	17	>100:1			1000.00	979.00	95.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.237	4.235	1/0	5638812	17	>100:1	Target = 13.18		10000	10107		
563 > 169	52	4.237	4.235		417352	16	>100:1	13.51 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.296	1	99985	16	>100:1			1000.00	1049.17	114.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.308	4.306	1/0	1061407	15	>100:1			10000	9843.30		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.316	1	59231	20	>100:1			1000.00	1046.18	111.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.326	0/-1	606237	14	>100:1	Target = 1.03		10000	9596.15		
512 > 219	57	4.318	4.326		612822	16	>100:1	0.98 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.463	4.462	1	107933	15	>100:1			1000.00	1017.27	96.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.472	4.480	0/-1	1149793	16	>100:1			10000	10222		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.480	1	47966	15	>100:1			1000.00	934.88	95.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.490	4.489	1/0	567880	16	>100:1	Target = 0.93		10000	10861		
526 > 219	59	4.490	4.489		571218	16	>100:1	0.99 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.508	4.507	1	612763	17	>100:1			1000.00	954.76	97.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.517	4.516	1/0	6339238	18	>100:1	Target = 10.57		10000	10146		
613 > 169	38	4.517	4.516		606874	16	>100:1	10.44 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.755	4.754	1/0	5868298	21	>100:1	Target = 7.53		10000	10402		
663 > 169	38	4.755	4.754		773693	20	>100:1	7.58 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.973	4.973	1	853471	19	>100:1			1000.00	1022.97	104.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.973	4.973	1/0	6682978	20	>100:1	Target = 10.46		10000	9745.76		
713 > 169	42	4.973	4.973		643256	21	>100:1	10.38 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.364	5.364	1	979099	19	>100:1			1000.00	1001.42	99.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.364	5.364	1/0	5866485	19	>100:1	Target = 10.26		10000	9741.66		
813 > 269	40	5.364	5.364		563188	18	>100:1	10.41 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.740	5.733	1/0	8953598	24	>100:1	Target = 12.66		10000	10091		
913 > 319	40	5.733	5.733		715134	23	>100:1	12.52 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.920	3.926	0	679781	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.433	2.442	0	595723	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.188	3.193	0	513171	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	486867	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.561	3.568	0	155372	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021080.d
Injection Date: 01-Jul-2021 01:55:37 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 9 Auto Sampler: 69
Sample Info: F.L ICAL 15000_SVLC-1553 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.705	1	509551	22	>100:1			1000.00	965.23	96.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	1/0	7699086	22	>100:1			15000	15131		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	542298	17	>100:1			1000.00	974.82	97.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.077	1/0	8170217	16	>100:1			15000	14640		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.130	1	188121	16	>100:1			1000.00	958.84	91.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.130	1/0	3399337	17	>100:1	Target = 3.32		13260	13721		
298.9 > 99	44	2.141	2.130		971600	15	>100:1	3.49 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.469	2.469	0/-1	2540356	19	>100:1	Target = 2.99		14070	14705		
349 > 99	44	2.469	2.469		860635	18	>100:1	2.95 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	102516	18	>100:1			5000.00	4650.89	95.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	0/0	597052	18	>100:1	Target = 1.69		14010	13854		
327 > 81	63	2.398	2.398		331533	18	>100:1	1.80 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.433	1	592092	18	>100:1			1000.00	983.00	94.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.433	1/0	8553412	18	>100:1	Target = 18.10		15000	14221		
313 > 119	49	2.442	2.433		470027	19	>100:1	18.19 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.549	2.550	0	1071820	19	>100:1			5000.00	4770.11	96.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.549	2.550	0/0	4428771	19	>100:1	Target = 0.77		30000	30241		
285 > 185	66	2.549	2.550		5770466	19	>100:1	0.76 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	498459	18	>100:1			1000.00	990.64	100	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.809	0/0	7857500	18	>100:1	Target = 3.84		15000	14452		
363 > 169	47	2.809	2.809		2085941	18	>100:1	3.76 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.827	0	149517	18	>100:1			1000.00	941.16	92	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.818	1/1	2252587	27	>100:1	Target = 2.95	0.19	13650	14120		
399 > 99	45	2.827	2.818		740107	25	>100:1	3.04 (1.47-4.43)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.846	0/0	12484193	19	>100:1	Target = 2.95		14130	14152		
377 > 85	45	2.854	2.846		4478199	19	>100:1	2.78 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.201	3.193	1/1	2073552	23	>100:1	Target = 2.85		14280	13927		
449 > 99	45	3.194	3.193		693991	24	>100:1	2.98 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.161	3.160	1	92647	20	>100:1			5000.00	4702.16	92.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.168	3.167	1/0	584298	23	>100:1	Target = 1.85		14220	13534		
427 > 81	64	3.168	3.167		320473	23	>100:1	1.82 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.188	3.187	1	472187	24	>100:1			1000.00	906.59	91.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.194	3.193	1/0	6881782	23	>100:1	Target = 2.73		15000	15485		
413 > 169	53	3.194	3.193		2578122	22	>100:1	2.66 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.569	3.568	1	158266	19	>100:1			1000.00	992.47	99.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.569	3.568	1/0	2309071	37	>100:1	Target = 3.55	0.28	13920	12468		
499 > 99	54	3.569	3.568		645001	32	>100:1	3.57 (1.77-5.33)	0.09				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.773	1/0	7643797	20	>100:1			13980	13544		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.912	3.910	1/0	1725823	19	>100:1	Target = 2.84		14400	13484		
549 > 99	54	3.912	3.910		668163	19	>100:1	2.58 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.217	4.214	1/0	1720268	17	>100:1	Target = 2.90		14460	13149		
599 > 99	54	4.217	4.214		637990	17	>100:1	2.69 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.383	4.381	1/0	6955233	17	>100:1			14130	14096		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.728	4.727	1/0	2050982	19	>100:1	Target = 2.98		14520	14731		
699 > 99	54	4.728	4.727		650243	20	>100:1	3.15 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.577	3.576	1	632134	20	>100:1			1000.00	961.14	96.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.577	3.576	1/0	9478712	20	>100:1	Target = 6.23		15000	14886		
463 > 169	56	3.577	3.576		1531923	20	>100:1	6.18 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.861	1	318141	20	>100:1			1000.00	983.92	97.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.861	1/0	4896703	19	>100:1	Target = 30.35		15000	15278		
498>478	55	3.863	3.861		157902	20	>100:1	31.01 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.912	3.918	0	103649	26				5000.00	5249.32	108.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.912	3.910	1/1	557100	19	>100:1	Target = 1.76		14370	13260		
527 > 81	65	3.912	3.910		288681	19		1.92 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.527	4.516	1/1	653147	16		Target = 3.19		14460	14172		
627 > 80	65	4.527	4.516		199671	17	>100:1	3.27 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.921	3.926	0	588794	19	>100:1			1000.00	955.35	93	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.921	3.918	1/1	9593717	19	>100:1	Target = 13.71		15000	15016		
513 > 169	51	3.929	3.918		752879	20	>100:1	12.74 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.081	4.078	1	839712	17	>100:1			5000.00	5075.46	106.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.090	4.087	1/0	1866813	35	>100:1	Target = 1.62	0.09	15000	14710		M
570 > 483	58	4.090	4.087		1377853	34	>100:1	1.35 (0.81-2.43)	0.14				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.237	4.235	1	661686	17	>100:1			5000.00	4574.37	90.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.248	4.245	1/0	1917377	36	>100:1	Target = 1.65		15000	15463		M
584 > 526	60	4.248	4.245		1199616	35	>100:1	1.59 (0.82-2.48)	0.07				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.237	4.235	1	618472	15	>100:1			1000.00	957.21	93	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.237	4.235	1/0	7932172	17	>100:1	Target = 13.18		15000	14542		
563 > 169	52	4.237	4.235		574989	17	>100:1	13.79 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.296	1	100004	15	>100:1			1000.00	1049.37	114.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.308	4.306	1/0	1500911	16	>100:1			15000	13917		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.316	1	63059	15	>100:1			1000.00	1113.80	118.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.326	0/-1	915576	14	>100:1	Target = 1.03		15000	13613		
512 > 219	57	4.318	4.326		882459	15	>100:1	1.03 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.464	4.462	1	103931	17	>100:1			1000.00	979.55	93.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.473	4.480	0/-1	1700502	17	>100:1			15000	15700		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.482	4.480	1	48292	17	>100:1			1000.00	941.23	96.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.491	4.489	1/0	812408	16	>100:1	Target = 0.93		15000	15433		
526 > 219	59	4.491	4.489		874208	15	>100:1	0.92 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.509	4.507	1	637755	18	>100:1			1000.00	993.71	101.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.509	4.516	0/-1	9016408	16	>100:1	Target = 10.57		15000	13866		
613 > 169	38	4.509	4.516		892575	18	>100:1	10.10 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.755	4.754	1/0	8449596	21	>100:1	Target = 7.53		15000	14390		
663 > 169	38	4.755	4.754		1138151	20	>100:1	7.42 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.976	4.973	1	831473	20	>100:1			1000.00	996.60	102	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.976	4.973	1/0	9284593	22	>100:1	Target = 10.46		15000	13898		
713 > 169	42	4.976	4.973		929010	20	>100:1	9.99 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.367	5.364	1	985946	18	>100:1			1000.00	1008.42	100.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.367	5.364	1/0	8459100	19	>100:1	Target = 10.26		15000	13949		
813 > 269	40	5.367	5.364		812580	17	>100:1	10.41 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.736	5.733	1/0	13173460	24	>100:1	Target = 12.66		15000	14744		
913 > 319	40	5.736	5.733		1066420	23	>100:1	12.35 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.921	3.926	0	634201	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	572088	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.194	3.193	1	494666	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	463088	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.569	3.568	1	150094	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021081.d
Injection Date: 01-Jul-2021 02:06:17 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 10 Auto Sampler: 70
Sample Info: F.L ICAL 20000_SVLC-1554 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.705	1	501612	22	>100:1			1000.00	950.19	95.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.711	1/0	9827296	22	>100:1			20000	19620		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	525903	16	>100:1			1000.00	945.35	94.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.077	1/0	10929377	17	>100:1			20000	20194		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.130	1	183417	18	>100:1			1000.00	934.86	88.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.130	1/0	4325223	15	>100:1	Target = 3.32		17680	17906		
298.9 > 99	44	2.141	2.130		1299988	17	>100:1	3.32 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.469	2.469	1/0	3387724	18	>100:1	Target = 2.99		18760	20113		
349 > 99	44	2.469	2.469		1102415	18	>100:1	3.07 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	1	105050	18	>100:1			5000.00	4765.85	97.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.398	1/0	808615	18		Target = 1.69		18680	18311		
327 > 81	63	2.407	2.398		445206	18	>100:1	1.81 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.433	1	581529	19	>100:1			1000.00	965.46	92.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.433	1/0	11509817	19	>100:1	Target = 18.10		20000	19484		
313 > 119	49	2.442	2.433		629526	19	>100:1	18.28 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.550	1	1044735	19	>100:1			5000.00	4649.57	93.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.550	1/0	5657194	19	>100:1	Target = 0.77		40000	39631		
285 > 185	66	2.558	2.550		7427006	19	>100:1	0.76 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	479276	19	>100:1			1000.00	952.52	96.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.809	0/0	10303126	20	>100:1	Target = 3.84		20000	19708		
363 > 169	47	2.809	2.809		2817486	20	>100:1	3.65 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.827	0	150849	18	>100:1			1000.00	949.54	92.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.818	1/1	3000161	27	>100:1	Target = 2.95	0.20	18200	18641		
399 > 99	45	2.827	2.818		1002743	27	>100:1	2.99 (1.47-4.43)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.854	2.846	1/1	16058468	19	>100:1	Target = 2.95		18840	18042		
377 > 85	45	2.854	2.846		5771902	19	>100:1	2.78 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.201	3.193	1/1	2627518	23	>100:1	Target = 2.85		19040	17491		
449 > 99	45	3.201	3.193		893887	24	>100:1	2.93 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.168	3.160	1	86620	28				5000.00	4396.27	86.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.168	3.167	1/0	761594	23	>100:1	Target = 1.85		18960	18891		
427 > 81	64	3.168	3.167		410909	22	>100:1	1.85 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.194	3.187	1	468813	23	>100:1			1000.00	900.11	90.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.194	3.193	1/0	9116756	23	>100:1	Target = 2.73		20000	20661		
413 > 169	53	3.194	3.193		3278097	23	>100:1	2.78 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.569	3.568	1	149322	21	>100:1			1000.00	936.38	93.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.569	3.568	1/0	3316419	42	>100:1	Target = 3.55	0.29	18560	18980		M
499 > 99	54	3.569	3.568		974307	41	>100:1	3.40 (1.77-5.33)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.783	3.773	1/0	10348797	20	>100:1			18640	19435		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.912	3.910	1/0	2284410	19	>100:1	Target = 2.84		19200	18918		
549 > 99	54	3.912	3.910		829371	19	>100:1	2.75 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.217	4.214	1/0	2279174	15	>100:1	Target = 2.90		19280	18464		
599 > 99	54	4.217	4.214		855194	17	>100:1	2.66 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.376	4.381	0/-1	8702893	17	>100:1			18840	18695		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.728	4.727	1/0	2600629	19	>100:1	Target = 2.98		19360	19798		
699 > 99	54	4.728	4.727		859752	19	>100:1	3.02 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.577	3.576	1	617340	19	>100:1			1000.00	938.65	94.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.577	3.576	1/0	12570367	20	>100:1	Target = 6.23		20000	20214		
463 > 169	56	3.577	3.576		2031386	20	>100:1	6.18 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.861	1	303598	19	>100:1			1000.00	938.94	92.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.861	1/0	6674613	19	>100:1	Target = 30.35		20000	21823		
498>478	55	3.863	3.861		205831	20		32.42 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.921	3.918	1	91043	21	>100:1			5000.00	4610.88	95	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.921	3.910	1/0	715765	18	>100:1	Target = 1.76		19160	19395		
527 > 81	65	3.921	3.910		392600	21		1.82 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.518	4.516	1/0	814982	17	>100:1	Target = 3.19		19280	20141		
627 > 80	65	4.518	4.516		250183	16	>100:1	3.25 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.921	3.926	0	604191	19	>100:1			1000.00	980.33	95.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.929	3.918	1/1	11907205	19	>100:1	Target = 13.71		20000	18162		
513 > 169	51	3.921	3.918		915345	18	>100:1	13.00 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.081	4.078	1	857737	18	>100:1			5000.00	5184.41	108.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.081	4.087	0/-1	2481186	35	>100:1	Target = 1.62	0.10	20000	19146		M
570 > 483	58	4.081	4.087		1846906	34	>100:1	1.34 (0.81-2.43)	0.14				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.237	4.235	1	621352	16	>100:1			5000.00	4295.53	84.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.247	4.245	1/0	2404192	36	>100:1	Target = 1.65	0.07	20000	20647		M
584 > 526	60	4.247	4.245		1551765	31	>100:1	1.54 (0.82-2.48)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.237	4.235	1	571102	17	>100:1			1000.00	883.89	85.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.237	4.235	1/0	10644739	17	>100:1	Target = 13.18		20000	21133		
563 > 169	52	4.237	4.235		765157	16	>100:1	13.91 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.296	1	97912	15	>100:1			1000.00	1027.42	112.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.308	4.306	1/0	1978562	15	>100:1			20000	18737		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.316	1	55939	15	>100:1			1000.00	988.04	105	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.326	0/-1	1160986	14	>100:1	Target = 1.03		20000	19459		
512 > 219	57	4.318	4.326		1181516	15	>100:1	0.98 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.464	4.462	1	105872	15	>100:1			1000.00	997.84	94.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.473	4.480	0/-1	2294661	17	>100:1			20000	20797		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.482	4.480	1	47825	15	>100:1			1000.00	932.13	95.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.491	4.489	1/0	1094123	15	>100:1	Target = 0.93		20000	20987		
526 > 219	59	4.491	4.489		1131124	15	>100:1	0.96 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.509	4.507	1	615641	17	>100:1			1000.00	959.25	97.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.509	4.516	0/-1	11678130	18	>100:1	Target = 10.57		20000	18604		
613 > 169	38	4.509	4.516		1280675	16	>100:1	9.11 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.755	4.754	1/0	10585278	21	>100:1	Target = 7.53		20000	18675		
663 > 169	38	4.755	4.754		1424513	20	>100:1	7.43 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.974	4.973	1	805081	19	>100:1			1000.00	964.97	98.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.974	4.973	1/0	12504779	21	>100:1	Target = 10.46		20000	19332		
713 > 169	42	4.974	4.973		1220949	21	>100:1	10.24 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.364	5.364	1	937847	18	>100:1			1000.00	959.22	95.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.364	5.364	1/0	10723036	19	>100:1	Target = 10.26		20000	18589		
813 > 269	40	5.364	5.364		1062857	19	>100:1	10.08 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.740	5.733	1/0	17200983	24	>100:1	Target = 12.66		20000	20240		
913 > 319	40	5.740	5.733		1428639	24	>100:1	12.04 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.929	3.926	1	654837	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	1	569176	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.194	3.193	1	501544	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	1	456801	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.569	3.568	1	154819	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021082.d		
Injection Date:	01-Jul-2021 02:16:58	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	71
Lab Sample ID:	537.1 IBLK C	Lab Prep. Batch:	
Sample Info:	537.1 IBLK C	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Reagent:	Istds	Conc. Level: Smp	Vol. Added: 0.0100 ml
Reagent:	Surrogates	Conc. Level: Smp	Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.705	1	562805	22	>100:1			1001.00	1066.10	107	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/-1	3173	16	1.2:1			5.6517	5.6517		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	0	582631	18	>100:1			1001.00	1047.32	105.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.077		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.130	0	204266	15	>100:1			1001.00	1041.13	99.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.130		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.469		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.371	2.398	-1	195	14	1.9:1			5005.00	8.8467	0.2*	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.398		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.433	0	645270	18	>100:1			1001.00	1071.29	102.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.433		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.549	2.550	0	1148765	19	>100:1			5005.00	5112.55	103.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.550		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	571598	19	>100:1			1001.00	1136.00	114.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.809		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.827	0	172730	20	>100:1			1001.00	1087.28	106.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.818		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.818	2.846	-1/-1	890	11	0.915:1	Target = 2.94		0.87416	0.87416		
377 > 85	45	2.818	2.846		490	12	4.2:1	1.81 (1.47-4.41)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.193		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													U
429 > 81			3.160		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													a
427 > 407	64	3.185	3.167	2	1405	23	6.9:1	Target = 1.91		0	0		
427 > 81	64	3.159	3.167		699	13	13:1	2.01 (0.95-2.87)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.192	3.187	1	572458	22	>100:1			1001.00	1099.10	110.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.193		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.575	3.568	1	164989	20	>100:1			1001.00	1034.63	103.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.591	3.568	2/1	574	20	2.3:1	Target = 3.70	0.48	2.9761	2.9761		
499 > 99	54	3.575	3.568		338	15	6.8:1	1.69 (1.85-5.55)					
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.765	3.773	0/-1	1287	17	4.7:1			2.1896	2.1896		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.910		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.233	4.214	2/1	167	12	1.4:1	Target = 2.56		1.2257	1.2257		
599 > 99	54	4.223	4.214		255	15		0.65 (1.28-3.84)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.363	4.381	-1/-2	769	12	2.6:1			1.4965	1.4965		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.705	4.727	-1/-2	500	11	8.3:1	Target = 3.15		3.4484	3.4484		
699 > 99	54	4.691	4.727		183	11		2.73 (1.57-4.73)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.575	3.576	0	665897	21	>100:1			1001.00	1012.48	101.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.576		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.751	3.861	-6	108	13				1001.00	0.33401		
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.861		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.918	3.918	0	67	13				5005.00	3.3932	0.1*	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.910		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.516		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.926	3.926	0	655137	19	>100:1			1001.00	1062.99	103.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.918		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.085	4.078	1	929840	18	>100:1			5005.00	5620.22	117.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.087		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.243	4.235	1	817906	16	>100:1			5005.00	5654.35	111.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.243	4.245	0/-1	1194	56		Target = 1.61	0.12	7.7976	7.7976		
584 > 526	60	4.233	4.245		1194	17	11:1	1.00 (0.80-2.42)					
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.243	4.235	1	656264	17	>100:1			1001.00	1015.70	98.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.243	4.235	1/0	2874	12	7.4:1	Target = 14.22		4.9703	4.9703		
563 > 169	52	4.253	4.235		511	17	6.0:1	5.62 (7.11-21.34)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.174	4.296	-7	518	15	2.9:1			1001.00	5.4355	0.6*	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.304	4.306	0/7	1071	16	6.8:1			1919.06	1919.06		
D 57 d3-MeFOSA CAS: SESI-0109													U
515 > 169			4.316		ND								
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.314	4.326	0	790	17		Target = 1.25		0	0		
512 > 219	57	4.314	4.326		509	15	3.0:1	1.55 (0.62-1.88)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.263	4.462	-11	265	11	0.963:1			1001.00	2.4976	0.2*	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.487	4.480	1/12	1379	22	6.0:1			4998.34	4998.34		
D 59 d5-EtFOSA CAS: SESI-0108													U
531 > 169			4.480		ND								
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.489		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.514	4.507	1	711787	18	>100:1			1001.00	1109.06	113.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.514	4.516	0/-1	2882	20	3.3:1	Target = 11.40		3.9751	3.9751		
613 > 169	38	4.514	4.516		221	12	3.7:1	13.04 (5.70-17.10)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.754		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.978	4.973	1	851504	19	>100:1			1001.00	1020.61	104.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.973		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.369	5.364	1	4684	17	62:1			1001.00	4.7908	0.5*	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.369	5.364	1/0	10426	16	19:1	Target = 10.60		3622.57	3622.57		
813 > 269	40	5.360	5.364		1196	18	26:1	8.71 (5.30-15.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.744	5.733	1/0	26329	24	23:1	Target = 12.95		6209.17	6209.17		
913 > 319	40	5.737	5.733		1627	20	15:1	16.18 (6.47-19.43)					
*** 37 13C2_PFDA**													
515 > 470		3.926	3.926	0	780908	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	617313	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.192	3.193	0	616436	23	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	544274	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.567	3.568	0	167440	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021083.d
Injection Date: 01-Jul-2021 02:27:28 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 72
Sample Info: F.L. ICV 500_SVLC-1555 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	526195	549887			104.5	50 - 150
8 PFBA			500.00	508.55	101.7	70 - 130
D 50 13C5_PFPeA	554204	554268			100	50 - 150
21 PFPeA			500.00	527.82	105.6	70 - 130
7 PFBS			442.50	461.88	104.4	70 - 130
D 44 13C3_PFBS	206203	198947			96.5	50 - 150
1 4:2 FTS			467.50	448.46	95.9	70 - 130
D 63 13C2_4:2 FTS_2	107786	112003			103.9	50 - 150
D 49 13C5_PFHxA	627539	618347			98.5	50 - 150
15 PFHxA			500.00	497.97	99.6	70 - 130
22 PFPeS			470.00	512.04	108.9	70 - 130
28 GenX			2500.00	2526.94	101.1	70 - 130
D 66 13C3_GenX	1114703	1158740			104	50 - 150
D 47 13C4_PFHpA	498643	525901			105.5	50 - 150
13 PFHpA			500.00	497.37	99.5	70 - 130
14 PFHxS			456.00	447.61	98.2	70 - 130
D 45 13C3_PFHxS	162520	165736			102	50 - 150
29 ADONA			2355.00	2319.91	98.5	70 - 130
D 64 13C2_6:2 FTS_2	99835	95755			95.9	50 - 150
2 6:2 FTS			475.00	511.72	107.7	70 - 130
D 53 13C8_PFOA	518596	538073			103.8	50 - 150
20 PFOA			500.00	542.75	108.5	70 - 130
12 PFHpS			475.00	454.04	95.6	70 - 130
18 PFOS			462.75	457.61	98.9	70 - 130
D 54 13C8_PFOS	159637	158090			99	50 - 150
17 PFNA			500.00	532.22	106.4	70 - 130
D 56 13C9_PFNA	653988	656098			100.3	50 - 150
30 9Cl-PF3ONS			2330.00	2305.43	98.9	70 - 130
D 55 13C8_PFOSA	326627	322338			98.7	50 - 150
19 PFOSA			500.00	491.87	98.4	70 - 130
16 PFNS			480.00	510.97	106.5	70 - 130
3 8:2 FTS			480.00	540.33	112.6	70 - 130
10 PFDA			500.00	523.06	104.6	70 - 130
D 65 13C2_8:2 FTS_2	95787	99240			103.6	50 - 150
D 51 13C6_PFDA	633125	636720			100.6	50 - 150
D 58 d3-MeFOSAA	791027	897465			113.5	50 - 150

Report Date: 02-Jul-2021 12:42:13 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\063021-DOD+ICAL.b\063021083.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	545.65	109.1	70 - 130
9 PFDS			482.50	483.22	100.1	70 - 130
25 PFUdA			500.00	486.71	97.3	70 - 130
D 60 d5-EtFOSAA	733932	736903			100.4	50 - 150
D 52 13C7_PFUdA	665255	704502			105.9	50 - 150
5 N-EtFOSAA			500.00	572.10	114.4	70 - 130
D 61 d7-MeFOSE	87073	93240			107.1	50 - 150
D 57 d3-MeFOSA	53272	57721			108.4	50 - 150
31 11Cl-PF3OUDS			2355.00	2294.57	97.4	70 - 130
D 62 d9-EtFOSE	111593	111570			100	50 - 150
D 59 d5-EtFOSA	50190	52176			104	50 - 150
D 38 13C2_PFDoA	629301	681802			108.3	50 - 150
4 10:2 FTS			2410.00	2988.06	124	70 - 130
11 PFDoA			500.00	511.32	102.3	70 - 130
24 PFTrDA			500.00	541.64	108.3	70 - 130
23 PFTeDA			500.00	570.22	114	70 - 130
D 42 13C2_PFTeDA	815001	847368			104	50 - 150
D 40 13C2_PFHxDA	985027	1010381			102.6	50 - 150

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021083.d
Injection Date: 01-Jul-2021 02:27:28 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 72
Sample Info: F.L. ICV 500_SVLC-1555 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.705	1	549887	23	>100:1			1000.00	1041.63	104.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/-1	279237	23	>100:1			500.00	508.55		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.076	2.077	0	554268	17	>100:1			1000.00	996.34	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.087	2.077	1/1	301067	16	>100:1			500.00	527.82		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.130	1	198947	15	>100:1			1000.00	1014.02	96.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.129	2.130	0/-1	121017	15	>100:1	Target = 3.32		442.50	461.88		
298.9 > 99	44	2.140	2.130		34649	15	>100:1	3.49 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.469	1/0	93550	19	>100:1	Target = 2.99		470.00	512.04		
349 > 99	44	2.468	2.469		32033	22	>100:1	2.92 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.398	1	112003	18	>100:1			5000.00	5081.29	103.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.398	0/-1	21115	19	>100:1	Target = 1.69		467.50	448.46		
327 > 81	63	2.406	2.398		13310	20	81:1	1.58 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.433	1	618347	19	>100:1			1000.00	1026.59	98.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.433	1/0	312799	19	>100:1	Target = 18.10		500.00	497.97		
313 > 119	49	2.442	2.433		18219	17	>100:1	17.16 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.550	1	1158740	19	>100:1			5000.00	5156.94	104	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.550	1/0	400079	19	>100:1	Target = 0.77		2500.00	2526.94		
285 > 185	66	2.558	2.550		501321	19	>100:1	0.79 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.808	2.809	0	525901	19	>100:1			1000.00	1045.18	105.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.817	2.809	1/1	285311	20	>100:1	Target = 3.84		500.00	497.37		
363 > 169	47	2.817	2.809		74993	18	>100:1	3.80 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.827	0	165736	20	>100:1			1000.00	1043.25	102	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.818	1/1	79151	26	>100:1	Target = 2.95	0.17	456.00	447.61		
399 > 99	45	2.827	2.818		29457	26	>100:1	2.68 (1.47-4.43)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.854	2.846	1/1	2268585	19	>100:1	Target = 2.95		2355.00	2319.91		
377 > 85	45	2.854	2.846		755622	19	>100:1	3.00 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.199	3.193	1/1	74937	22	>100:1	Target = 2.85		475.00	454.04		
449 > 99	45	3.199	3.193		28881	28	>100:1	2.59 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.172	3.160	1	95755	20	>100:1			5000.00	4859.90	95.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.172	3.167	1/0	25258	22	>100:1	Target = 1.85		475.00	511.72		
427 > 81	64	3.172	3.167		13529	20	>100:1	1.86 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.192	3.187	1	538073	22	>100:1			1000.00	1033.08	103.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.199	3.193	1/0	274866	22	>100:1	Target = 2.73		500.00	542.75		
413 > 169	53	3.199	3.193		99940	24	>100:1	2.75 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.566	3.568	0	158090	17	>100:1			1000.00	991.36	99	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.566	3.568	0/0	84655	37	>100:1	Target = 3.55	0.27	462.75	457.61		
499 > 99	54	3.566	3.568		23031	35	>100:1	3.67 (1.77-5.33)	0.06				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.780	3.773	1/1	1299698	21	>100:1			2330.00	2305.43		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.917	3.910	1/1	65325	17	>100:1	Target = 2.84		480.00	510.97		
549 > 99	54	3.909	3.910		27153	16	>100:1	2.40 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.221	4.214	1/1	63149	20	>100:1	Target = 2.90		482.50	483.22		
599 > 99	54	4.221	4.214		25875	15	>100:1	2.44 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.378	4.381	0/0	1130889	17	>100:1			2355.00	2294.57		
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.574	3.576	0	656098	20	>100:1			1000.00	997.58	100.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.574	3.576	0/0	351746	21	>100:1	Target = 6.23		500.00	532.22		
463 > 169	56	3.574	3.576		54855	20	>100:1	6.41 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.861	1	322338	21				1000.00	996.90	98.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.868	3.861	1/0	159723	18	>100:1	Target = 30.35		500.00	491.87		
498>478	55	3.876	3.861		4831	21		33.06 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.909	3.918	0	99240	19				5000.00	5026.02	103.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.917	3.910	1/1	21736	22	>100:1	Target = 1.76		480.00	540.33		
527 > 81	65	3.917	3.910		10989	23		1.97 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.522	4.516	1/1	132543	18		Target = 3.19		2410.00	2988.06		
627 > 80	65	4.522	4.516		39387	17	>100:1	3.36 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.926	3.926	0	636720	19	>100:1			1000.00	1033.11	100.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.926	3.918	1/1	361392	18	>100:1	Target = 13.71		500.00	523.06		
513 > 169	51	3.926	3.918		25609	16	>100:1	14.11 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.076	4.078	0	897465	18	>100:1			5000.00	5424.54	113.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.093	4.087	1/1	76648	19	>100:1	Target = 1.62		500.00	545.65		
570 > 483	58	4.085	4.087		44715	17	>100:1	1.71 (0.81-2.43)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.242	4.235	1	736903	16	>100:1			5000.00	5094.36	100.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.242	4.245	0/-1	79006	15	>100:1	Target = 1.65		500.00	572.10		
584 > 526	60	4.242	4.245		49744	16	>100:1	1.58 (0.82-2.48)					
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.232	4.235	0	704502	16	>100:1			1000.00	1090.35	105.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.242	4.235	1/1	302417	16	>100:1	Target = 13.18		500.00	486.71		
563 > 169	52	4.242	4.235		20790	15	90:1	14.54 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.296	0	93240	15	>100:1			1000.00	978.40	107.1	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.313	4.316	0	57721	14	>100:1			1000.00	1019.51	108.4	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.468	4.462	1	111570	18	>100:1			1000.00	1051.55	100	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.486	4.480	1	52176	18	>100:1			1000.00	1016.93	104	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.513	4.507	1	681802	17	>100:1			1000.00	1062.34	108.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.516	0/-1	355457	17	>100:1	Target = 10.57		500.00	511.32		
613 > 169	38	4.504	4.516		33808	16	>100:1	10.51 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.752	4.754	0/-1	340001	20	>100:1	Target = 7.53		500.00	541.64		
663 > 169	38	4.752	4.754		42609	19	>100:1	7.97 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.971	4.973	0	847368	19	>100:1			1000.00	1015.65	104	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.971	4.973	0/0	388225	19	51:1	Target = 10.46		500.00	570.22		
713 > 169	42	4.971	4.973		34684	20	>100:1	11.19 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.360	5.364	0	1010381	18	>100:1			1000.00	1033.41	102.6	
*** 37 13C2_PFDA**													
515 > 470		3.917	3.926	0	701405	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	590022	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.192	3.193	0	542538	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	491200	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.566	3.568	0	161337	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\063021-DOD+ICAL.b\063021084.d
Injection Date: 01-Jul-2021 02:37:58 Injection Vol: 10.0 uL
Sample Type: CheckStd Auto Sampler: 73
Sample Info: ISOMER CHECK_SVLC-1562 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: IsomerCheck Conc. Level: Smp Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.705	1	623410	22	>100:1			1000.00	1180.91	118.5	
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	0	614327	17	>100:1			1000.00	1104.30	110.8	
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.130	0	211569	17	>100:1			1000.00	1078.35	102.6	
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.398	0	124670	18	>100:1			5000.00	5655.96	115.7	
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.433	0	683461	18	>100:1			1000.00	1134.69	108.9	
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.549	2.550	0	1295955	19	>100:1			5000.00	5767.62	116.3	
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.808	2.809	0	590328	18	>100:1			1000.00	1173.22	118.4	
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.827	0	194386	19	>100:1			1000.00	1223.60	119.6	
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.165	3.160	1	115875	22	>100:1			5000.00	5881.06	116.1	
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.192	3.187	1	589533	22	>100:1			1000.00	1131.89	113.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.192	3.193	0/-1	7141312	34	>100:1	Target = 3.11	0.17	10000	12870		
413 > 169	53	3.192	3.193		2761202	36	>100:1	2.58 (1.55-4.67)	0.24				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.567	3.568	0	177466	22	>100:1			1000.00	1112.87	111.2	
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.575	3.576	0	770943	20	>100:1			1000.00	1172.19	117.9	
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.861	1	385268	18	>100:1			1000.00	1191.53	118	
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.918	3.918	0	114076	25	>100:1			5000.00	5777.39	119.1	
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.926	3.926	0	768942	19	>100:1			1000.00	1247.65	121.5	
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.085	4.078	1	931183	18	>100:1			5000.00	5628.34	117.7	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.085	4.087	0/-1	2111091	34	>100:1	Target = 1.42	0.09	10000	15001		M
570 > 483	58	4.085	4.087		1583019	33	>100:1	1.33 (0.71-2.13)	0.24				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.243	4.235	1	867333	16	>100:1			5000.00	5996.05	118.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.243	4.245	0/-1	2182896	37	>100:1	Target = 1.61		10000	13430		M
584 > 526	60	4.243	4.245		1363175	32	>100:1	1.60 (0.80-2.42)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.243	4.235	1	711246	16	>100:1			1000.00	1100.79	106.9	
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.294	4.296	0	109434	14	>100:1			1000.00	1148.33	125.7	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.314	4.316	0	60204	12	>100:1			1000.00	1063.37	113	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.460	4.462	0	131553	17	>100:1			1000.00	1239.89	117.9	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.478	4.480	0	56231	15	>100:1			1000.00	1095.96	112	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.514	4.507	1	761435	17	>100:1			1000.00	1186.41	121	
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.972	4.973	0	1029001	19	>100:1			1000.00	1233.36	126.3	
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.369	5.364	1	1094168	18	>100:1			1000.00	1119.11	111.1	
*** 37 13C2_PFDA**													
515 > 470		3.926	3.926	0	781307	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	665643	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.192	3.193	0	599900	23	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	561063	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.575	3.568	1	191488	22	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Report Date: 25-Jul-2021 09:48:01 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.321	3.288	4.138	4.137	3.727	3.671	3.337	3.480	3.690	3.810	3.659	2.808-4.645	0.30603	1.863
1 4:2 FTS	0.853	1.412	1.669	1.502	1.395	1.625	1.846	1.498	1.511	1.755	1.506	0.620-2.169	0.25803	0.697
15 PFHxA	18.557	15.829	15.562	14.692	15.325	17.499	16.990	17.248	16.985	15.608	16.429	11.883-18.766	1.14721	7.662
22 PFPeS	3.746	3.334	2.960	3.382	3.079	3.193	3.233	3.322	3.504	3.320	3.307	2.441-3.716	0.21265	1.539
28 GenX	0.871	0.833	0.776	0.772	0.799	0.732	0.728	0.806	0.738	0.726	0.778	0.656-0.941	0.04748	0.399
13 PFHpA	3.068	2.922	2.751	3.071	3.398	3.373	3.442	2.961	3.375	3.126	3.148	2.699-4.096	0.23299	1.699
14 PFHxS	2.926	3.405	3.429	3.261	3.461	3.408	3.429	3.352	3.276	3.261	3.320	2.815-4.106	0.21512	1.730
29 ADONA	2.310	2.436	3.294	2.588	2.531	2.494	2.531	2.426	2.375	2.432	2.541	1.429-3.632	0.36718	1.265
2 6:2 FTS	1.155	1.375	1.414	1.626	1.416	1.669	1.457	1.551	1.691	1.541	1.489	0.953-1.878	0.15432	0.708
20 PFOA	2.503	2.945	2.501	3.127	2.626	2.757	2.876	2.849	2.742	2.665	2.759	2.025-3.226	0.20024	1.313
12 PFHpS	3.678	4.415	3.526	3.215	3.738	3.239	3.394	3.365	3.669	3.502	3.574	2.716-4.759	0.34054	1.869
18 PFOS	3.197	4.346	4.230	3.674	3.760	3.686	3.838	4.082	4.322	3.923	3.905	2.749-4.770	0.33686	1.880
17 PFNA	5.255	5.083	4.792	4.705	4.821	5.027	4.843	4.728	4.491	4.697	4.844	4.184-5.457	0.21216	2.410
19 PFOSA	75.390	24.756	40.572	39.362	43.922	41.633	39.152	37.527	39.958	41.159	42.343	6.076-81.767	12.61508	21.961
16 PFNS	4.131	2.605	3.992	3.093	3.220	3.525	4.244	3.245	3.351	3.283	3.468	1.639-4.800	0.52682	1.610
3 8:2 FTS	Disabled	1.087	0.920	1.278	1.337	1.654	1.581	1.444	1.511	1.542	1.372	0.628-2.045	0.23632	0.668
10 PFDA	11.555	17.454	9.696	11.433	9.469	10.411	10.327	10.800	10.458	10.081	11.168	2.522-16.415	2.31557	4.734
6 N-MeFOSAA	1.058	1.409	1.233	1.486	1.424	1.493	1.504	1.465	1.427	1.446	1.394	0.993-1.854	0.14353	0.712
9 PFDS	3.649	3.205	3.762	3.092	3.783	3.312	3.163	3.349	3.136	3.215	3.366	2.927-4.638	0.28525	1.891
5 N-EtFOSAA	1.821	1.842	1.797	1.581	2.065	1.724	1.809	1.746	1.778	1.825	1.798	1.716-2.413	0.11610	1.032
25 PFUdA	13.785	9.546	10.529	13.385	10.254	9.559	10.088	9.803	10.638	10.369	10.795	5.713-14.794	1.51356	5.127
26 MeFOSA	0.699	1.058	1.195	0.934	1.057	1.068	1.136	1.088	1.103	1.139	1.047	0.625-1.488	0.14399	0.528
11 PFDoA	8.519	8.778	7.816	8.044	8.015	7.418	7.617	7.255	7.351	7.435	7.824	6.105-9.924	0.63665	4.007
4 10:2 FTS	1.910	1.850	2.054	2.316	2.453	2.276	2.364	2.328	2.414	2.379	2.234	1.773-3.132	0.22648	1.226
27 EtFOSA	1.304	0.917	0.918	1.015	1.068	1.020	1.100	1.038	1.107	1.132	1.061	0.730-1.405	0.11265	0.534
34 PFDOS	4.352	3.740	3.762	2.886	3.469	3.341	3.443	3.385	3.436	3.335	3.514	2.303-4.634	0.38855	1.734
24 PFTrDA	3.219	3.157	3.682	3.226	3.366	3.387	3.271	3.369	3.375	3.542	3.359	2.908-3.823	0.15244	1.683
23 PFTeDA	8.965	10.866	10.033	9.090	9.195	9.162	8.900	8.716	9.055	8.962	9.294	7.228-11.161	0.65558	4.597
35 PFHxDA	12.608	13.605	13.646	12.857	13.889	13.604	13.506	13.926	13.241	12.984	13.386	12.448-15.329	0.48009	6.944
36 PFODA	109.512	115.454	79.163	105.241	106.538	103.776	100.211	113.415	112.760	117.519	106.358	73.055-140.02(	11.16083	53.269

Report Date: 25-Jul-2021 09:48:01 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	950	1041	1029	876	998	880	903	986	804	810	Avg:A Wt:C2	928		RSD=9.3	
	102.4	112.2	111	94.4	107.5	94.9	97.3	106.3	86.6	87.3	Org:N Dep:R				
8 PFBA	1.146813	1.059173	1.042238	1.051551	0.909947	1.029134	1.006740	0.986184	0.990621	0.988340	Avg:A Wt:C2	1.021074		RSD=6.1	
	112.3	103.7	102.1	103	89.1	100.8	98.6	96.6	97	96.8	Org:N Dep:R				
D 50 13C5_PFPeA	923	1102	1079	974	1060	910	947	999	845	814	Avg:A Wt:C2	965		RSD=10.0	
	95.6	114.2	111.8	101	109.8	94.3	98.1	103.5	87.5	84.3	Org:N Dep:R				
21 PFPeA	1.197978	1.012791	1.056849	0.917932	0.899997	1.001852	0.992507	0.966523	0.933663	0.990988	Avg:A Wt:C2	0.997108		RSD=8.5	
	120.1	101.6	106	92.1	90.3	100.5	99.5	96.9	93.6	99.4	Org:N Dep:R				
D 44 13C3_PFBS	267	317	317	269	297	282	285	305	254	250	Avg:A Wt:C2	284		RSD=8.5	
	94	111.5	111.3	94.6	104.5	99.1	100.3	107.3	89.4	88	Org:N Dep:R				
7 PFBS	1.580666	1.398661	1.402926	1.488054	1.290474	1.322859	1.235271	1.272884	1.380991	1.396505	Avg:A Wt:C2	1.376929		RSD=7.5	
	114.8	101.6	101.9	108.1	93.7	96.1	89.7	92.4	100.3	101.4	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	2.029520	1.475642	1.742882	1.805585	1.758785	1.877358	1.930378	1.626018	1.635262	1.750316	Avg:A Wt:C2	1.763175		RSD=9.1	
	115.1	83.7	98.8	102.4	99.8	106.5	109.5	92.2	92.7	99.3	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	47.1942	54.8522	55.9664	42.7012	42.1506	42.1172	44.8436	49.2170	39.3464	40.7178	Avg:A Wt:C2	45.9107		RSD=12.7	
	102.8	119.5	121.9	93	91.8	91.7	97.7	107.2	85.7	88.7	Org:N Dep:R				
D 49 13C5_PFHxA	861	951	1000	826	864	832	818	865	728	719	Avg:A Wt:C2	846		RSD=10.2	
	101.7	112.4	118.2	97.6	102.1	98.3	96.6	102.2	86	84.9	Org:N Dep:R				
15 PFHxA	1.198144	0.986735	0.920777	0.895360	0.843057	0.942849	0.919120	0.985650	0.947218	0.936226	Avg:A Wt:C2	0.957513		RSD=9.9	
	125.1	103.1	96.2	93.5	88	98.5	96	102.9	98.9	97.8	Org:N Dep:R				
22 PFPeS	1.134294	1.086939	1.028873	1.093730	0.883939	0.983419	0.977044	1.001805	1.010647	1.011998	Avg:A Wt:C2	1.021269		RSD=6.9	
	111.1	106.4	100.7	107.1	86.6	96.3	95.7	98.1	99	99.1	Org:N Dep:R				
28 GenX	0.852201	0.853530	0.835546	0.795226	0.836315	0.743185	0.800094	0.773871	0.752296	0.762104	Avg:A Wt:C2	0.800437		RSD=5.2	
	106.5	106.6	104.4	99.3	104.5	92.8	100	96.7	94	95.2	Org:N Dep:R				
D 66 13C3_GenX	145	167	166	139	130	138	133	155	124	125	Avg:A Wt:C2	142		RSD=11.1	
	102.3	117.4	116.7	97.8	91.4	96.8	93.7	108.8	87	88	Org:N Dep:R				
13 PFHpA	0.954851	0.920540	0.820506	0.910998	0.795900	0.957770	0.900207	0.880841	0.854151	0.871575	Avg:A Wt:C2	0.886734		RSD=6.0	
	107.7	103.8	92.5	102.7	89.8	108	101.5	99.3	96.3	98.3	Org:N Dep:R				
D 47 13C4_PFHpA	882	956	1049	848	1038	812	871	903	770	748	Avg:A Wt:C2	888		RSD=11.5	
	99.4	107.7	118.2	95.6	116.9	91.5	98.1	101.7	86.7	84.3	Org:N Dep:R				
D 45 13C3_PFHxS	256	263	276	262	262	253	241	272	219	209	Avg:A Wt:C2	251		RSD=8.7	
	101.7	104.7	109.8	104.2	104.2	100.8	95.9	108.2	87.4	83.2	Org:N Dep:R				
14 PFHxS	1.213523	1.380104	1.177955	0.979047	1.077121	1.058400	1.092882	1.072833	1.070482	1.080769	Avg:A Wt:C2	1.120311		RSD=10.0	
	108.3	123.2	105.1	87.4	96.1	94.5	97.6	95.8	95.6	96.5	Org:N Dep:R				
29 ADONA	5.579970	5.588419	5.773344	4.866185	4.874659	4.889146	5.506762	4.979976	4.903456	5.194983	Avg:A Wt:C2	5.215690		RSD=6.9	
	107	107.1	110.7	93.3	93.5	93.7	105.6	95.5	94	99.6	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	39.5070	42.6430	44.2410	35.8804	35.8016	36.1596	35.4342	38.7242	30.3810	32.0692	Avg:A Wt:C2	37.0841		RSD=11.6	
	106.5	115	119.3	96.8	96.5	97.5	95.6	104.4	81.9	86.5	Org:N Dep:R				
2 6:2 FTS	4.091034	2.980045	2.437145	2.211402	2.036835	1.981750	1.774722	1.766019	2.022572	1.805377	Ln:A Wt:C2	1.878339	105	R^2=0.997	
	99.5	99.5	100.2	105.9	102.5	102.5	93.3	93.4	107.3	95.8	Org:N Dep:R			RSE=5.1	
D 53 13C8_PFOA	903	1013	930	810	991	800	823	901	697	673	Avg:A Wt:C2	854		RSD=13.4	
	105.7	118.6	108.9	94.8	116.1	93.7	96.4	105.5	81.6	78.8	Org:N Dep:R				
20 PFOA	0.985938	0.977420	1.052026	1.018179	0.790325	1.016598	0.948073	0.944526	0.999054	1.016250	Avg:A Wt:C2	0.974839		RSD=7.5	
	101.1	100.3	107.9	104.4	81.1	104.3	97.3	96.9	102.5	104.2	Org:N Dep:R				
12 PFHpS	1.138114	1.081066	1.026401	0.882795	0.941136	0.908291	0.909044	0.882044	0.922854	0.979797	Avg:A Wt:C2	0.967154		RSD=9.1	
	117.7	111.8	106.1	91.3	97.3	93.9	94	91.2	95.4	101.3	Org:N Dep:R				
D 54 13C8_PFOS	201	246	241	200	227	221	198	231	182	186	Avg:A Wt:C2	213		RSD=10.6	
	94.3	115	113	93.7	106.5	103.4	92.9	108.4	85.5	87.2	Org:N Dep:R				
18 PFOS	1.615397	1.222029	1.163891	1.127899	1.013758	1.035129	1.147065	1.060053	1.112581	1.125657	Ln:A Wt:C2	1.066137	22.9419	R^2=0.996	
	105.1	91.4	97.6	101.2	92.8	95.9	107.1	99.2	104.2	105.5	Org:N Dep:R			RSE=5.9	
D 56 13C9_PFNA	971	951	971	843	955	960	855	889	696	760	Avg:A Wt:C2	885		RSD=10.9	
	109.7	107.4	109.7	95.3	107.9	108.5	96.6	100.4	78.6	85.8	Org:N Dep:R				
17 PFNA	0.880468	0.906852	0.911943	0.794261	0.800623	0.782357	0.881177	0.833085	0.868302	0.826077	Avg:A Wt:C2	0.848514		RSD=5.6	
	103.8	106.9	107.5	93.6	94.4	92.2	103.8	98.2	102.3	97.4	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.050248	2.779960	2.809686	2.717631	2.436226	2.535250	2.768433	2.770505	2.975193	2.885626	Avg:A Wt:C2	2.772876		RSD=6.6	
	110	100.3	101.3	98	87.9	91.4	99.8	99.9	107.3	104.1	Org:N Dep:R				
D 55 13C8_PFOSA	409	449	474	382	392	406	400	419	342	335	Avg:A Wt:C2	401		RSD=10.7	
	102.1	112	118.3	95.3	97.7	101.3	99.9	104.5	85.2	83.7	Org:N Dep:R				
19 PFOSA	0.979673	0.984615	1.031199	0.994644	0.999436	1.007684	0.986103	0.907525	0.953988	1.038905	Avg:A Wt:C2	0.988377		RSD=3.8	
	99.1	99.6	104.3	100.6	101.1	102	99.8	91.8	96.5	105.1	Org:N Dep:R				
16 PFNS	0.980434	0.769781	1.031588	0.866133	0.766954	0.807540	1.049144	0.788487	0.844281	0.802401	Avg:A Wt:C2	0.870674		RSD=12.5	
	112.6	88.4	118.5	99.5	88.1	92.7	120.5	90.6	97	92.2	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	27.8110	32.3308	35.6072	29.1086	26.4296	28.9784	28.5850	30.4350	22.3080	23.9652	Avg:A Wt:C2	28.5559		RSD=13.5	
	97.4	113.2	124.7	101.9	92.6	101.5	100.1	106.6	78.1	83.9	Org:N Dep:R				
3 8:2 FTS	Disabled	1.484523	1.120144	1.591836	1.719264	1.623861	1.594461	1.479497	1.700315	1.625434	Avg:A Wt:C2	1.548815		RSD=11.6	
	Disabled	95.8	72.3	102.8	111	104.8	102.9	95.5	109.8	104.9	Org:N Dep:R				
D 51 13C6_PFDA	719	819	822	742	824	706	692	702	559	604	Avg:A Wt:C2	719		RSD=12.5	
	100	113.9	114.4	103.2	114.6	98.3	96.2	97.6	77.8	84	Org:N Dep:R				
10 PFDA	1.003998	1.029676	0.895466	0.858398	0.745678	0.886264	0.914353	0.945250	0.937233	0.860330	Avg:A Wt:C2	0.907664		RSD=8.8	
	110.6	113.4	98.7	94.6	82.2	97.6	100.7	104.1	103.3	94.8	Org:N Dep:R				
D 58 d3-MeFOSAA	181	191	199	167	172	169	176	201	165	168	Avg:A Wt:C2	179		RSD=7.6	
	101.3	106.5	111.2	93.1	96.3	94.6	98.5	112.4	92.2	93.9	Org:N Dep:R				
6 N-MeFOSAA	0.640302	0.763816	0.692958	0.760480	0.795089	0.786061	0.754875	0.730051	0.718919	0.724874	Avg:A Wt:C2	0.736743		RSD=6.3	
	86.9	103.7	94.1	103.2	107.9	106.7	102.5	99.1	97.6	98.4	Org:N Dep:R				
9 PFDS	1.154008	0.948948	0.889878	0.927011	0.836858	0.880502	0.930868	0.933472	0.886344	0.887976	Avg:A Wt:C2	0.927586		RSD=9.3	
	124.4	102.3	95.9	99.9	90.2	94.9	100.4	100.6	95.6	95.7	Org:N Dep:R				
D 52 13C7_PFUdA	696	769	788	677	741	635	644	674	557	543	Avg:A Wt:C2	673		RSD=12.2	
	103.5	114.4	117.2	100.7	110.3	94.3	95.8	100.2	82.8	80.8	Org:N Dep:R				
5 N-EtFOSAA	1.037323	1.079879	0.867912	0.838590	0.946677	0.919155	1.030310	0.979071	0.952913	0.938631	Avg:A Wt:C2	0.959046		RSD=7.9	
	108.2	112.6	90.5	87.4	98.7	95.8	107.4	102.1	99.4	97.9	Org:N Dep:R				
D 60 d5-EtFOSAA	171	177	198	164	166	163	151	160	133	137	Avg:A Wt:C2	162		RSD=11.6	
	105.5	109.1	122.2	101.3	102.5	100.6	93.3	98.7	82.4	84.4	Org:N Dep:R				
25 PFUdA	1.016106	0.876899	0.874664	1.022154	0.783580	0.893017	0.894509	0.839273	0.884614	0.898678	Avg:A Wt:C2	0.898349		RSD=8.1	
	113.1	97.6	97.4	113.8	87.2	99.4	99.6	93.4	98.5	100	Org:N Dep:R				
D 61 d7-MeFOSE	156	161	167	147	145	139	152	154	139	141	Avg:A Wt:C2	150		RSD=6.3	
	103.9	107.1	111.1	97.9	96.9	92.9	101.4	102.5	92.5	93.8	Org:N Dep:R				
32 MeFOSE	0.760372	1.209343	0.977559	0.869384	0.973337	0.912254	0.967018	0.985853	0.922259	0.921491	Avg:A Wt:C2	0.949887		RSD=11.9	
	80	127.3	102.9	91.5	102.5	96	101.8	103.8	97.1	97	Org:N Dep:R				
26 MeFOSA	0.876216	1.065571	1.086872	0.919038	1.003212	0.988993	1.069631	1.053974	1.111668	0.965690	Avg:A Wt:C2	1.014086		RSD=7.6	
	86.4	105.1	107.2	90.6	98.9	97.5	105.5	103.9	109.6	95.2	Org:N Dep:R				
D 57 d3-MeFOSA	54.3930	61.7040	69.0790	60.3740	60.7050	61.9170	59.5170	60.7900	48.9650	57.3380	Avg:A Wt:C2	59.4782		RSD=8.8	
	91.5	103.7	116.1	101.5	102.1	104.1	100.1	102.2	82.3	96.4	Org:N Dep:R				
31 11Cl-PF3OUDS	2.642467	2.270061	2.601265	2.486255	2.430307	2.248608	2.579621	2.421537	2.575656	2.564755	Avg:A Wt:C2	2.482053		RSD=5.6	
	106.5	91.5	104.8	100.2	97.9	90.6	103.9	97.6	103.8	103.3	Org:N Dep:R				
11 PFDoA	1.127561	0.978251	0.987515	1.038760	0.869028	0.934117	0.916309	0.912095	0.890305	0.891594	Avg:A Wt:C2	0.954553		RSD=8.4	
	118.1	102.5	103.5	108.8	91	97.9	96	95.6	93.3	93.4	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 62 d9-EtFOSE	146	151	152	142	135	140	140	162	134	132	Avg:A Wt:C2	143		RSD=6.6	
	101.9	105.3	106.1	98.7	94.5	97.3	97.7	113	93.4	92.1	Org:N Dep:R				
D 38 13C2_PFDoA	729	805	821	684	798	690	724	758	624	619	Avg:A Wt:C2	725		RSD=9.9	
	100.5	111	113.3	94.4	110.1	95.2	99.8	104.5	86	85.3	Org:N Dep:R				
4 10:2 FTS	2.426724	1.992820	1.961525	1.948776	2.262136	1.931901	2.144053	2.124346	2.349268	2.291521	Avg:A Wt:C2	2.143307		RSD=8.5	
	113.2	93	91.5	90.9	105.5	90.1	100	99.1	109.6	106.9	Org:N Dep:R				
33 EtFOSE	0.926756	0.844799	0.839146	0.764904	0.845000	0.780836	0.803994	0.757992	0.769115	0.812159	Avg:A Wt:C2	0.814470		RSD=6.3	
	113.8	103.7	103	93.9	103.7	95.9	98.7	93.1	94.4	99.7	Org:N Dep:R				
D 59 d5-EtFOSA	55.2900	63.7120	65.1060	56.3210	51.0360	53.8930	65.2340	59.0200	50.3220	54.5000	Avg:A Wt:C2	57.4434		RSD=9.7	
	96.3	110.9	113.3	98	88.8	93.8	113.6	102.7	87.6	94.9	Org:N Dep:R				
27 EtFOSA	1.358293	0.995260	0.986545	0.945402	1.121698	1.096803	0.866174	1.057157	1.047517	1.024664	Avg:A Wt:C2	1.049951		RSD=12.5	
	129.4	94.8	94	90	106.8	104.5	82.5	100.7	99.8	97.6	Org:N Dep:R				
34 PFDOS	0.958675	0.816395	0.869885	0.827601	0.817840	0.807037	0.894540	0.876747	0.894285	0.855082	Avg:A Wt:C2	0.861809		RSD=5.5	
	111.2	94.7	100.9	96	94.9	93.6	103.8	101.7	103.8	99.2	Org:N Dep:R				
24 PFTrDA	0.432147	0.378528	0.396174	0.389217	0.378403	0.401696	0.392792	0.408297	0.390939	0.414524	Avg:A Wt:C2	0.398272		RSD=4.2	
	108.5	95	99.5	97.7	95	100.9	98.6	102.5	98.2	104.1	Org:N Dep:R				
23 PFTeDA	0.927658	0.903478	0.850035	0.792872	0.720772	0.810338	0.803481	0.790766	0.775964	0.755555	Avg:A Wt:C2	0.813092		RSD=7.9	
	114.1	111.1	104.5	97.5	88.6	99.7	98.8	97.3	95.4	92.9	Org:N Dep:R				
D 42 13C2_PFTeDA	822	888	920	769	864	763	757	794	657	674	Avg:A Wt:C2	791		RSD=10.9	
	104	112.3	116.4	97.2	109.3	96.4	95.7	100.4	83.1	85.2	Org:N Dep:R				
35 PFHxDA	1.905047	1.693246	1.625163	1.480277	1.618115	1.609262	1.592655	1.492890	1.504416	1.556932	Avg:A Wt:C2	1.607800		RSD=7.7	
	118.5	105.3	101.1	92.1	100.6	100.1	99.1	92.9	93.6	96.8	Org:N Dep:R				
D 40 13C2_PFHxDA	431	461	472	416	383	392	383	449	352	334	Avg:A Wt:C2	407		RSD=11.4	
	105.7	113.2	116	102.1	94.1	96.3	94	110.2	86.4	81.9	Org:N Dep:R				
36 PFODA	1.230954	1.139357	1.155522	1.067024	1.206023	1.175109	1.201510	1.157251	1.227304	1.317428	Avg:A Wt:C2	1.187748		RSD=5.6	
	103.6	95.9	97.3	89.8	101.5	98.9	101.2	97.4	103.3	110.9	Org:N Dep:R				

Report Date: 25-Jul-2021 09:48:01 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	666581	745284	778057	688511	708463	648102	682214	670924	549041	567636	4.00
* 39 13C2_PFHxA	783044	932373	919191	782225	842604	859583	774741	866085	681533	696333	2.93
* 41 13C2_PFOA	907986	960441	1005225	822516	872798	847866	819629	876260	719647	730605	5.41
* 43 13C3_PFBA	909511	991323	1018602	870136	933046	835167	844857	915770	769676	784926	3.67
* 48 13C4_PFOS	234807	239606	252387	197038	216608	202921	211005	218690	179156	191479	5.08

13C2_PFDA ((|567636 - 666581| / (567636 + 666581)) / 2) * 100 = 4.01

13C2_PFHxA ((|696333 - 783044| / (696333 + 783044)) / 2) * 100 = 2.93

13C2_PFOA ((|730605 - 907986| / (730605 + 907986)) / 2) * 100 = 5.41

13C3_PFBA ((|784926 - 909511| / (784926 + 909511)) / 2) * 100 = 3.68

13C4_PFOS ((|191479 - 234807| / (191479 + 234807)) / 2) * 100 = 5.08

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	950390	1041161	1029443	876079	997866	880388	902879	986222	803630	810258	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	54496	110277	214585	460621	908005	1812074	4544820	9725960	11941390	16016213	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	922972	1101984	1079416	974464	1059542	909779	946666	998859	844615	813509	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	55285	111608	228156	447246	953585	1822928	4697864	9654204	11828789	16123551	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	267414	317199	316662	269037	297147	281833	285312	305059	254183	250392	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	18683	39219	78544	176951	338979	659155	1557774	3432613	4654585	6182232	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	4473	7560	18221	36006	69241	147701	404259	747459	901427	1331305	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	235971	274261	279832	213506	210753	210586	224218	246085	196732	203589	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	860865	951137	1000410	825717	864384	831703	818049	865011	728114	718849	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	783044	932373	919191	782225	842604	859583	774741	866085	681533	696333	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	51572	93852	184231	369657	728725	1568340	3759425	8525978	10345236	13460105	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	14226	32340	61121	138005	246375	519952	1307395	2866618	3614434	4753712	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	12384	28464	55393	110515	217113	408858	1064384	2392542	2790466	3810893	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	726589	833714	828695	694865	649017	687679	665162	772914	618211	625061	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	42114	88038	172164	386453	826040	1555833	3921306	7952483	9861805	13044212	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	882106	956373	1049133	848417	1037869	812216	871201	902828	769716	748313	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	255509	262968	275776	261757	261903	253350	240866	271798	219474	208898	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	14108	33026	59123	116604	256712	488025	1197733	2653504	3206971	4109022	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	67152	138434	299961	599940	1202640	2333645	6247305	12750418	15206440	20445575	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	197535	213215	221205	179402	179008	180798	177171	193621	151905	160346	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	7661	12047	20443	37610	69130	135866	298079	648315	873787	1097727	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	907986	960441	1005225	822516	872798	847866	819629	876260	719647	730605	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	903120	1012819	930191	809649	991369	800023	822974	900970	696627	673180	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	44521	98995	195717	412184	783504	1626603	3901197	8509896	10439518	13682377	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	13842	27064	53894	109993	234655	438140	1042239	2282303	2892307	3897064	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	201229	245511	241239	200063	227393	220723	198362	231281	182378	186054	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	15083	27842	52112	104702	213924	424053	1055758	2275179	2824511	3887077	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	234807	239606	252387	197038	216608	202921	211005	218690	179156	191479	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	971165	950828	971245	843131	954829	960112	855062	888521	696083	759834	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	42754	86226	177144	334833	764458	1502300	3767303	7402131	9066152	12553626	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	28603	63610	126343	253363	516310	1043072	2559048	5971931	7585684	10007484	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	409402	449069	474496	381972	391661	406095	400396	419164	341573	335466	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	20054	44216	97860	189963	391440	818431	1974159	3804017	4887849	6970346	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	9470	18143	47781	83175	167424	342226	998929	1750676	2217287	2866368	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	139055	161654	178036	145543	132148	144892	142925	152175	111540	119826	
3 8:2 FTS	Disabled	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	Disabled	4598	7642	22195	43531	90161	218317	431373	545063	746356	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	666581	745284	778057	688511	708463	648102	682214	670924	549041	567636	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	718667	818578	822058	741882	824029	706493	691532	701602	558988	603997	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	36077	84287	147225	318415	614460	1252278	3161521	6631896	7858528	10392733	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	907072	953305	995875	833000	862293	846681	881876	1005789	824966	840979	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	5808	14563	27604	63348	137120	266217	665706	1468554	1779252	2438414	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	11193	22459	41389	89392	183445	374701	890007	2081221	2337455	3185276	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	695971	769028	788120	677387	741490	634511	644207	674178	556901	543337	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	8860	19083	34358	68775	157181	299489	777981	1565364	1907754	2564622	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	854122	883571	989674	820127	830172	814577	755094	799413	667341	683075	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	35359	67436	137868	346197	581017	1133258	2881244	5658194	7389633	9765698	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	155871	160765	166793	146858	145483	139379	152142	153861	138826	140708	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	5926	19442	32610	63838	141604	254298	735620	1516844	1920503	2593223	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	2383	6575	15016	27743	60900	122471	318306	640711	816492	1107415	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	54393	61704	69079	60374	60705	61917	59517	60790	48965	57338	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	25045	52500	118226	234279	520582	935066	2410101	5275723	6637468	8990127	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	41082	78722	162213	355423	693572	1289042	3315371	6912677	8328230	11032454	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	146101	150888	152113	141555	135458	139555	140112	161978	133831	132021	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	728688	804722	821319	684322	798101	689979	723636	757890	623624	618693	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3253	6211	13466	27342	57635	107936	295407	623269	757812	1058795	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	6770	12747	25529	54138	114462	217939	563246	1227780	1543972	2144442	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	55290	63712	65106	56321	51036	53893	65234	59020	50322	54500	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3755	6341	12846	26623	57247	118220	282520	623934	790697	1116884	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	9337	19402	40627	80137	180020	344863	858823	1962861	2368181	3080009	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	15745	30461	65077	133175	302004	554324	1421192	3094443	3656987	5129262	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	38139	80235	156478	304751	622925	1236121	3039266	6276856	7652488	10184487	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	822264	888068	920421	768727	864247	762719	756525	793769	657461	673974	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41015	78070	153536	307623	620225	1262431	3047641	6701987	7943950	10389813	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	430593	461067	472371	415629	383301	392239	382712	448927	352028	333663	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	26502	52532	109167	221743	462270	921847	2299161	5195213	6480679	8791541	

Pace Environmental Services, LLC
Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.700	1.705	1.700	1.700	1.705	1.706	1.706	1.700	1.706	1.706	1.703	0.192
8 PFBA	1.706	1.705	1.706	1.706	1.705	1.706	1.706	1.706	1.706	1.706	1.706	0.028
D 50 13C5_PFPeA	2.056	2.055	2.056	2.056	2.055	2.056	2.056	2.056	2.056	2.056	2.055	0.015
21 PFPeA	2.056	2.055	2.056	2.056	2.055	2.056	2.056	2.056	2.056	2.056	2.055	0.015
D 44 13C3_PFBS	2.108	2.107	2.108	2.108	2.107	2.108	2.108	2.108	2.108	2.108	2.108	0.023
7 PFBS	2.118	2.118	2.108	2.108	2.118	2.108	2.108	2.108	2.108	2.108	2.111	0.218
1 4:2 FTS	2.379	2.379	2.388	2.380	2.379	2.379	2.388	2.380	2.380	2.388	2.381	0.183
D 63 13C2_4:2 FTS_2	2.388	2.379	2.380	2.380	2.388	2.379	2.380	2.380	2.380	2.379	2.381	0.154
D 49 13C5_PFHxA	2.423	2.422	2.423	2.423	2.422	2.423	2.423	2.423	2.423	2.423	2.422	0.021
* 39 13C2_PFHxA	2.423	2.422	2.423	2.423	2.422	2.423	2.423	2.423	2.423	2.423	2.422	0.021
15 PFHxA	2.423	2.422	2.423	2.423	2.422	2.423	2.423	2.423	2.423	2.423	2.422	0.021
22 PFPeS	2.458	2.457	2.449	2.458	2.457	2.458	2.458	2.458	2.449	2.457	2.455	0.139
28 GenX	2.536	2.544	2.536	2.536	2.544	2.545	2.536	2.545	2.536	2.544	2.540	0.171
D 66 13C3_GenX	2.536	2.535	2.545	2.536	2.544	2.536	2.536	2.545	2.536	2.544	2.539	0.172
13 PFHpA	2.801	2.792	2.801	2.801	2.800	2.801	2.801	2.801	2.801	2.800	2.799	0.090
D 47 13C4_PFHpA	2.792	2.801	2.792	2.801	2.800	2.801	2.801	2.801	2.801	2.800	2.798	0.134
D 45 13C3_PFHxS	2.809	2.810	2.810	2.810	2.818	2.818	2.809	2.818	2.818	2.818	2.813	0.165
14 PFHxS	2.809	2.810	2.810	2.810	2.818	2.809	2.809	2.818	2.810	2.818	2.812	0.149
29 ADONA	2.836	2.836	2.836	2.836	2.844	2.836	2.836	2.836	2.836	2.844	2.837	0.120
D 64 13C2_6:2 FTS_2	3.145	3.151	3.145	3.151	3.145	3.151	3.151	3.147	3.151	3.151	3.148	0.102
2 6:2 FTS	3.145	3.151	3.145	3.151	3.152	3.151	3.151	3.153	3.151	3.151	3.150	0.098
* 41 13C2_PFOA	3.170	3.177	3.170	3.177	3.171	3.177	3.177	3.178	3.177	3.183	3.175	0.123
D 53 13C8_PFOA	3.170	3.171	3.177	3.177	3.177	3.177	3.177	3.172	3.177	3.183	3.175	0.114
20 PFOA	3.170	3.177	3.170	3.177	3.177	3.177	3.177	3.178	3.183	3.183	3.176	0.133
12 PFHpS	3.183	3.177	3.177	3.183	3.183	3.183	3.183	3.185	3.183	3.189	3.182	0.119
D 54 13C8_PFOS	3.536	3.536	3.536	3.536	3.537	3.536	3.543	3.545	3.543	3.543	3.539	0.103
18 PFOS	3.543	3.536	3.543	3.536	3.537	3.543	3.543	3.545	3.543	3.550	3.542	0.121
* 48 13C4_PFOS	3.529	3.536	3.536	3.543	3.537	3.543	3.536	3.545	3.543	3.550	3.540	0.165
D 56 13C9_PFNA	3.536	3.543	3.543	3.543	3.544	3.543	3.543	3.545	3.543	3.550	3.543	0.087
17 PFNA	3.543	3.543	3.543	3.543	3.544	3.543	3.543	3.552	3.550	3.550	3.545	0.096
30 9Cl-PF3ONS	3.735	3.742	3.735	3.742	3.742	3.741	3.741	3.744	3.748	3.748	3.741	0.113
D 55 13C8_PFOSA	3.848	3.855	3.848	3.855	3.848	3.855	3.855	3.850	3.856	3.855	3.852	0.096
19 PFOSA	3.848	3.855	3.855	3.855	3.856	3.855	3.855	3.850	3.856	3.855	3.854	0.073

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.863	3.863	3.878	3.870	3.871	3.870	3.870	3.873	3.878	3.878	3.871	0.146
D 65 13C2_8:2 FTS_2	3.870	3.870	3.870	3.870	3.871	3.878	3.870	3.873	3.878	3.878	3.872	0.090
3 8:2 FTS	Disabled	3.870	3.870	3.870	3.871	3.870	3.878	3.873	3.878	3.878	3.873	0.092
* 37 13C2_PFDA	3.878	3.878	3.878	3.878	3.878	3.878	3.885	3.880	3.886	3.885	3.880	0.092
D 51 13C6_PFDA	3.878	3.878	3.878	3.878	3.878	3.878	3.878	3.880	3.886	3.885	3.879	0.082
10 PFDA	3.878	3.878	3.878	3.878	3.878	3.878	3.878	3.880	3.886	3.885	3.879	0.082
D 58 d3-MeFOSAA	4.029	4.030	4.030	4.030	4.030	4.029	4.030	4.032	4.030	4.039	4.030	0.079
6 N-MeFOSAA	4.020	4.030	4.030	4.040	4.030	4.039	4.039	4.032	4.040	4.039	4.033	0.169
9 PFDS	4.159	4.159	4.159	4.159	4.159	4.159	4.167	4.168	4.167	4.167	4.162	0.109
D 52 13C7_PFUdA	4.175	4.175	4.175	4.175	4.176	4.175	4.183	4.185	4.184	4.183	4.178	0.102
5 N-EtFOSAA	4.175	4.184	4.183	4.184	4.184	4.191	4.192	4.193	4.192	4.191	4.186	0.136
D 60 d5-EtFOSAA	4.175	4.175	4.175	4.184	4.184	4.183	4.183	4.185	4.184	4.191	4.182	0.122
25 PFUdA	4.175	4.175	4.175	4.184	4.184	4.183	4.183	4.185	4.184	4.183	4.181	0.094
D 61 d7-MeFOSE	4.282	4.282	4.282	4.282	4.283	4.282	4.282	4.283	4.282	4.282	4.282	0.011
32 MeFOSE	4.282	4.292	4.291	4.292	4.292	4.291	4.291	4.293	4.292	4.291	4.290	0.068
26 MeFOSA	4.301	4.301	4.301	4.301	4.301	4.301	4.301	4.302	4.301	4.301	4.300	0.016
D 57 d3-MeFOSA	4.301	4.301	4.301	4.301	4.301	4.301	4.301	4.302	4.301	4.301	4.300	0.016
31 11Cl-PF3OUDS	4.310	4.310	4.319	4.319	4.320	4.319	4.319	4.321	4.320	4.319	4.317	0.094
11 PFDoA	4.436	4.436	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.449	4.442	0.091
D 62 d9-EtFOSE	4.443	4.442	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.442	0.011
D 38 13C2_PFDoA	4.436	4.436	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.441	0.071
4 10:2 FTS	4.450	4.449	4.450	4.450	4.449	4.450	4.450	4.457	4.457	4.456	4.451	0.080
33 EtFOSE	4.450	4.449	4.456	4.450	4.456	4.456	4.457	4.457	4.457	4.456	4.454	0.078
D 59 d5-EtFOSA	4.456	4.464	4.465	4.457	4.464	4.465	4.465	4.465	4.465	4.464	4.463	0.077
27 EtFOSA	4.456	4.472	4.473	4.473	4.473	4.473	4.473	4.473	4.473	4.473	4.471	0.116
34 PFDOS	4.639	4.646	4.647	4.647	4.646	4.654	4.654	4.655	4.655	4.654	4.649	0.120
24 PFTrDA	4.669	4.669	4.670	4.670	4.677	4.677	4.677	4.678	4.677	4.677	4.674	0.085
23 PFTeDA	4.880	4.880	4.881	4.889	4.889	4.889	4.889	4.890	4.889	4.889	4.886	0.088
D 42 13C2_PFTeDA	4.880	4.880	4.881	4.881	4.889	4.889	4.889	4.890	4.889	4.889	4.885	0.094
35 PFHxDA	5.245	5.253	5.253	5.253	5.253	5.253	5.253	5.256	5.262	5.262	5.254	0.095
D 40 13C2_PFHxDA	5.245	5.244	5.245	5.245	5.253	5.253	5.253	5.256	5.254	5.253	5.250	0.091
36 PFODA	5.577	5.577	5.577	5.584	5.584	5.584	5.584	5.587	5.592	5.591	5.583	0.100

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221016.d
Injection Date: 22-Jul-2021 16:28:35 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 1 Auto Sampler: 1
Sample Info: ICAL 50_SVLC-1545A Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.705	3	950390	20	>100:1			1000.00	1024.31	95.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	3/0	54496	17	21:1			50.000	56.157		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	2	922972	15	>100:1			1000.00	956.27	87.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	2/0	55285	15	57:1			50.000	60.073		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	2	267414	15	>100:1			1000.00	940.20	90	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	3/1	18683	13	>100:1	Target = 3.65		44.200	50.740		
298.9 > 99	44	2.108	2.118		5625	15	27:1	3.32 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/-1	14226	13	83:1	Target = 3.30		46.900	52.091		M
349 > 99	44	2.458	2.457		3797	22	29:1	3.74 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	4	235971	18	>100:1			5000.00	5139.79	112	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.379	2.379	1/-3	4473	11	57:1	Target = 1.50		46.700	53.755		M
327 > 81	63	2.388	2.379		5239	10	36:1	0.85 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	4	860865	17	>100:1			1000.00	1017.06	99.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	4/0	51572	16	39:1	Target = 16.42		50.000	62.565		
313 > 119	49	2.423	2.422		2779	14	9.6:1	18.55 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	4	726589	17	>100:1			5000.00	5115.45	112	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.536	2.544	4/0	12384	15	35:1	Target = 0.77		100.00	106.47		
285 > 185	66	2.536	2.544		14215	15	37:1	0.87 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.792	2.800	4	882106	17	>100:1			1000.00	993.57	85	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	5/1	42114	18	72:1	Target = 3.14		50.000	53.841		
363 > 169	47	2.792	2.800		13726	22	31:1	3.06 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.809	2.818	5	255509	17	>100:1			1000.00	1017.03	97.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.809	2.818	0/-5	14108	25	70:1	Target = 3.31	0.12	45.500	49.286		
399 > 99	45	2.809	2.818		4820	23	25:1	2.92 (1.66-4.98)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	4/-1	67152	18	86:1	Target = 2.54		47.100	50.390		
377 > 85	45	2.836	2.844		29069	18	51:1	2.31 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	5/0	13842	25	>100:1	Target = 3.57		47.600	56.014		
449 > 99	45	3.177	3.183		3763	18	24:1	3.67 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.145	3.145	5	197535	22	>100:1			5000.00	5326.67	110.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.145	3.152	0/-5	7661	14	70:1	Target = 1.48		47.400	47.167		M
427 > 81	64	3.145	3.152		6629	18	71:1	1.15 (0.74-2.23)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.170	3.177	5	903120	21	>100:1			1000.00	1057.40	91.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.170	3.177	0/-5	44521	17	34:1	Target = 2.75		50.000	50.569		M
413 > 169	53	3.170	3.177		17784	20	34:1	2.50 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.537	4	201229	18	>100:1			1000.00	942.86	88.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.543	3.537	1/-3	15083	37	94:1	Target = 3.90	0.23	46.400	48.786		M
499 > 99	54	3.529	3.537		4717	34	31:1	3.19 (1.95-5.85)	0.14				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.735	3.742	4/0	28603	21	>100:1			46.600	51.261		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.863	3.871	4/0	9470	23	58:1	Target = 3.46		48.000	54.051		
549 > 99	54	3.863	3.871		2292	21	14:1	4.13 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	0/-4	11193	9	>100:1	Target = 3.36		48.200	59.966		M
599 > 99	54	4.151	4.159		3067	8	15:1	3.64 (1.68-5.04)					M
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.310	4.320	2/-2	25045	13	>100:1			47.100	50.144		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.639	4.646	-3/-7	9337	20	94:1	Target = 3.51		48.400	53.840		
699 > 99	54	4.647	4.646		2145	19		4.35 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.536	3.544	4	971165	19	>100:1			1000.00	1097.26	101.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	5/1	42754	21	88:1	Target = 4.84		50.000	51.883		
463 > 169	56	3.543	3.544		8135	28	39:1	5.25 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	5	409402	18	>100:1			1000.00	1021.13	104.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													a
498 > 78	55	3.848	3.856	0/-5	20054	17	25:1	Target = 42.34		50.000	49.560		
498>478	55	3.818	3.856		266	12		75.39 (21.17-63.51)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.870	3.871	4	139055	17	>100:1			5000.00	4869.58	105.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.870	3.871	4/0	2912	20	24:1	Target = 1.37		47.900	67.604		
527 > 81	65	3.863	3.871		2042	13	21:1	1.42 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.450	4.449	1/-3	3253	14	38:1	Target = 2.23		48.200	54.574		M
627 > 80	65	4.456	4.449		1703	20	20:1	1.91 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	4	718667	17	>100:1			1000.00	999.84	87.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	0/-4	36077	16	73:1	Target = 11.16		50.000	55.307		
513 > 169	51	3.870	3.878		3122	8	20:1	11.55 (5.58-16.75)					M
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.029	4.030	3	907072	16	>100:1			5000.00	5066.40	105.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.020	4.030	0/-3	5808	35	30:1	Target = 1.39	0.16	50.000	43.455		M
570 > 483	58	4.029	4.030		5486	26	29:1	1.05 (0.69-2.09)	0.25				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.175	4.176	2	695971	16	>100:1			1000.00	1034.88	93.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.175	4.184	2/0	35359	19	>100:1	Target = 10.79		50.000	56.554		
563 > 169	52	4.175	4.184		2565	19	13:1	13.78 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.175	4.184	2	854122	17	>100:1			5000.00	5274.20	102.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.175	4.184	0/-2	8860	35	60:1	Target = 1.79		50.000	54.081		M
584 > 526	60	4.175	4.184		4863	40	22:1	1.82 (0.89-2.69)	0.30				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	6	155871	15	>100:1			1000.00	1038.66	107.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.292	0/-6	5926	10	14:1			50.000	40.024		M
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	6	54393	17	>100:1			1000.00	914.50	89.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/-6	2383	10	10:1	Target = 1.04		50.000	43.202		M
512 > 219	57	4.301	4.301		3406	10	18:1	0.69 (0.52-1.57)					M
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.436	4.443	1	728688	18	>100:1			1000.00	1004.95	91.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.436	4.443	1/0	41082	15	22:1	Target = 7.82		50.000	59.062		
613 > 169	38	4.436	4.443		4822	15	41:1	8.51 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.669	4.677	0/-1	15745	17	70:1	Target = 3.35		50.000	54.253		
663 > 169	38	4.669	4.677		4890	19	35:1	3.21 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	5	146101	16	>100:1			1000.00	1019.11	107.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.450	4.456	0/-5	6770	14	33:1			50.000	56.893		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.456	4.464	5	55290	21	>100:1			1000.00	962.51	108.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.456	4.473	0/-5	3755	15	13:1	Target = 1.06		50.000	64.684		M
526 > 219	59	4.456	4.473		2878	12	24:1	1.30 (0.53-1.59)					M
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.880	4.889	-2	822264	19	>100:1			1000.00	1039.76	95.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.880	4.889	-1/1	38139	18	87:1	Target = 9.29		50.000	57.045		
713 > 169	42	4.880	4.889		4254	17	61:1	8.96 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.245	5.253	-4	430593	17	>100:1			1000.00	1057.31	112.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.245	5.253	-4/0	41015	15	5.1:1	Target = 13.38		50.000	59.244		
813 > 269	40	5.245	5.253		3253	20	67:1	12.60 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.577	5.584	-6/-2	26502	20	86:1	Target = 106.35		50.000	51.819		
913 > 319	40	5.577	5.584		242	26	25:1	109.51 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	3	666581	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	4	783044	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.170	3.171	5	907986	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	3	909511	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.529	3.537	4	234807	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221017.d
Injection Date: 22-Jul-2021 16:39:06 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 2 Auto Sampler: 2
Sample Info: ICAL 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.705	1	1041161	19	>100:1			1000.00	1122.14	104.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.705	0/-1	110277	18	45:1			100.00	103.73		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.055	0	1101984	15	>100:1			1000.00	1141.74	104	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.055	2.055	0/0	111608	16	>100:1			100.00	101.57		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.107	2.107	0	317199	15	>100:1			1000.00	1115.23	106.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	0/0	39219	15	>100:1	Target = 3.65		88.400	89.795		
298.9 > 99	44	2.107	2.118		11927	16	68:1	3.28 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.457	2.457	0/0	32340	17	>100:1	Target = 3.30		93.800	99.832		
349 > 99	44	2.457	2.457		9699	12	>100:1	3.33 (1.65-4.96)					M
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.379	2.388	0	274261	18	>100:1			5000.00	5973.80	130.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.379	2.379	0/0	7560	12	91:1	Target = 1.50		93.400	78.169		M
327 > 81	63	2.379	2.379		5352	10	25:1	1.41 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.422	2.422	0	951137	17	>100:1			1000.00	1123.71	110	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.422	2.422	0/0	93852	17	77:1	Target = 16.42		100.00	103.05		
313 > 119	49	2.414	2.422		5929	19	19:1	15.82 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.535	2.544	0	833714	16	>100:1			5000.00	5869.65	128.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.544	2.544	1/1	28464	16	92:1	Target = 0.77		200.00	213.27		
285 > 185	66	2.535	2.544		34133	19	>100:1	0.83 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	956373	18	>100:1			1000.00	1077.22	92.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.792	2.800	0/-1	88038	17	>100:1	Target = 3.14		100.00	103.81		
363 > 169	47	2.792	2.800		30121	15	88:1	2.92 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.810	2.818	1	262968	18	>100:1			1000.00	1046.72	100.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.810	2.818	1/0	33026	24	>100:1	Target = 3.31	0.16	91.000	112.10		
399 > 99	45	2.819	2.818		9697	23	52:1	3.40 (1.66-4.98)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	1/0	138434	17	>100:1	Target = 2.54		94.200	100.93		
377 > 85	45	2.836	2.844		56827	17	>100:1	2.43 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.177	3.183	0/-1	27064	29	>100:1	Target = 3.57		95.200	106.41		
449 > 99	45	3.183	3.183		6130	16	61:1	4.41 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	213215	22	>100:1			5000.00	5749.50	119.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	0/-1	12047	15	>100:1	Target = 1.48		94.800	94.333		M
427 > 81	64	3.151	3.152		8760	20	65:1	1.37 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.171	3.177	1	1012819	20	>100:1			1000.00	1185.84	102.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.177	3.177	1/0	98995	21	64:1	Target = 2.75		100.00	100.26		
413 > 169	53	3.177	3.177		33611	21	75:1	2.94 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.537	1	245511	19	>100:1			1000.00	1150.35	108	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.536	3.537	0/-1	27842	39	93:1	Target = 3.90	0.30	92.800	84.851		
499 > 99	54	3.543	3.537		6405	29	36:1	4.34 (1.95-5.85)	0.11				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.742	3.742	1/0	63610	19	>100:1			93.200	93.438		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.863	3.871	1/0	18143	23	>100:1	Target = 3.46		96.000	84.876		
549 > 99	54	3.870	3.871		6964	15	29:1	2.60 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	1/0	22459	13	>100:1	Target = 3.36		96.400	98.620		
599 > 99	54	4.159	4.159		7006	13		3.20 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.310	4.320	1/0	52500	22	>100:1			94.200	86.154		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.646	4.646	1/0	19402	16	>100:1	Target = 3.51		96.800	91.699		
699 > 99	54	4.646	4.646		5187	16	>100:1	3.74 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	1	950828	19	>100:1			1000.00	1074.28	99.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	1/0	86226	19	>100:1	Target = 4.84		100.00	106.88		
463 > 169	56	3.543	3.544		16963	16	>100:1	5.08 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	449069	18	>100:1			1000.00	1120.07	114.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/-1	44216	18	77:1	Target = 42.34		100.00	99.619		
498>478	55	3.841	3.856		1786	10	19:1	24.75 (21.17-63.51)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.870	3.871	1	161654	17	>100:1			5000.00	5660.97	122.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.870	3.871	0/-1	4598	11	24:1	Target = 1.37		95.800	91.823		M
527 > 81	65	3.863	3.871		4227	13	30:1	1.08 (0.68-2.05)					M
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.449	4.449	0/-1	6211	16	73:1	Target = 2.23		96.400	89.632		M
627 > 80	65	4.449	4.449		3356	23	24:1	1.85 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	1	818578	17	>100:1			1000.00	1138.84	99.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	1/0	84287	18	>100:1	Target = 11.16		100.00	113.44		
513 > 169	51	3.878	3.878		4829	22	28:1	17.45 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	1	953305	15	>100:1			5000.00	5324.63	110.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.030	4.030	0/-1	14563	24	54:1	Target = 1.39		100.00	103.67		M
570 > 483	58	4.030	4.030		10331	27	54:1	1.40 (0.69-2.09)	0.22				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.175	4.176	1	769028	16	>100:1			1000.00	1143.51	103.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.175	4.184	1/0	67436	16	>100:1	Target = 10.79		100.00	97.612		
563 > 169	52	4.175	4.184		7064	23	51:1	9.54 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.175	4.184	1	883571	17	>100:1			5000.00	5456.05	106.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.184	4.184	1/0	19083	27	>100:1	Target = 1.79	0.10	100.00	112.60		
584 > 526	60	4.184	4.184		10358	22	34:1	1.84 (0.89-2.69)	0.17				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	1	160765	14	>100:1			1000.00	1071.28	110.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.292	0/-1	19442	13	69:1			100.00	127.31		M
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	1	61704	15	>100:1			1000.00	1037.42	101.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/-1	6575	11	56:1	Target = 1.04		100.00	105.08		
512 > 219	57	4.301	4.301		6210	20	33:1	1.05 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.436	4.443	0	804722	17	>100:1			1000.00	1109.81	100.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.436	4.443	0/0	78722	18	70:1	Target = 7.82		100.00	102.48		
613 > 169	38	4.442	4.443		8968	25	88:1	8.77 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.669	4.677	0/0	30461	16	>100:1	Target = 3.35		100.00	95.043		
663 > 169	38	4.669	4.677		9648	14	>100:1	3.15 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.442	4.443	0	150888	17	>100:1			1000.00	1052.50	111.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.449	4.456	0/0	12747	14	70:1			100.00	103.72		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	1	63712	15	>100:1			1000.00	1109.13	124.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.472	4.473	0/-1	6341	12	37:1	Target = 1.06		100.00	94.791		M
526 > 219	59	4.464	4.473		6909	9	61:1	0.91 (0.53-1.59)					M
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.880	4.889	0	888068	19	>100:1			1000.00	1122.97	102.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.880	4.889	0/0	80235	18	>100:1	Target = 9.29		100.00	111.12		
713 > 169	42	4.880	4.889		7384	15	85:1	10.86 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.244	5.253	0	461067	16	>100:1			1000.00	1132.14	120.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/1	78070	15	9.3:1	Target = 13.38		100.00	105.31		
813 > 269	40	5.244	5.253		5738	15	>100:1	13.60 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.577	5.584	0/0	52532	21	>100:1	Target = 106.35		100.00	95.926		
913 > 319	40	5.569	5.584		455	15	35:1	115.45 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	1	745284	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.422	2.422	0	932373	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	960441	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.705	1.705	0	991323	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.536	3.537	1	239606	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221018.d
Injection Date: 22-Jul-2021 16:49:38 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 3 Auto Sampler: 3
Sample Info: ICAL 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.705	0	1029443	19	>100:1			1000.00	1109.51	103.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/1	214585	18	95:1			200.00	204.15		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	1079416	16	>100:1			1000.00	1118.36	101.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	228156	14	>100:1			200.00	211.98		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	316662	15	>100:1			1000.00	1113.35	106.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	78544	16	>100:1	Target = 3.65		176.80	180.14		
298.9 > 99	44	2.108	2.118		18978	14	97:1	4.13 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.449	2.457	0/-1	61121	19	>100:1	Target = 3.30		187.60	189.00		
349 > 99	44	2.449	2.457		20645	18	>100:1	2.96 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	279832	18	>100:1			5000.00	6095.14	132.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.379	1/1	18221	15	>100:1	Target = 1.50		186.80	184.65		
327 > 81	63	2.380	2.379		10914	9	80:1	1.66 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	1000410	18	>100:1			1000.00	1181.93	115.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	184231	15	>100:1	Target = 16.42		200.00	192.33		
313 > 119	49	2.423	2.422		11838	18	53:1	15.56 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.545	2.544	1	828695	17	>100:1			5000.00	5834.31	127.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.536	2.544	0/-1	55393	25	>100:1	Target = 0.77		400.00	417.54		
285 > 185	66	2.545	2.544		71330	16	>100:1	0.77 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.792	2.800	0	1049133	18	>100:1			1000.00	1181.70	101.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/1	172164	18	>100:1	Target = 3.14		200.00	185.06		
363 > 169	47	2.801	2.800		62577	18	>100:1	2.75 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.810	2.818	1	275776	16	>100:1			1000.00	1097.70	105.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.810	2.818	1/0	59123	27	>100:1	Target = 3.31	0.16	182.00	191.36		
399 > 99	45	2.810	2.818		17241	24	>100:1	3.42 (1.66-4.98)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	1/0	299961	18	>100:1	Target = 2.54		188.40	208.54		
377 > 85	45	2.836	2.844		91048	16	>100:1	3.29 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.177	3.183	0/-1	53894	20	>100:1	Target = 3.57		190.40	202.06		
449 > 99	45	3.177	3.183		15284	22	100:1	3.52 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.145	3.145	0	221205	20	>100:1			5000.00	5964.95	123.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.145	3.152	0/0	20443	19	>100:1	Target = 1.48		189.60	189.94		
427 > 81	64	3.158	3.152		14454	20	>100:1	1.41 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	1	930191	20	>100:1			1000.00	1089.10	93.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.170	3.177	0/-1	195717	21	>100:1	Target = 2.75		200.00	215.84		
413 > 169	53	3.170	3.177		78225	20	>100:1	2.50 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.537	1	241239	19	>100:1			1000.00	1130.33	106.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.543	3.537	1/0	52112	39	>100:1	Target = 3.90	0.28	185.60	181.10		M
499 > 99	54	3.536	3.537		12317	34	62:1	4.23 (1.95-5.85)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.735	3.742	0/-1	126343	20	>100:1			186.40	188.87		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.878	3.871	1/0	47781	16	>100:1	Target = 3.46		192.00	227.48		
549 > 99	54	3.863	3.871		11967	16	>100:1	3.99 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	0/-1	41389	17	>100:1	Target = 3.36		192.80	184.96		M
599 > 99	54	4.159	4.159		10999	23	49:1	3.76 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.319	4.320	1/0	118226	14	>100:1			188.40	197.45		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.647	4.646	1/0	40627	16	>100:1	Target = 3.51		193.60	195.41		
699 > 99	54	4.647	4.646		10798	16	>100:1	3.76 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	1	971245	19	>100:1			1000.00	1097.35	101.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	1/0	177144	19	>100:1	Target = 4.84		200.00	214.95		
463 > 169	56	3.550	3.544		36960	20	>100:1	4.79 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	0	474496	18	>100:1			1000.00	1183.49	121.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/0	97860	16	>100:1	Target = 42.34		200.00	208.67		
498>478	55	3.855	3.856		2412	17	26:1	40.57 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.870	3.871	1	178036	19	>100:1			5000.00	6234.65	134.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.870	3.871	0/-1	7642	11	36:1	Target = 1.37		191.60	138.57		M
527 > 81	65	3.863	3.871		8303	24		0.92 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.450	4.449	1/0	13466	16	>100:1	Target = 2.23		192.80	176.45		
627 > 80	65	4.443	4.449		6554	25	53:1	2.05 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	1	822058	17	>100:1			1000.00	1143.68	99.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	1/0	147225	17	>100:1	Target = 11.16		200.00	197.31		
513 > 169	51	3.878	3.878		15184	18	>100:1	9.69 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	1	995875	15	>100:1			5000.00	5562.41	115.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.030	4.030	0/-1	27604	33	>100:1	Target = 1.39	0.09	200.00	188.11		M
570 > 483	58	4.030	4.030		22371	29	88:1	1.23 (0.69-2.09)	0.29				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.175	4.176	1	788120	16	>100:1			1000.00	1171.90	106.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.175	4.184	1/0	137868	17	>100:1	Target = 10.79		200.00	194.73		
563 > 169	52	4.183	4.184		13094	17	65:1	10.52 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.175	4.184	1	989674	16	>100:1			5000.00	6111.24	119.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.183	4.184	0/-1	34358	33	>100:1	Target = 1.79	0.06	200.00	180.99		M
584 > 526	60	4.192	4.184		19116	36	56:1	1.79 (0.89-2.69)	0.20				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	1	166793	14	>100:1			1000.00	1111.45	114.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.292	0/-1	32610	11	97:1			200.00	205.83		M
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	1	69079	17	>100:1			1000.00	1161.42	113.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/-1	15016	12	47:1	Target = 1.04		200.00	214.35		M
512 > 219	57	4.301	4.301		12557	13	74:1	1.19 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	821319	17	>100:1			1000.00	1132.70	102.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	162213	17	72:1	Target = 7.82		200.00	206.91		
613 > 169	38	4.443	4.443		20752	20	>100:1	7.81 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.670	4.677	1/0	65077	18	>100:1	Target = 3.35		200.00	198.95		
663 > 169	38	4.670	4.677		17674	16	>100:1	3.68 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	152113	16	>100:1			1000.00	1061.05	112.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	25529	14	>100:1			200.00	206.06		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	65106	17	>100:1			1000.00	1133.39	127.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	12846	17	97:1	Target = 1.06		200.00	187.92		
526 > 219	59	4.465	4.473		13993	14	77:1	0.91 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.881	4.889	1	920421	18	>100:1			1000.00	1163.89	106.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.881	4.889	1/0	156478	19	>100:1	Target = 9.29		200.00	209.09		
713 > 169	42	4.881	4.889		15595	16	>100:1	10.03 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.245	5.253	1	472371	16	>100:1			1000.00	1159.90	123.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/0	153536	15	14:1	Target = 13.38		200.00	202.16		
813 > 269	40	5.253	5.253		11251	22	>100:1	13.64 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.577	5.584	1/0	109167	21	13:1	Target = 106.35		200.00	194.57		
913 > 319	40	5.577	5.584		1379	24	74:1	79.16 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	1	778057	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	919191	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.170	3.171	0	1005225	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.705	0	1018602	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.536	3.537	1	252387	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221019.d
Injection Date: 22-Jul-2021 17:00:12 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 4 Auto Sampler: 4
Sample Info: ICAL 500_SVLC-1548 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.705	0	876079	19	>100:1			1000.00	944.22	87.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/1	460621	20	>100:1			500.00	514.92		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	974464	16	>100:1			1000.00	1009.62	92	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	447246	15	>100:1			500.00	460.30		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	269037	15	>100:1			1000.00	945.90	90.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	176951	17	>100:1	Target = 3.65		442.00	477.67		
298.9 > 99	44	2.108	2.118		42770	16	>100:1	4.13 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/0	138005	17	>100:1	Target = 3.30		469.00	502.28		
349 > 99	44	2.449	2.457		40800	18	>100:1	3.38 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	213506	18	>100:1			5000.00	4650.47	101.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.380	2.379	1/1	36006	16	>100:1	Target = 1.50		467.00	478.23		M
327 > 81	63	2.380	2.379		23967	12	>100:1	1.50 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	825717	18	>100:1			1000.00	975.54	95.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	369657	19	>100:1	Target = 16.42		500.00	467.54		
313 > 119	49	2.423	2.422		25159	17	>100:1	14.69 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	0	694865	18	>100:1			5000.00	4892.10	107.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.536	2.544	0/0	110515	18	>100:1	Target = 0.77		1000.00	993.49		
285 > 185	66	2.536	2.544		143076	17	>100:1	0.77 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	848417	18	>100:1			1000.00	955.62	81.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/0	386453	18	>100:1	Target = 3.14		500.00	513.68		
363 > 169	47	2.801	2.800		125820	23	>100:1	3.07 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.810	2.818	1	261757	17	>100:1			1000.00	1041.90	99.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.810	2.818	1/0	116604	27	>100:1	Target = 3.31	0.16	455.00	397.63		
399 > 99	45	2.810	2.818		35750	24	>100:1	3.26 (1.66-4.98)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	1/0	599940	18	>100:1	Target = 2.54		471.00	439.44		
377 > 85	45	2.836	2.844		231733	19	>100:1	2.58 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	1/0	109993	22	>100:1	Target = 3.57		476.00	434.48		
449 > 99	45	3.177	3.183		34212	20	>100:1	3.21 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	179402	21	>100:1			5000.00	4837.70	100.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	1/0	37610	22	>100:1	Target = 1.48		474.00	501.98		
427 > 81	64	3.158	3.152		23127	21	>100:1	1.62 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	1	809649	21	>100:1			1000.00	947.96	81.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.177	3.177	1/0	412184	21	>100:1	Target = 2.75		500.00	522.23		
413 > 169	53	3.171	3.177		131797	22	>100:1	3.12 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.537	1	200063	18	>100:1			1000.00	937.40	88	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.536	3.537	0/-1	104702	38	>100:1	Target = 3.90	0.25	464.00	469.36		
499 > 99	54	3.536	3.537		28493	39	>100:1	3.67 (1.95-5.85)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.742	3.742	1/0	253363	19	>100:1			466.00	456.72		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.870	3.871	1/0	83175	18	>100:1	Target = 3.46		480.00	477.50		
549 > 99	54	3.870	3.871		26886	19		3.09 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	1/0	89392	15	>100:1	Target = 3.36		482.00	481.70		
599 > 99	54	4.159	4.159		28907	21	>100:1	3.09 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.319	4.320	1/0	234279	15	>100:1			471.00	471.80		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.647	4.646	1/0	80137	15	>100:1	Target = 3.51		484.00	464.79		
699 > 99	54	4.655	4.646		27767	17	>100:1	2.88 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	1	843131	19	>100:1			1000.00	952.60	88.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	1/0	334833	19	>100:1	Target = 4.84		500.00	468.03		
463 > 169	56	3.543	3.544		71163	18	>100:1	4.70 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	381972	18	>100:1			1000.00	952.72	97.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	1/0	189963	20	>100:1	Target = 42.34		500.00	503.17		
498>478	55	3.848	3.856		4826	14	45:1	39.36 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.870	3.871	1	145543	18	>100:1			5000.00	5096.78	110.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.870	3.871	1/0	22195	24	89:1	Target = 1.37		479.00	492.31		
527 > 81	65	3.870	3.871		17357	23	>100:1	1.27 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.450	4.449	1/0	27342	16	>100:1	Target = 2.23		482.00	438.25		
627 > 80	65	4.450	4.449		11805	16	>100:1	2.31 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	1	741882	17	>100:1			1000.00	1032.14	90	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	1/0	318415	17	>100:1	Target = 11.16		500.00	472.86		
513 > 169	51	3.878	3.878		27849	18	>100:1	11.43 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	1	833000	16	>100:1			5000.00	4652.68	96.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.040	4.030	1/0	63348	36	>100:1	Target = 1.39	0.08	500.00	516.11		M
570 > 483	58	4.030	4.030		42611	28	>100:1	1.48 (0.69-2.09)	0.20				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.175	4.176	1	677387	16	>100:1			1000.00	1007.25	91.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.184	4.184	1/0	346197	16	>100:1	Target = 10.79		500.00	568.91		
563 > 169	52	4.184	4.184		25863	16	>100:1	13.38 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.184	4.184	1	820127	17	>100:1			5000.00	5064.28	98.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.184	4.184	0/-1	68775	32	>100:1	Target = 1.79		500.00	437.20		M
584 > 526	60	4.184	4.184		43484	38	>100:1	1.58 (0.89-2.69)	0.26				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	1	146858	15	>100:1			1000.00	978.61	100.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.292	1/0	63838	14	>100:1			500.00	457.62		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	1	60374	20	>100:1			1000.00	1015.06	99.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/-1	27743	14	54:1	Target = 1.04		500.00	453.14		M
512 > 219	57	4.301	4.301		29686	13	>100:1	0.93 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	684322	17	>100:1			1000.00	943.77	85.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	355423	17	>100:1	Target = 7.82		500.00	544.11		
613 > 169	38	4.436	4.443		44184	16	>100:1	8.04 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.670	4.677	1/0	133175	19	>100:1	Target = 3.35		500.00	488.63		
663 > 169	38	4.670	4.677		41280	17	>100:1	3.22 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	141555	16	>100:1			1000.00	987.40	104.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.450	4.456	0/-1	54138	15	>100:1			500.00	469.57		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.457	4.464	0	56321	16	>100:1			1000.00	980.46	110.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/1	26623	18	>100:1	Target = 1.06		500.00	450.21		
526 > 219	59	4.473	4.473		26225	16	>100:1	1.01 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.881	4.889	1	768727	18	>100:1			1000.00	972.07	88.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	304751	19	>100:1	Target = 9.29		500.00	487.57		
713 > 169	42	4.881	4.889		33525	21	>100:1	9.09 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.245	5.253	1	415629	17	>100:1			1000.00	1020.57	108.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/0	307623	17	38:1	Target = 13.38		500.00	460.34		
813 > 269	40	5.253	5.253		23926	16	>100:1	12.85 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.584	5.584	1/0	221743	21	37:1	Target = 106.35		500.00	449.18		
913 > 319	40	5.577	5.584		2107	22	91:1	105.24 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	1	688511	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	782225	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	822516	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.705	0	870136	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	197038	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221020.d
Injection Date: 22-Jul-2021 17:10:44 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 5 Auto Sampler: 5
Sample Info: ICAL 1000_SVLC-1549 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.705	1	997866	20	>100:1			1000.00	1075.48	100	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.705	0/-1	908005	19	>100:1			1000.00	891.17		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.055	0	1059542	15	>100:1			1000.00	1097.77	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.055	2.055	0/0	953585	15	>100:1			1000.00	902.61		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.107	2.107	0	297147	15	>100:1			1000.00	1044.73	100	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	1/1	338979	15	>100:1	Target = 3.65		884.00	828.49		
298.9 > 99	44	2.118	2.118		90940	16	>100:1	3.72 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.457	2.457	1/1	246375	20	>100:1	Target = 3.30		938.00	811.87		
349 > 99	44	2.457	2.457		80014	18	>100:1	3.07 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	1	210753	17	>100:1			5000.00	4590.50	100	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.379	2.379	0/-1	69241	19	>100:1	Target = 1.50		934.00	931.67		
327 > 81	63	2.388	2.379		49603	19	>100:1	1.39 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.422	2.422	0	864384	18	>100:1			1000.00	1021.22	100	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.422	2.422	0/0	728725	18	>100:1	Target = 16.42		1000.00	880.46		
313 > 119	49	2.422	2.422		47551	18	>100:1	15.32 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.544	2.544	1	649017	18	>100:1			5000.00	4569.31	100	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.544	2.544	1/0	217113	18	>100:1	Target = 0.77		2000.00	2089.65		
285 > 185	66	2.544	2.544		271488	19	>100:1	0.79 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.800	2.800	1	1037869	18	>100:1			1000.00	1169.01	100	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.800	2.800	1/0	826040	17	>100:1	Target = 3.14		1000.00	897.56		
363 > 169	47	2.800	2.800		243084	17	>100:1	3.39 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	261903	20	>100:1			1000.00	1042.48	100	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	0/-1	256712	26	>100:1	Target = 3.31	0.15	910.00	874.92		
399 > 99	45	2.818	2.818		74159	26	>100:1	3.46 (1.66-4.98)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.844	2.844	1/0	1202640	18	>100:1	Target = 2.54		942.00	880.41		
377 > 85	45	2.844	2.844		474980	18	>100:1	2.53 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	1/0	234655	21	>100:1	Target = 3.57		952.00	926.39		
449 > 99	45	3.177	3.183		62769	20	>100:1	3.73 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.145	3.145	0	179008	20	>100:1			5000.00	4827.08	100	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.152	3.152	1/1	69130	20	>100:1	Target = 1.48		948.00	971.92		
427 > 81	64	3.152	3.152		48793	20	>100:1	1.41 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	1	991369	22	>100:1			1000.00	1160.73	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.177	3.177	1/0	783504	22	>100:1	Target = 2.75		1000.00	810.72		
413 > 169	53	3.177	3.177		298292	22	>100:1	2.62 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.537	3.537	1	227393	21	>100:1			1000.00	1065.46	100	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.537	3.537	0/-1	213924	40	>100:1	Target = 3.90	0.25	928.00	860.89		
499 > 99	54	3.537	3.537		56881	37	>100:1	3.76 (1.95-5.85)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.742	3.742	1/0	516310	20	>100:1			932.00	818.85		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.871	3.871	1/0	167424	20	>100:1	Target = 3.46		960.00	845.64		
549 > 99	54	3.871	3.871		51993	17	>100:1	3.22 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	1/0	183445	17	>100:1	Target = 3.36		964.00	869.71		
599 > 99	54	4.167	4.159		48486	15	>100:1	3.78 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.320	4.320	1/0	520582	15	>100:1			942.00	922.36		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.646	4.646	1/0	180020	17	>100:1	Target = 3.51		968.00	918.61		
699 > 99	54	4.646	4.646		51887	16		3.46 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.544	3.544	1	954829	19	>100:1			1000.00	1078.80	100	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.544	3.544	1/0	764458	20	>100:1	Target = 4.84		1000.00	943.56		
463 > 169	56	3.544	3.544		158543	19	>100:1	4.82 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	0	391661	20	>100:1			1000.00	976.88	100	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.856	1/1	391440	18	>100:1	Target = 42.34		1000.00	1011.19		
498>478	55	3.863	3.856		8912	18	81:1	43.92 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.871	3.871	1	132148	21	>100:1			5000.00	4627.70	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.871	3.871	1/0	43531	16	>100:1	Target = 1.37		958.00	1063.43		
527 > 81	65	3.871	3.871		32544	18	>100:1	1.33 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.449	4.449	1/0	57635	17	>100:1	Target = 2.23		964.00	1017.45		
627 > 80	65	4.449	4.449		23490	15	>100:1	2.45 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	1	824029	19	>100:1			1000.00	1146.42	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	1/0	614460	18	>100:1	Target = 11.16		1000.00	821.53		
513 > 169	51	3.878	3.878		64885	19	>100:1	9.46 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	1	862293	16	>100:1			5000.00	4816.29	100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.030	4.030	0/-1	137120	33	>100:1	Target = 1.39	0.08	1000.00	1079.20		M
570 > 483	58	4.030	4.030		96287	30	>100:1	1.42 (0.69-2.09)	0.07				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.176	4.176	1	741490	17	>100:1			1000.00	1102.57	100	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.184	4.184	1/0	581017	15	>100:1	Target = 10.79		1000.00	872.24		
563 > 169	52	4.176	4.184		56661	18	>100:1	10.25 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.184	4.184	1	830172	17	>100:1			5000.00	5126.31	100	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.184	4.184	0/-1	157181	32	>100:1	Target = 1.79		1000.00	987.10		M
584 > 526	60	4.192	4.184		76080	31	>100:1	2.06 (0.89-2.69)	0.21				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.283	4.283	1	145483	14	>100:1			1000.00	969.44	100	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.292	1/0	141604	15	>100:1			1000.00	1024.69		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	1	60705	13	>100:1			1000.00	1020.63	100	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/-1	60900	15	42:1	Target = 1.04		1000.00	989.28		
512 > 219	57	4.301	4.301		57587	17	>100:1	1.05 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	798101	17	>100:1			1000.00	1100.68	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	693572	17	>100:1	Target = 7.82		1000.00	910.40		
613 > 169	38	4.443	4.443		86533	18	>100:1	8.01 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.677	4.677	1/0	302004	16	>100:1	Target = 3.35		1000.00	950.11		
663 > 169	38	4.677	4.677		89717	15	>100:1	3.36 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	135458	15	>100:1			1000.00	944.87	100	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	114462	22	>100:1			1000.00	1037.48		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	1	51036	15	>100:1			1000.00	888.46	100	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	0/-1	57247	15	>100:1	Target = 1.06		1000.00	1068.33		
526 > 219	59	4.473	4.473		53587	14	>100:1	1.06 (0.53-1.59)					M
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	864247	18	>100:1			1000.00	1092.85	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	622925	18	>100:1	Target = 9.29		1000.00	886.46		
713 > 169	42	4.889	4.889		67743	18	>100:1	9.19 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.253	5.253	1	383301	17	>100:1			1000.00	941.19	100	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/0	620225	17	74:1	Target = 13.38		1000.00	1006.42		
813 > 269	40	5.253	5.253		44655	16	>100:1	13.88 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.584	5.584	1/0	462270	20	75:1	Target = 106.35		1000.00	1015.39		
913 > 319	40	5.584	5.584		4339	22	>100:1	106.53 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	1	708463	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.422	2.422	0	842604	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.171	3.171	0	872798	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.705	1.705	1	933046	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.537	3.537	1	216608	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221021.d
Injection Date: 22-Jul-2021 17:21:19 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 6 Auto Sampler: 6
Sample Info: ICAL 2000_SVLC-1550 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	880388	20	>100:1			1000.00	948.87	88.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/0	1812074	20	>100:1			2000.00	2015.79		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	909779	16	>100:1			1000.00	942.60	85.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	1822928	15	>100:1			2000.00	2009.52		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	281833	15	>100:1			1000.00	990.89	94.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	659155	15	>100:1	Target = 3.65		1768.00	1698.57		
298.9 > 99	44	2.108	2.118		179544	15	>100:1	3.67 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/0	519952	17	>100:1	Target = 3.30		1876.00	1806.47		
349 > 99	44	2.458	2.457		162794	17	>100:1	3.19 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.379	2.388	0	210586	17	>100:1			5000.00	4586.87	99.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.379	2.379	1/1	147701	17	>100:1	Target = 1.50		1868.00	1988.97		
327 > 81	63	2.379	2.379		90842	18	>100:1	1.62 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	831703	18	>100:1			1000.00	982.61	96.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	1568340	18	>100:1	Target = 16.42		2000.00	1969.37		
313 > 119	49	2.423	2.422		89623	21	>100:1	17.49 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	0	687679	17	>100:1			5000.00	4841.51	106	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.545	2.544	1/1	408858	17	>100:1	Target = 0.77		4000.00	3713.90		
285 > 185	66	2.536	2.544		558476	17	>100:1	0.73 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	812216	18	>100:1			1000.00	914.85	78.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/0	1555833	18	>100:1	Target = 3.14		2000.00	2160.22		
363 > 169	47	2.801	2.800		461137	19	>100:1	3.37 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	253350	19	>100:1			1000.00	1008.44	96.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.809	2.818	0/-1	488025	26	>100:1	Target = 3.31	0.19	1820.00	1719.42		
399 > 99	45	2.809	2.818		143168	25	>100:1	3.40 (1.66-4.98)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	0/-1	2333645	18	>100:1	Target = 2.54		1884.00	1766.05		
377 > 85	45	2.836	2.844		935402	17	>100:1	2.49 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	0/-1	438140	22	>100:1	Target = 3.57		1904.00	1788.12		
449 > 99	45	3.183	3.183		135229	21	>100:1	3.23 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	180798	21	>100:1			5000.00	4875.35	101	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	0/-1	135866	23	>100:1	Target = 1.48		1896.00	1944.31		
427 > 81	64	3.151	3.152		81360	19	>100:1	1.66 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	0	800023	22	>100:1			1000.00	936.69	80.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.177	3.177	0/0	1626603	22	>100:1	Target = 2.75		2000.00	2085.67		
413 > 169	53	3.183	3.177		589917	23	>100:1	2.75 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.537	0	220723	21	>100:1			1000.00	1034.20	97.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.543	3.537	1/1	424053	39	>100:1	Target = 3.90	0.29	1856.00	1780.50		
499 > 99	54	3.543	3.537		115033	39	>100:1	3.68 (1.95-5.85)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.741	3.742	0/0	1043072	20	>100:1			1864.00	1704.26		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.870	3.871	0/0	342226	18	>100:1	Target = 3.46		1920.00	1780.78		
549 > 99	54	3.870	3.871		97076	18	>100:1	3.52 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	0/0	374701	16	>100:1	Target = 3.36		1928.00	1830.13		
599 > 99	54	4.159	4.159		113101	16	>100:1	3.31 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.319	4.320	0/0	935066	15	>100:1			1884.00	1706.80		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.654	4.646	1/1	344863	16	>100:1	Target = 3.51		1936.00	1812.96		
699 > 99	54	4.647	4.646		103215	17	>100:1	3.34 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	0	960112	19	>100:1			1000.00	1084.77	100.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	0/0	1502300	19	>100:1	Target = 4.84		2000.00	1844.06		
463 > 169	56	3.543	3.544		298811	19	>100:1	5.02 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	406095	18	>100:1			1000.00	1012.88	103.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/-1	818431	19	>100:1	Target = 42.34		2000.00	2039.07		
498>478	55	3.855	3.856		19658	16	>100:1	41.63 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.878	3.871	1	144892	18	>100:1			5000.00	5073.98	109.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.870	3.871	0/-1	90161	18	>100:1	Target = 1.37		1916.00	2008.84		
527 > 81	65	3.870	3.871		54495	18	>100:1	1.65 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.450	4.449	1/0	107936	16	>100:1	Target = 2.23		1928.00	1737.83		
627 > 80	65	4.450	4.449		47417	18	>100:1	2.27 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	0	706493	17	>100:1			1000.00	982.90	85.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	0/0	1252278	18	>100:1	Target = 11.16		2000.00	1952.84		
513 > 169	51	3.878	3.878		120273	17	>100:1	10.41 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.029	4.030	0	846681	15	>100:1			5000.00	4729.09	98.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.039	4.030	1/1	266217	33	>100:1	Target = 1.39	0.08	2000.00	2133.88		M
570 > 483	58	4.039	4.030		178287	32	>100:1	1.49 (0.69-2.09)	0.22				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.175	4.176	0	634511	17	>100:1			1000.00	943.49	85.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.183	4.184	0/0	1133258	17	>100:1	Target = 10.79		2000.00	1988.13		
563 > 169	52	4.183	4.184		118550	17	>100:1	9.55 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.183	4.184	0	814577	17	>100:1			5000.00	5030.01	98.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.191	4.184	1/1	299489	34	>100:1	Target = 1.79		2000.00	1916.81		M
584 > 526	60	4.191	4.184		173678	34	>100:1	1.72 (0.89-2.69)	0.25				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	0	139379	15	>100:1			1000.00	928.77	95.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.292	0/0	254298	15	>100:1			2000.00	1920.76		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	61917	13	>100:1			1000.00	1041.00	102	M
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/0	122471	12	50:1	Target = 1.04		2000.00	1950.51		
512 > 219	57	4.301	4.301		114646	18	>100:1	1.06 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	689979	17	>100:1			1000.00	951.57	86.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	1289042	17	>100:1	Target = 7.82		2000.00	1957.18		
613 > 169	38	4.443	4.443		173752	18	>100:1	7.41 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.677	4.677	1/0	554324	16	>100:1	Target = 3.35		2000.00	2017.20		
663 > 169	38	4.677	4.677		163650	16	>100:1	3.38 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	139555	19	>100:1			1000.00	973.45	103	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	217939	16	>100:1			2000.00	1917.41		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	53893	16	>100:1			1000.00	938.19	105.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	118220	15	>100:1	Target = 1.06		2000.00	2089.25		
526 > 219	59	4.473	4.473		115806	17	>100:1	1.02 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	762719	18	>100:1			1000.00	964.47	88.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	1236121	18	>100:1	Target = 9.29		2000.00	1993.23		
713 > 169	42	4.889	4.889		134907	18	>100:1	9.16 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.253	5.253	1	392239	17	>100:1			1000.00	963.13	102.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/0	1262431	17	>100:1	Target = 13.38		2000.00	2001.82		
813 > 269	40	5.253	5.253		92792	17	>100:1	13.60 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.584	5.584	1/0	921847	21	>100:1	Target = 106.35		2000.00	1978.72		
913 > 319	40	5.584	5.584		8883	22	>100:1	103.77 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	0	648102	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	859583	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	847866	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	835167	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	202921	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221022.d		
Injection Date:	22-Jul-2021 17:31:51	Injection Vol:	10.0 uL
Sample Type:	Ical, Level: 7	Auto Sampler:	7
Sample Info:	ICAL 5000_SVLC-1551	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	902879	20	>100:1			1000.00	973.11	90.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/0	4544820	20	>100:1			5000.00	4929.81		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	946666	16	>100:1			1000.00	980.82	89.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	4697864	15	>100:1			5000.00	4976.93		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	285312	15	>100:1			1000.00	1003.12	96	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	1557774	15	>100:1	Target = 3.65		4420.00	3965.27		
298.9 > 99	44	2.108	2.118		466798	15	>100:1	3.33 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/0	1307395	17	>100:1	Target = 3.30		4690.00	4486.90		
349 > 99	44	2.458	2.457		404325	17	>100:1	3.23 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	224218	18	>100:1			5000.00	4883.79	106.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.379	1/1	404259	17	>100:1	Target = 1.50		4670.00	5112.86		
327 > 81	63	2.380	2.379		218976	17	>100:1	1.84 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	818049	17	>100:1			1000.00	966.48	94.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	3759425	18	>100:1	Target = 16.42		5000.00	4799.51		
313 > 119	49	2.423	2.422		221269	19	>100:1	16.99 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	0	665162	17	>100:1			5000.00	4682.98	102.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.536	2.544	0/0	1064384	17	>100:1	Target = 0.77		10000	9995.72		
285 > 185	66	2.536	2.544		1460458	17	>100:1	0.72 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	871201	18	>100:1			1000.00	981.28	83.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/0	3921306	18	>100:1	Target = 3.14		5000.00	5075.97		
363 > 169	47	2.801	2.800		1139070	18	>100:1	3.44 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.809	2.818	0	240866	18	>100:1			1000.00	958.75	92	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.809	2.818	0/0	1197733	25	>100:1	Target = 3.31	0.16	4550.00	4438.60		
399 > 99	45	2.818	2.818		349276	25	>100:1	3.42 (1.66-4.98)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	0/0	6247305	19	>100:1	Target = 2.54		4710.00	4972.85		
377 > 85	45	2.836	2.844		2467446	17	>100:1	2.53 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	0/0	1042239	22	>100:1	Target = 3.57		4760.00	4474.00		
449 > 99	45	3.183	3.183		307071	22	>100:1	3.39 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	177171	27	>100:1			5000.00	4777.54	99	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	0/-1	298079	21	>100:1	Target = 1.48		4740.00	4422.45		
427 > 81	64	3.151	3.152		204531	21	>100:1	1.45 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	0	822974	22	>100:1			1000.00	963.57	83	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.177	3.177	0/0	3901197	22	>100:1	Target = 2.75		5000.00	4862.72		
413 > 169	53	3.177	3.177		1356320	22	>100:1	2.87 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	198362	19	>100:1			1000.00	929.43	87.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.543	3.537	1/0	1055758	39	>100:1	Target = 3.90	0.26	4640.00	4970.69		
499 > 99	54	3.543	3.537		275070	41	>100:1	3.83 (1.95-5.85)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.741	3.742	0/-1	2559048	20	>100:1			4660.00	4652.53		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.870	3.871	0/-1	998929	18	>100:1	Target = 3.46		4800.00	5783.89		
549 > 99	54	3.878	3.871		235365	17	>100:1	4.24 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.167	4.159	1/0	890007	17	>100:1	Target = 3.36		4820.00	4837.05		
599 > 99	54	4.167	4.159		281335	17	>100:1	3.16 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.319	4.320	0/-1	2410101	15	>100:1			4710.00	4895.15		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.654	4.646	1/0	858823	17	>100:1	Target = 3.51		4840.00	5023.82		
699 > 99	54	4.647	4.646		249383	17	>100:1	3.44 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	0	855062	21	>100:1			1000.00	966.08	89.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	0/0	3767303	18	>100:1	Target = 4.84		5000.00	5192.47		
463 > 169	56	3.543	3.544		777766	19	>100:1	4.84 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	400396	19	>100:1			1000.00	998.67	102.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/-1	1974159	18	>100:1	Target = 42.34		5000.00	4988.50		
498>478	55	3.855	3.856		50422	17	>100:1	39.15 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.870	3.871	0	142925	17	>100:1			5000.00	5005.10	108.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.878	3.871	1/1	218317	17	>100:1	Target = 1.37		4790.00	4931.17		
527 > 81	65	3.870	3.871		138008	18		1.58 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.450	4.449	1/1	295407	17	>100:1	Target = 2.23		4820.00	4821.68		
627 > 80	65	4.457	4.449		124921	19	>100:1	2.36 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	0	691532	18	>100:1			1000.00	962.09	83.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	0/0	3161521	18	>100:1	Target = 11.16		5000.00	5036.84		
513 > 169	51	3.878	3.878		306138	17	>100:1	10.32 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	0	881876	16	>100:1			5000.00	4925.67	102.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.039	4.030	1/1	665706	36	>100:1	Target = 1.39	0.09	5000.00	5123.06		M
570 > 483	58	4.039	4.030		442597	34	>100:1	1.50 (0.69-2.09)	0.11				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.183	4.176	1	644207	18	>100:1			1000.00	957.91	86.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.183	4.184	0/-1	2881244	17	>100:1	Target = 10.79		5000.00	4978.62		
563 > 169	52	4.183	4.184		285607	16	>100:1	10.08 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.183	4.184	0	755094	17	>100:1			5000.00	4662.71	91	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.192	4.184	1/1	777981	32	>100:1	Target = 1.79		5000.00	5371.54		M
584 > 526	60	4.183	4.184		430020	33	>100:1	1.80 (0.89-2.69)	0.18				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	0	152142	15	>100:1			1000.00	1013.82	104.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.292	0/0	735620	15	>100:1			5000.00	5090.17		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	59517	14	>100:1			1000.00	1000.65	98	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/0	318306	14	>100:1	Target = 1.04		5000.00	5273.86		
512 > 219	57	4.301	4.301		280020	15	>100:1	1.13 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	723636	18	>100:1			1000.00	997.98	90.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	3315371	18	>100:1	Target = 7.82		5000.00	4799.67		
613 > 169	38	4.443	4.443		435245	18	>100:1	7.61 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.677	4.677	1/0	1421192	17	>100:1	Target = 3.35		5000.00	4931.21		
663 > 169	38	4.677	4.677		434415	16	>100:1	3.27 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	140112	17	>100:1			1000.00	977.34	103.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	563246	17	>100:1			5000.00	4935.69		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	65234	20	>100:1			1000.00	1135.62	127.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	282520	16	>100:1	Target = 1.06		5000.00	4124.83		
526 > 219	59	4.473	4.473		256606	15	>100:1	1.10 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	756525	18	>100:1			1000.00	956.64	87.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	3039266	18	>100:1	Target = 9.29		5000.00	4940.90		
713 > 169	42	4.889	4.889		341460	18	>100:1	8.90 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.253	5.253	1	382712	17	>100:1			1000.00	939.74	99.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/0	3047641	18	>100:1	Target = 13.38		5000.00	4952.90		
813 > 269	40	5.253	5.253		225642	16	>100:1	13.50 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.584	5.584	1/0	2299161	21	>100:1	Target = 106.35		5000.00	5057.93		
913 > 319	40	5.584	5.584		22943	19	>100:1	100.21 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.885	3.878	1	682214	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	774741	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	819629	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	844857	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.536	3.537	0	211005	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221023.d
Injection Date: 22-Jul-2021 17:42:28 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 8 Auto Sampler: 8
Sample Info: ICAL 10000_SVLC-1552 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.705	0	986222	19	>100:1			1000.00	1062.93	98.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/1	9725960	19	>100:1			10000	9658.30		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	998859	16	>100:1			1000.00	1034.89	94.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	9654204	15	>100:1			10000	9693.26		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	305059	15	>100:1			1000.00	1072.55	102.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	3432613	14	>100:1	Target = 3.65		8840.00	8172.02		
298.9 > 99	44	2.108	2.118		986212	15	>100:1	3.48 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/0	2866618	18	>100:1	Target = 3.30		9380.00	9201.23		
349 > 99	44	2.458	2.457		862905	17	>100:1	3.32 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	246085	17	>100:1			5000.00	5360.08	116.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.380	2.379	1/1	747459	17	>100:1	Target = 1.50		9340.00	8613.45		
327 > 81	63	2.388	2.379		498892	18	>100:1	1.49 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	865011	16	>100:1			1000.00	1021.96	100.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	8525978	18	>100:1	Target = 16.42		10000	10294		
313 > 119	49	2.423	2.422		494307	19	>100:1	17.24 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.545	2.544	1	772914	17	>100:1			5000.00	5441.59	119.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.545	2.544	1/0	2392542	18	>100:1	Target = 0.77		20000	19336		
285 > 185	66	2.536	2.544		2965195	17	>100:1	0.80 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	902828	18	>100:1			1000.00	1016.91	87	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/0	7952483	17	>100:1	Target = 3.14		10000	9933.55		
363 > 169	47	2.801	2.800		2685223	17	>100:1	2.96 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	271798	17	>100:1			1000.00	1081.87	103.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	1/0	2653504	26	>100:1	Target = 3.31	0.19	9100.00	8714.34		
399 > 99	45	2.818	2.818		791406	25	>100:1	3.35 (1.66-4.98)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	0/-1	12750418	18	>100:1	Target = 2.54		9420.00	8994.28		
377 > 85	45	2.836	2.844		5254040	18	>100:1	2.42 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.185	3.183	1/0	2282303	20	>100:1	Target = 3.57		9520.00	8682.23		
449 > 99	45	3.185	3.183		678055	21	>100:1	3.36 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.147	3.145	1	193621	21	>100:1			5000.00	5221.13	108.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.153	3.152	1/0	648315	21	>100:1	Target = 1.48		9480.00	8857.05		
427 > 81	64	3.153	3.152		417967	21	>100:1	1.55 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.172	3.177	0	900970	22	>100:1			1000.00	1054.89	90.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.178	3.177	1/1	8509896	22	>100:1	Target = 2.75		10000	9689.05		
413 > 169	53	3.172	3.177		2986594	21	>100:1	2.84 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.545	3.537	1	231281	21	>100:1			1000.00	1083.67	101.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.545	3.537	1/0	2275179	40	>100:1	Target = 3.90	0.27	9280.00	9205.53		
499 > 99	54	3.545	3.537		557303	42	>100:1	4.08 (1.95-5.85)	0.11				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.744	3.742	1/0	5971931	19	>100:1			9320.00	9312.03		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.873	3.871	1/0	1750676	18	>100:1	Target = 3.46		9600.00	8693.81		
549 > 99	54	3.873	3.871		539416	19	>100:1	3.24 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.168	4.159	1/0	2081221	17	>100:1	Target = 3.36		9640.00	9701.16		
599 > 99	54	4.160	4.159		621400	16	>100:1	3.34 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.321	4.320	1/0	5275723	15	>100:1			9420.00	9190.33		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.655	4.646	1/0	1962861	16	>100:1	Target = 3.51		9680.00	9847.79		
699 > 99	54	4.655	4.646		579811	16	>100:1	3.38 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.545	3.544	1	888521	20	>100:1			1000.00	1003.89	93.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.552	3.544	1/0	7402131	20	>100:1	Target = 4.84		10000	9818.16		
463 > 169	56	3.545	3.544		1565286	19	>100:1	4.72 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.850	3.848	1	419164	18	>100:1			1000.00	1045.48	107	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.850	3.856	0/-1	3804017	17	>100:1	Target = 42.34		10000	9181.97		
498>478	55	3.858	3.856		101366	18	>100:1	37.52 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.873	3.871	1	152175	19	>100:1			5000.00	5329.03	115.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.873	3.871	1/0	431373	18	>100:1	Target = 1.37		9580.00	9151.24		
527 > 81	65	3.880	3.871		298544	19	>100:1	1.44 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.457	4.449	1/0	623269	18	>100:1	Target = 2.23		9640.00	9554.72		
627 > 80	65	4.457	4.449		267643	18	>100:1	2.32 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.880	3.878	1	701602	18	>100:1			1000.00	976.10	85.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.880	3.878	1/0	6631896	18	>100:1	Target = 11.16		10000	10414		
513 > 169	51	3.880	3.878		614054	17	>100:1	10.80 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.032	4.030	1	1005789	15	>100:1			5000.00	5617.78	116.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.032	4.030	1/0	1468554	32	>100:1	Target = 1.39	0.08	10000	9909.17		M
570 > 483	58	4.032	4.030		1002352	32	>100:1	1.46 (0.69-2.09)	0.17				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.185	4.176	1	674178	17	>100:1			1000.00	1002.48	90.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.185	4.184	1/0	5658194	17	>100:1	Target = 10.79		10000	9342.39		
563 > 169	52	4.185	4.184		577180	16	>100:1	9.80 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.185	4.184	1	799413	17	>100:1			5000.00	4936.38	96.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.193	4.184	1/0	1565364	33	>100:1	Target = 1.79		10000	10209		M
584 > 526	60	4.193	4.184		896352	32	>100:1	1.74 (0.89-2.69)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.283	4.283	1	153861	15	>100:1			1000.00	1025.27	105.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.293	4.292	1/0	1516844	14	>100:1			10000	10379		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.302	4.301	1	60790	14	>100:1			1000.00	1022.06	100.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.301	1/0	640711	13	69:1	Target = 1.04		10000	10393		M
512 > 219	57	4.302	4.301		588703	14	>100:1	1.08 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	757890	18	>100:1			1000.00	1045.23	95	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	6912677	18	>100:1	Target = 7.82		10000	9555.20		
613 > 169	38	4.443	4.443		952698	17	>100:1	7.25 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.678	4.677	1/0	3094443	17	>100:1	Target = 3.35		10000	10252		
663 > 169	38	4.678	4.677		918355	17	>100:1	3.36 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	161978	17	>100:1			1000.00	1129.86	119.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	1227780	17	>100:1			10000	9306.56		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	59020	17	>100:1			1000.00	1027.45	115.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	623934	16	>100:1	Target = 1.06		10000	10069		
526 > 219	59	4.473	4.473		600553	15	>100:1	1.03 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.890	4.889	1	793769	18	>100:1			1000.00	1003.73	91.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.890	4.889	1/0	6276856	19	>100:1	Target = 9.29		10000	9725.42		
713 > 169	42	4.890	4.889		720124	17	>100:1	8.71 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.256	5.253	1	448927	16	>100:1			1000.00	1102.33	117.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.256	5.253	1/0	6701987	17	>100:1	Target = 13.38		10000	9285.30		
813 > 269	40	5.256	5.253		481254	18	>100:1	13.92 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.587	5.584	1/0	5195213	21	>100:1	Target = 106.35		10000	9743.24		
913 > 319	40	5.587	5.584		45807	21	>100:1	113.41 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.880	3.878	1	670924	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	866085	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.178	3.171	1	876260	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	915770	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.545	3.537	1	218690	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221024.d
Injection Date: 22-Jul-2021 17:53:04 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 9 Auto Sampler: 9
Sample Info: ICAL 15000_SVLC-1553 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	803630	20	>100:1			1000.00	866.14	80.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/0	11941390	19	>100:1			15000	14553		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	844615	16	>100:1			1000.00	875.08	79.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	11828789	15	>100:1			15000	14046		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	254183	15	>100:1			1000.00	893.68	85.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	4654585	15	>100:1	Target = 3.65		13260	13299		
298.9 > 99	44	2.108	2.118		1261118	15	>100:1	3.69 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.449	2.457	0/-1	3614434	19	>100:1	Target = 3.30		14070	13924		
349 > 99	44	2.458	2.457		1031350	17	>100:1	3.50 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	196732	19	>100:1			5000.00	4285.11	93.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.380	2.379	1/1	901427	18	>100:1	Target = 1.50		14010	12994		
327 > 81	63	2.388	2.379		596572	19	>100:1	1.51 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	728114	18	>100:1			1000.00	860.22	84.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	10345236	18	>100:1	Target = 16.42		15000	14839		
313 > 119	49	2.423	2.422		609061	19	>100:1	16.98 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	0	618211	17	>100:1			5000.00	4352.43	95.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.536	2.544	0/0	2790466	19	>100:1	Target = 0.77		30000	28196		
285 > 185	66	2.536	2.544		3779386	18	>100:1	0.73 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	769716	18	>100:1			1000.00	866.98	74.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/0	9861805	18	>100:1	Target = 3.14		15000	14449		
363 > 169	47	2.801	2.800		2921469	18	>100:1	3.37 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	219474	20	>100:1			1000.00	873.60	83.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.810	2.818	0/-1	3206971	27	>100:1	Target = 3.31	0.19	13650	13043		
399 > 99	45	2.810	2.818		978650	23	>100:1	3.27 (1.66-4.98)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	0/-1	15206440	18	>100:1	Target = 2.54		14130	13284		
377 > 85	45	2.836	2.844		6400115	18	>100:1	2.37 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	0/-1	2892307	21	>100:1	Target = 3.57		14280	13626		
449 > 99	45	3.183	3.183		788280	22	>100:1	3.66 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	151905	21	>100:1			5000.00	4096.23	84.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	0/-1	873787	21	>100:1	Target = 1.48		14220	15256		
427 > 81	64	3.151	3.152		516435	21	>100:1	1.69 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	0	696627	21	>100:1			1000.00	815.63	70.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.183	3.177	1/1	10439518	23	>100:1	Target = 2.75		15000	15373		
413 > 169	53	3.177	3.177		3807115	21	>100:1	2.74 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	182378	19	>100:1			1000.00	854.54	80.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.543	3.537	1/0	2824511	40	>100:1	Target = 3.90	0.08	13920	14505		M
499 > 99	54	3.543	3.537		653398	38	>100:1	4.32 (1.95-5.85)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.748	3.742	1/0	7585684	21	>100:1			13980	15000		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.878	3.871	1/0	2217287	18	>100:1	Target = 3.46		14400	13963		
549 > 99	54	3.871	3.871		661600	18	>100:1	3.35 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.167	4.159	1/0	2337455	16	>100:1	Target = 3.36		14460	13817		
599 > 99	54	4.167	4.159		745290	17	>100:1	3.13 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.320	4.320	0/-1	6637468	15	>100:1			14130	14663		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.655	4.646	1/0	2368181	17	>100:1	Target = 3.51		14520	15067		
699 > 99	54	4.655	4.646		689079	17	>100:1	3.43 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	0	696083	20	>100:1			1000.00	786.46	72.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.550	3.544	1/1	9066152	19	>100:1	Target = 4.84		15000	15350		
463 > 169	56	3.550	3.544		2018368	19	>100:1	4.49 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.856	3.848	1	341573	18	>100:1			1000.00	851.95	87.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.856	0/-1	4887849	18	>100:1	Target = 42.34		15000	14478		
498>478	55	3.856	3.856		122324	19	>100:1	39.95 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.878	3.871	1	111540	26	>100:1			5000.00	3906.03	84.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.878	3.871	1/0	545063	18	>100:1	Target = 1.37		14370	15776		
527 > 81	65	3.878	3.871		360661	19	>100:1	1.51 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.457	4.449	1/0	757812	18		Target = 2.23		14460	15850		
627 > 80	65	4.450	4.449		313863	18	>100:1	2.41 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.886	3.878	1	558988	19	>100:1			1000.00	777.69	67.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.886	3.878	1/0	7858528	18	>100:1	Target = 11.16		15000	15489		
513 > 169	51	3.886	3.878		751393	17	>100:1	10.45 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	0	824966	16	>100:1			5000.00	4607.80	95.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.040	4.030	1/1	1779252	33	>100:1	Target = 1.39	0.09	15000	14637		M
570 > 483	58	4.040	4.030		1246347	32	>100:1	1.42 (0.69-2.09)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.184	4.176	1	556901	16	>100:1			1000.00	828.09	75.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.184	4.184	0/-1	7389633	16	>100:1	Target = 10.79		15000	14771		
563 > 169	52	4.184	4.184		694600	16	>100:1	10.63 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.184	4.184	0	667341	17	>100:1			5000.00	4120.83	80.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.192	4.184	1/1	1907754	35	>100:1	Target = 1.79		15000	14904		M
584 > 526	60	4.192	4.184		1072850	32	>100:1	1.77 (0.89-2.69)	0.23				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	0	138826	15	>100:1			1000.00	925.08	95.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.292	0/0	1920503	14	>100:1			15000	14564		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	48965	15	>100:1			1000.00	823.24	80.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/0	816492	14	89:1	Target = 1.04		15000	16443		
512 > 219	57	4.301	4.301		740112	14	99:1	1.10 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	623624	18				1000.00	860.06	78.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	8328230	17	>100:1	Target = 7.82		15000	13990		
613 > 169	38	4.443	4.443		1132885	18	>100:1	7.35 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.677	4.677	1/0	3656987	18	>100:1	Target = 3.35		15000	14724		
663 > 169	38	4.677	4.677		1083408	17	>100:1	3.37 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	133831	15	>100:1			1000.00	933.52	98.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	1543972	17	>100:1			15000	14165		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	50322	17	>100:1			1000.00	876.03	98.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	790697	15	>100:1	Target = 1.06		15000	14965		
526 > 219	59	4.473	4.473		713955	15	>100:1	1.10 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	657461	19	>100:1			1000.00	831.37	76.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	7652488	19	>100:1	Target = 9.29		15000	14315		
713 > 169	42	4.889	4.889		845104	17	>100:1	9.05 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.254	5.253	1	352028	16	>100:1			1000.00	864.40	91.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.262	5.253	1/0	7943950	17	>100:1	Target = 13.38		15000	14035		
813 > 269	40	5.254	5.253		599915	18	>100:1	13.24 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.592	5.584	1/0	6480679	21	>100:1	Target = 106.35		15000	15500		
913 > 319	40	5.585	5.584		57473	20	>100:1	112.76 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.886	3.878	1	549041	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	681533	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	719647	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	769676	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	179156	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221025.d		
Injection Date:	22-Jul-2021 18:03:42	Injection Vol:	10.0 uL
Sample Type:	Ical, Level: 10	Auto Sampler:	10
Sample Info:	ICAL 20000_SVLC-1554	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	810258	19	>100:1			1000.00	873.28	81.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/0	16016213	20	>100:1			20000	19359		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	813509	16	>100:1			1000.00	842.86	76.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	16123551	15	>100:1			20000	19877		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	250392	15	>100:1			1000.00	880.35	84.3	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	6182232	16	>100:1	Target = 3.65		17680	17931		
298.9 > 99	44	2.108	2.118		1622554	15	>100:1	3.81 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.457	2.457	1/0	4753712	18	>100:1	Target = 3.30		18760	18590		
349 > 99	44	2.457	2.457		1431520	17	>100:1	3.32 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.379	2.388	0	203589	24	>100:1			5000.00	4434.46	96.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.379	1/1	1331305	17	>100:1	Target = 1.50		18680	18544		
327 > 81	63	2.388	2.379		758161	17	>100:1	1.75 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	718849	18	>100:1			1000.00	849.28	83.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	13460105	17	>100:1	Target = 16.42		20000	19555		
313 > 119	49	2.423	2.422		862340	18	>100:1	15.60 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.544	2.544	1	625061	18	>100:1			5000.00	4400.66	96.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.544	2.544	1/0	3810893	18	>100:1	Target = 0.77		40000	38084		
285 > 185	66	2.544	2.544		5248810	18	>100:1	0.72 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.800	2.800	1	748313	17	>100:1			1000.00	842.87	72.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.800	2.800	1/0	13044212	17	>100:1	Target = 3.14		20000	19658		
363 > 169	47	2.800	2.800		4171507	17	>100:1	3.12 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	208898	18	>100:1			1000.00	831.50	79.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	1/0	4109022	27	>100:1	Target = 3.31	0.20	18200	17558		
399 > 99	45	2.818	2.818		1259694	23	>100:1	3.26 (1.66-4.98)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.844	2.844	1/0	20445575	18	>100:1	Target = 2.54		18840	18765		
377 > 85	45	2.844	2.844		8406538	18	>100:1	2.43 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.189	3.183	1/0	3897064	22	>100:1	Target = 3.57		19040	19289		
449 > 99	45	3.183	3.183		1112797	22	>100:1	3.50 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	160346	21	>100:1			5000.00	4323.85	89.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	0/-1	1097727	22	>100:1	Target = 1.48		18960	18167		
427 > 81	64	3.151	3.152		712271	21	>100:1	1.54 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.183	3.177	1	673180	21	>100:1			1000.00	788.18	67.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.183	3.177	1/0	13682377	22	>100:1	Target = 2.75		20000	20850		
413 > 169	53	3.176	3.177		5133029	22	>100:1	2.66 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	186054	20	>100:1			1000.00	871.76	81.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.550	3.537	1/0	3887077	38	>100:1	Target = 3.90	0.27	18560	19575		
499 > 99	54	3.543	3.537		990835	39	>100:1	3.92 (1.95-5.85)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.748	3.742	1/0	10007484	20	>100:1			18640	19398		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.878	3.871	1/0	2866368	19	>100:1	Target = 3.46		19200	17694		
549 > 99	54	3.878	3.871		872999	17	>100:1	3.28 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.167	4.159	1/0	3185276	17	>100:1	Target = 3.36		19280	18457		
599 > 99	54	4.167	4.159		990718	16	>100:1	3.21 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.319	4.320	0/-1	8990127	15	>100:1			18840	19468		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.654	4.646	1/0	3080009	16	>100:1	Target = 3.51		19360	19209		
699 > 99	54	4.654	4.646		923524	16	>100:1	3.33 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.550	3.544	1	759834	19	>100:1			1000.00	858.49	79.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.550	3.544	1/0	12553626	19	>100:1	Target = 4.84		20000	19471		
463 > 169	56	3.550	3.544		2672590	20	>100:1	4.69 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	335466	18	>100:1			1000.00	836.72	85.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/-1	6970346	18	>100:1	Target = 42.34		20000	21022		
498>478	55	3.855	3.856		169348	17	>100:1	41.15 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.878	3.871	1	119826	26	>100:1			5000.00	4196.19	90.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.878	3.871	1/0	746356	20	>100:1	Target = 1.37		19160	20108		
527 > 81	65	3.878	3.871		483730	18	>100:1	1.54 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.456	4.449	1/0	1058795	17	>100:1	Target = 2.23		19280	20613		
627 > 80	65	4.456	4.449		445015	18	>100:1	2.37 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.885	3.878	1	603997	18	>100:1			1000.00	840.31	73.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.885	3.878	1/0	10392733	18	>100:1	Target = 11.16		20000	18957		
513 > 169	51	3.885	3.878		1030857	18	>100:1	10.08 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.039	4.030	1	840979	17	>100:1			5000.00	4697.24	97.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.039	4.030	1/0	2438414	33	>100:1	Target = 1.39	0.09	20000	19678		M
570 > 483	58	4.039	4.030		1685479	32	>100:1	1.44 (0.69-2.09)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.183	4.176	1	543337	16	>100:1			1000.00	807.92	73.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.183	4.184	0/-1	9765698	17	>100:1	Target = 10.79		20000	20007		
563 > 169	52	4.183	4.184		941733	16	>100:1	10.36 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.191	4.184	1	683075	18	>100:1			5000.00	4217.99	82.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.191	4.184	1/0	2564622	34	>100:1	Target = 1.79	0.07	20000	19574		M
584 > 526	60	4.191	4.184		1404675	31	>100:1	1.82 (0.89-2.69)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	0	140708	15	>100:1			1000.00	937.62	96.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.292	0/0	2593223	15	>100:1			20000	19402		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	57338	15	>100:1			1000.00	964.02	94.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/0	1107415	14	86:1	Target = 1.04		20000	19046		
512 > 219	57	4.310	4.301		972096	14	>100:1	1.13 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	618693	17	>100:1			1000.00	853.26	77.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.449	4.443	1/0	11032454	17	>100:1	Target = 7.82		20000	18681		
613 > 169	38	4.443	4.443		1483788	17	>100:1	7.43 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.677	4.677	1/0	5129262	17	>100:1	Target = 3.35		20000	20816		
663 > 169	38	4.677	4.677		1447920	17	>100:1	3.54 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	132021	16	>100:1			1000.00	920.90	97.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	2144442	17	>100:1			20000	19943		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	1	54500	16	>100:1			1000.00	948.76	106.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	1116884	16	>100:1	Target = 1.06		20000	19518		
526 > 219	59	4.473	4.473		986356	16	>100:1	1.13 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	673974	17	>100:1			1000.00	852.25	78	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	10184487	18	>100:1	Target = 9.29		20000	18585		
713 > 169	42	4.889	4.889		1136360	17	>100:1	8.96 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.253	5.253	1	333663	16	>100:1			1000.00	819.30	87	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.262	5.253	1/0	10389813	18	>100:1	Target = 13.38		20000	19367		
813 > 269	40	5.262	5.253		800180	17	>100:1	12.98 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.591	5.584	1/0	8791541	21	>100:1	Target = 106.35		20000	22184		
913 > 319	40	5.591	5.584		74809	21	>100:1	117.51 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.885	3.878	1	567636	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	696333	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.183	3.171	1	730605	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	784926	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.550	3.537	1	191479	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221026.d		
Injection Date:	22-Jul-2021 18:14:21	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	100
Lab Sample ID:	ID BLK C1	Lab Prep. Batch:	
Sample Info:	ID BLK C1	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	971179	20	>100:1			1001.00	1046.72	97.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.705		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	971278	15	>100:1			1001.00	1006.32	91.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.055		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	285670	15	>100:1			1001.00	1004.38	96.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.118		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/0	1290	21	8.2:1	Target = 3.07		4.4261	4.4261		
349 > 99	44	2.458	2.457		429	11	5.9:1	3.00 (1.53-4.61)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	1	238098	19	>100:1			5005.00	5186.12	113	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.379		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	891400	17	>100:1			1001.00	1053.14	103.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.422		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	0	760882	17	>100:1			5005.00	5356.89	117.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.544		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	878747	18	>100:1			1001.00	989.78	84.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.800		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	261478	19	>100:1			1001.00	1040.79	99.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	1/0	2224	27	11:1	Target = 3.46	0.17	7.5997	7.5997		
399 > 99	45	2.827	2.818		1069	38	3.7:1	2.08 (1.73-5.19)	0.85				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.844		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.183		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	196246	21	>100:1			5005.00	5291.91	109.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.152		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	0	890840	22	>100:1			1001.00	1043.03	89.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.177		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	194853	19	>100:1			1001.00	912.99	85.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.537		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.748	3.742	1/0	2899	21	17:1			5.3709	5.3709		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.871		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.159		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.329	4.320	1/0	2099	15	17:1			4.3444	4.3444		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.647	4.646	1/0	791	12	8.4:1	Target = 3.46		4.7151	4.7151		
699 > 99	54	4.662	4.646		191	16		4.14 (1.73-5.20)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.550	3.544	1	872484	19	>100:1			1001.00	985.77	91.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.544		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	441424	18	>100:1			1001.00	1101.00	112.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.856		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.878	3.871	1	153533	18	>100:1			5005.00	5376.58	116.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.871		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.449		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.885	3.878	1	763351	19	>100:1			1001.00	1062.01	92.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.885	3.878	1/0	4816	17	9.2:1	Target = 9.46		6.9578	6.9578		
513 > 169	51	3.885	3.878		877	12	5.8:1	5.49 (4.73-14.20)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	0	994636	15	>100:1			5005.00	5555.49	115.3	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.030		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.183	4.176	1	729280	16	>100:1			1001.00	1084.41	98.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.184		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.183	4.184	0	883776	16	>100:1			5005.00	5457.32	106.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.200	4.184	1/1	1849	39	8.7:1	Target = 2.06	0.22	10.918	10.918		
584 > 526	60	4.208	4.184		956	51	4.5:1	1.93 (1.03-3.09)	0.46				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	0	161025	15	>100:1			1001.00	1073.01	110.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.292		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	61068	15	>100:1			1001.00	1026.73	100.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.301		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	797646	17	>100:1			1001.00	1100.05	99.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.443		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.677		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	151038	16	>100:1			1001.00	1053.55	111.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.456		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	61947	16	>100:1			1001.00	1078.40	121.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.473		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	769023	18	>100:1			1001.00	972.44	89	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	3377	13	8.5:1	Target = 9.19		5.4061	5.4061		
713 > 169	42	4.889	4.889		489	17	4.5:1	6.90 (4.59-13.79)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.262	5.253	1	425362	16	>100:1			1001.00	1044.47	111	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.262	5.253	1/0	11675	15	15:1	Target = 13.88		17.088	17.088		
813 > 269	40	5.270	5.253		1019	21	10:1	11.45 (6.94-20.83)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.599	5.584	1/0	7331	17	6.7:1	Target = 106.53		14.525	14.525		
913 > 319	40	5.606	5.584		92	22	6.1:1	79.68 (53.26-159.80)					
*** 37 13C2_PFDA**													
515 > 470		3.885	3.878	1	800450	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	832373	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.183	3.171	1	1005472	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	1004313	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.550	3.537	1	272655	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221027.d
Injection Date: 22-Jul-2021 18:25:03 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1577 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	434.90	87	70 - 130
D 46 13C4_PFBA	997866	1043858			104.6	50 - 150
D 50 13C5_PFPeA	1059542	1138873			107.5	50 - 150
21 PFPeA			500.00	417.42	83.5	70 - 130
D 44 13C3_PFBS	297147	333161			112.1	50 - 150
7 PFBS			442.50	347.02	78.4	70 - 130
1 4:2 FTS			467.50	436.57	93.4	70 - 130
D 63 13C2_4:2 FTS_2	210753	235252			111.6	50 - 150
D 49 13C5_PFHxA	864384	977773			113.1	50 - 150
15 PFHxA			500.00	397.81	79.6	70 - 130
22 PFPeS			470.00	391.57	83.3	70 - 130
28 GenX			2500.00	2236.47	89.5	70 - 130
D 66 13C3_GenX	649017	753194			116.1	50 - 150
D 47 13C4_PFHpA	1037869	1016453			97.9	50 - 150
13 PFHpA			500.00	419.55	83.9	70 - 130
D 45 13C3_PFHxS	261903	274511			104.8	50 - 150
14 PFHxS			456.00	386.30	84.7	70 - 130
29 ADONA			2355.00	2486.63	105.6	70 - 130
D 64 13C2_6:2 FTS_2	179008	198935			111.1	50 - 150
2 6:2 FTS			475.00	391.15	82.3	70 - 130
20 PFOA			500.00	444.49	88.9	70 - 130
D 53 13C8_PFOA	991369	1004348			101.3	50 - 150
12 PFHpS			475.00	411.84	86.7	70 - 130
18 PFOS			462.75	377.80	81.6	70 - 130
D 54 13C8_PFOS	227393	251056			110.4	50 - 150
17 PFNA			500.00	428.11	85.6	70 - 130
D 56 13C9_PFNA	954829	983209			103	50 - 150
30 9Cl-PF3ONS			2330.00	1867.02	80.1	70 - 130
D 55 13C8_PFOSA	391661	421050			107.5	50 - 150
19 PFOSA			500.00	457.72	91.5	70 - 130
16 PFNS			480.00	381.25	79.4	70 - 130
D 65 13C2_8:2 FTS_2	132148	130382			98.7	50 - 150
3 8:2 FTS			480.00	573.22	119.4	70 - 130
10 PFDA			500.00	369.04	73.8	70 - 130
D 51 13C6_PFDA	824029	880227			106.8	50 - 150
6 N-MeFOSAA			500.00	521.15	104.2	70 - 130

Report Date: 25-Jul-2021 09:47:46 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221027.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	862293	952420			110.5	50 - 150
9 PFDS			482.50	401.17	83.1	70 - 130
D 52 13C7_PFUdA	741490	718388			96.9	50 - 150
5 N-EtFOSAA			500.00	522.12	104.4	70 - 130
25 PFUdA			500.00	459.64	91.9	70 - 130
D 60 d5-EtFOSAA	830172	880794			106.1	50 - 150
D 61 d7-MeFOSE	145483	156107			107.3	50 - 150
D 57 d3-MeFOSA	60705	56017			92.3	50 - 150
31 11Cl-PF3OUDS			2355.00	1812.85	77	70 - 130
D 62 d9-EtFOSE	135458	150921			111.4	50 - 150
11 PFDoA			500.00	430.33	86.1	70 - 130
D 38 13C2_PFDoA	798101	837870			105	50 - 150
4 10:2 FTS			2410.00	3015.65	125.1	70 - 130
D 59 d5-EtFOSA	51036	64539			126.5	50 - 150
24 PFTrDA			500.00	407.06	81.4	70 - 130
23 PFTeDA			500.00	422.33	84.5	70 - 130
D 42 13C2_PFTeDA	864247	905318			104.8	50 - 150
D 40 13C2_PFHxDA	383301	446402			116.5	50 - 150

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221027.d
Injection Date: 22-Jul-2021 18:25:03 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1577 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	1043858	20	>100:1			1000.00	1125.05	104.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/0	463540	20	>100:1			500.00	434.90		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.055	1	1138873	15	>100:1			1000.00	1179.96	107.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.055	2.055	1/0	474019	15	>100:1			500.00	417.42		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	333161	15	>100:1			1000.00	1171.35	112.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	159190	16	>100:1	Target = 3.65		442.50	347.02		
298.9 > 99	44	2.108	2.118		46488	17	>100:1	3.42 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.457	2.457	1/0	133229	19	>100:1	Target = 3.30		470.00	391.57		
349 > 99	44	2.457	2.457		41963	18	>100:1	3.17 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	1	235252	19	>100:1			5000.00	5124.13	111.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.379	1/0	36217	16	>100:1	Target = 1.50		467.50	436.57		
327 > 81	63	2.388	2.379		23824	12	>100:1	1.52 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.422	2.422	1	977773	18	>100:1			1000.00	1155.18	113.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.422	2.422	1/0	372444	18	>100:1	Target = 16.42		500.00	397.81		
313 > 119	49	2.422	2.422		22851	18	>100:1	16.29 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.544	2.544	1	753194	19	>100:1			5000.00	5302.76	116.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.544	2.544	1/0	269667	19	>100:1	Target = 0.77		2500.00	2236.47		
285 > 185	66	2.544	2.544		336938	17	>100:1	0.80 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.800	2.800	1	1016453	18	>100:1			1000.00	1144.89	97.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.800	2.800	1/0	378146	17	>100:1	Target = 3.14		500.00	419.55		
363 > 169	47	2.800	2.800		122378	17	>100:1	3.08 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	274511	19	>100:1			1000.00	1092.67	104.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	1/0	118802	26	>100:1	Target = 3.31	0.18	456.00	386.30		
399 > 99	45	2.818	2.818		31131	23	>100:1	3.81 (1.66-4.98)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.844	2.844	1/0	3560274	18	>100:1	Target = 2.54		2355.00	2486.63		
377 > 85	45	2.835	2.844		1081224	18	>100:1	3.29 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.185	3.183	1/0	109340	20	>100:1	Target = 3.57		475.00	411.84		
449 > 99	45	3.185	3.183		32832	18	>100:1	3.33 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.153	3.145	1	198935	21	>100:1			5000.00	5364.43	111.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.153	3.152	1/0	33422	29	>100:1	Target = 1.48		475.00	391.15		
427 > 81	64	3.153	3.152		22695	26	>100:1	1.47 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.179	3.177	1	1004348	21	>100:1			1000.00	1175.92	101.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.179	3.177	1/0	435190	22	>100:1	Target = 2.75		500.00	444.49		
413 > 169	53	3.179	3.177		145919	20	>100:1	2.98 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.545	3.537	1	251056	20	>100:1			1000.00	1176.33	110.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.545	3.537	1/0	106881	40	>100:1	Target = 3.90	0.23	462.75	377.80		M
499 > 99	54	3.545	3.537		27316	37	>100:1	3.91 (1.95-5.85)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.744	3.742	1/0	1299720	21	>100:1			2330.00	1867.02		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.873	3.871	1/0	83336	18	>100:1	Target = 3.46		480.00	381.25		M
549 > 99	54	3.881	3.871		27516	20	>100:1	3.02 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.169	4.159	1/0	93423	14	>100:1	Target = 3.36		482.50	401.17		
599 > 99	54	4.169	4.159		25230	15	>100:1	3.70 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.321	4.320	1/0	1129648	15	>100:1			2355.00	1812.85		
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.552	3.544	1	983209	20	>100:1			1000.00	1110.87	103	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.552	3.544	1/0	357155	19	>100:1	Target = 4.84		500.00	428.11		
463 > 169	56	3.552	3.544		74169	19	>100:1	4.81 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.858	3.848	1	421050	17	>100:1			1000.00	1050.18	107.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.858	3.856	1/0	190481	18	>100:1	Target = 42.34		500.00	457.72		
498>478	55	3.851	3.856		6115	22	39:1	31.14 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.873	3.871	1	130382	18	>100:1			5000.00	4565.85	98.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.873	3.871	1/0	23151	14	>100:1	Target = 1.37		480.00	573.22		M
527 > 81	65	3.881	3.871		16334	20	>100:1	1.41 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.458	4.449	1/0	168544	18	>100:1	Target = 2.23		2410.00	3015.65		
627 > 80	65	4.458	4.449		70363	17	>100:1	2.39 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.888	3.878	1	880227	18	>100:1			1000.00	1224.61	106.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.888	3.878	1/0	294848	17	>100:1	Target = 11.16		500.00	369.04		
513 > 169	51	3.896	3.878		28466	22	95:1	10.35 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.033	4.030	1	952420	15	>100:1			5000.00	5319.69	110.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.043	4.030	1/0	73137	17	>100:1	Target = 1.39		500.00	521.15		
570 > 483	58	4.043	4.030		49762	16	>100:1	1.46 (0.69-2.09)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.185	4.176	1	718388	16	>100:1			1000.00	1068.21	96.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.185	4.184	1/0	296638	16	>100:1	Target = 10.79		500.00	459.64		
563 > 169	52	4.185	4.184		27165	14	>100:1	10.91 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.185	4.184	1	880794	16	>100:1			5000.00	5438.90	106.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.193	4.184	1/0	88209	15	>100:1	Target = 1.79		500.00	522.12		
584 > 526	60	4.193	4.184		47259	16	>100:1	1.86 (0.89-2.69)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.284	4.283	1	156107	16	>100:1			1000.00	1040.24	107.3	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.303	4.301	1	56017	14	>100:1			1000.00	941.81	92.3	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.451	4.443	1	837870	18	>100:1			1000.00	1155.53	105	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.444	4.443	1/0	344171	17	>100:1	Target = 7.82		500.00	430.33		
613 > 169	38	4.444	4.443		52909	17	>100:1	6.50 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.678	4.677	1/0	135837	19	>100:1	Target = 3.35		500.00	407.06		
663 > 169	38	4.678	4.677		41407	15	>100:1	3.28 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.444	4.443	1	150921	22	>100:1			1000.00	1052.73	111.4	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.466	4.464	1	64539	16	>100:1			1000.00	1123.52	126.5	
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.890	4.889	1	905318	18	>100:1			1000.00	1144.79	104.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.890	4.889	1/0	310878	18	>100:1	Target = 9.29		500.00	422.33		
713 > 169	42	4.890	4.889		33571	18	>100:1	9.26 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.256	5.253	1	446402	16	>100:1			1000.00	1096.13	116.5	
*** 37 13C2_PFDA**													
515 > 470		3.888	3.878	1	673993	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.422	2.422	1	811230	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.179	3.171	1	911504	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	912690	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.545	3.537	1	247106	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221028.d
Injection Date: 22-Jul-2021 18:35:36 Injection Vol: 10.0 uL
Sample Type: CheckStd Auto Sampler: 12
Sample Info: ISOMERS_SVLC-1562 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: IsomerCheck Conc. Level: Smp Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.705	0	992143	20	>100:1			1000.00	1069.31	99.4	
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	1025325	16	>100:1			1000.00	1062.31	96.8	
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	307999	16	>100:1			1000.00	1082.89	103.7	
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	260383	18	>100:1			5000.00	5671.52	123.5	
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	960616	18	>100:1			1000.00	1134.91	111.1	
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.545	2.544	1	772114	18	>100:1			5000.00	5435.96	119	
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	907077	18	>100:1			1000.00	1021.69	87.4	
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	282629	24	>100:1			1000.00	1124.98	107.9	
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.158	3.145	1	187901	21	>100:1			5000.00	5066.89	105	
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	0	920016	21	>100:1			1000.00	1077.19	92.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.183	3.177	1/1	10917480	35	>100:1	Target = 2.62	0.15	10000	12173		
413 > 169	53	3.183	3.177		4216192	35	>100:1	2.58 (1.31-3.93)	0.22				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	240127	19	>100:1			1000.00	1125.12	105.6	
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.550	3.544	1	970742	19	>100:1			1000.00	1096.78	101.7	
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	432147	17	>100:1			1000.00	1077.86	110.3	
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.878	3.871	1	168716	18	>100:1			5000.00	5908.28	127.7	
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.885	3.878	1	790702	18	>100:1			1000.00	1100.06	96	
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.039	4.030	1	969177	16	>100:1			5000.00	5413.29	112.4	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.039	4.030	1/0	2097042	34	>100:1	Target = 1.42	0.09	10000	14684		M
570 > 483	58	4.039	4.030		1462840	31	>100:1	1.43 (0.71-2.13)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.183	4.176	1	759521	16	>100:1			1000.00	1129.38	102.4	
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.192	4.184	1	959731	17	>100:1			5000.00	5926.34	115.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.192	4.184	1/0	2409147	34	>100:1	Target = 2.06		10000	13087		M
584 > 526	60	4.192	4.184		1308344	32	>100:1	1.84 (1.03-3.09)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.283	1	182829	14	>100:1			1000.00	1218.30	125.7	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	63406	14	>100:1			1000.00	1066.04	104.4	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.450	4.443	1	911403	17	>100:1			1000.00	1256.94	114.2	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	149762	17	>100:1			1000.00	1044.65	110.6	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	58664	17	>100:1			1000.00	1021.25	114.9	
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	890978	18	>100:1			1000.00	1126.65	103.1	
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.262	5.253	1	474626	16	>100:1			1000.00	1165.43	123.8	
*** 37 13C2_PFDA**													
515 > 470		3.885	3.878	1	736856	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	856220	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	912580	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	964103	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	238021	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521005.d
Injection Date: 15-Jul-2021 11:48:36 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	960189	1113527			116	50 - 150
8 PFBA			100.00	100.97	101	70 - 130
D 50 13C5_PFPeA	979583	1149706			117.4	50 - 150
21 PFPeA			100.00	97.681	97.7	70 - 130
7 PFBS			88.400	89.960	101.8	70 - 130
D 44 13C3_PFBS	316591	323186			102.1	50 - 150
1 4:2 FTS			93.400	97.841	104.8	70 - 130
D 63 13C2_4:2 FTS_2	251776	315070			125.1	50 - 150
D 49 13C5_PFHxA	862788	1021493			118.4	50 - 150
15 PFHxA			100.00	91.836	91.8	70 - 130
22 PFPeS			93.800	90.454	96.4	70 - 130
28 GenX			200.00	228.36	114.2	70 - 130
D 66 13C3_GenX	897310	656369			73.1	50 - 150
D 47 13C4_PFHpA	907666	1044534			115.1	50 - 150
13 PFHpA			100.00	98.534	98.5	70 - 130
D 45 13C3_PFHxS	303002	288464			95.2	50 - 150
14 PFHxS			91.000	84.700	93.1	70 - 130
29 ADONA			94.200	100.09	106.2	70 - 130
D 64 13C2_6:2 FTS_2	244810	256829			104.9	50 - 150
2 6:2 FTS			94.800	135.97	143.4	70 - 130
20 PFOA			100.00	104.86	104.9	70 - 130
D 53 13C8_PFOA	921507	944865			102.5	50 - 150
12 PFHpS			95.200	97.339	102.2	70 - 130
18 PFOS			92.800	92.513	99.7	70 - 130
D 54 13C8_PFOS	232494	236731			101.8	50 - 150
17 PFNA			100.00	104.71	104.7	70 - 130
D 56 13C9_PFNA	901596	974663			108.1	50 - 150
30 9Cl-PF3ONS			93.200	95.395	102.4	70 - 130
D 55 13C8_PFOSA	459073	436170			95	50 - 150
19 PFOSA			100.00	101.66	101.7	70 - 130
16 PFNS			96.000	118.28	123.2	70 - 130
D 65 13C2_8:2 FTS_2	168869	198400			117.5	50 - 150
3 8:2 FTS			95.800	99.201	103.5	70 - 130
10 PFDA			100.00	92.590	92.6	70 - 130
D 51 13C6_PFDA	831393	884006			106.3	50 - 150
6 N-MeFOSAA			100.00	108.38	108.4	70 - 130

Report Date: 18-Jul-2021 15:54:13 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS01.i\071521-DOD.b\071521005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	941259	1047631			111.3	50 - 150
9 PFDS			96.400	99.589	103.3	70 - 130
25 PFUdA			100.00	97.311	97.3	70 - 130
5 N-EtFOSAA			100.00	100.89	100.9	70 - 130
D 60 d5-EtFOSAA	956597	933947			97.6	50 - 150
D 52 13C7_PFUdA	803090	794481			98.9	50 - 150
D 61 d7-MeFOSE	176335	139728			79.2	50 - 150
32 MeFOSE			100.00	103.61	103.6	70 - 130
26 MeFOSA			100.00	99.472	99.5	70 - 130
D 57 d3-MeFOSA	62206	59067			95	50 - 150
31 11Cl-PF3OUDS			94.200	83.318	88.4	70 - 130
D 62 d9-EtFOSE	156993	128491			81.8	50 - 150
33 EtFOSE			100.00	112.51	112.5	70 - 130
D 59 d5-EtFOSA	64110	56042			87.4	50 - 150
27 EtFOSA			100.00	99.108	99.1	70 - 130
11 PFDoA			100.00	100.14	100.1	70 - 130
D 38 13C2_PFDoA	788291	774066			98.2	50 - 150
4 10:2 FTS			96.400	118.34	122.8	70 - 130
34 PFDOS			96.800	101.34	104.7	70 - 130
24 PFTrDA			100.00	94.090	94.1	70 - 130
23 PFTeDA			100.00	97.787	97.8	70 - 130
D 42 13C2_PFTeDA	844286	796198			94.3	50 - 150
D 40 13C2_PFHxDA	524461	451058			86	50 - 150
35 PFHxDA			100.00	103.27	103.3	70 - 130
36 PFODA			100.00	88.928	88.9	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521005.d
Injection Date: 15-Jul-2021 11:48:36 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.702	1.702	0	1113527	22	>100:1			1000.00	1203.07	116	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.708	0/0	113922	20	37:1			100.00	100.97		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	0	1149706	17	>100:1			1000.00	1213.07	117.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	-1/-1	112048	16	>100:1			100.00	97.681		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	-1	323186	17	>100:1			1000.00	1065.21	102.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.120	-1/0	40189	18	>100:1	Target = 3.79		88.400	89.960		
298.9 > 99	44	2.120	2.120		12550	20	75:1	3.20 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	-1/0	29744	21	>100:1	Target = 3.30		93.800	90.454		
349 > 99	44	2.476	2.476		9345	17	68:1	3.18 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	-1	315070	20	>100:1			5000.00	6880.13	125.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	0/1	10835	27	59:1	Target = 1.48		93.400	97.841		
327 > 81	63	2.407	2.398		7987	11	49:1	1.35 (0.74-2.22)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	-1	1021493	20	>100:1			1000.00	1222.25	118.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	-1/0	90856	17	84:1	Target = 16.51		100.00	91.836		
313 > 119	49	2.441	2.441		6667	16	33:1	13.62 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	-1	656369	21	>100:1			5000.00	3968.77	73.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	-1/0	20922	15	>100:1	Target = 0.69		200.00	228.36		
285 > 185	66	2.563	2.563		28913	18	>100:1	0.72 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.828	2.828	-1	1044534	20	>100:1			1000.00	1157.11	115.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.828	2.828	-2/-1	94331	20	>100:1	Target = 3.47		100.00	98.534		
363 > 169	47	2.828	2.828		30826	20	94:1	3.06 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.846	-1	288464	20	>100:1			1000.00	1062.52	95.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.846	0/1	27163	31	>100:1	Target = 3.30	0.14	91.000	84.700		
399 > 99	45	2.846	2.846		9384	22	45:1	2.89 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.863	-2/-1	146261	20	>100:1	Target = 2.54		94.200	100.09		
377 > 85	45	2.863	2.863		58348	21	>100:1	2.50 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.223	3.223	-2/-1	27555	24	>100:1	Target = 3.54		95.200	97.339		
449 > 99	45	3.229	3.223		9811	29	75:1	2.80 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.191	3.191	-2	256829	25	>100:1			5000.00	5782.00	104.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.191	3.191	-2/0	18460	28	89:1	Target = 1.46		94.800	135.97		
427 > 81	64	3.198	3.191		10413	20	55:1	1.77 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.217	3.217	-2	944865	21	>100:1			1000.00	1053.30	102.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.217	3.217	-2/0	99167	22	63:1	Target = 2.72		100.00	104.86		
413 > 169	53	3.217	3.217		35745	20	>100:1	2.77 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.588	3.588	-3	236731	20	>100:1			1000.00	1039.55	101.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.595	3.595	0/3	28829	44	67:1	Target = 3.88	0.20	92.800	92.513		M
499 > 99	54	3.595	3.595		7142	35	40:1	4.03 (1.94-5.83)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.797	3.797	-3/0	64820	20	>100:1			93.200	95.395		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.924	3.924	-2/1	23677	24	78:1	Target = 3.09		96.000	118.28		
549 > 99	54	3.924	3.924		6302	13		3.75 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.226	4.226	-2/1	23366	21	>100:1	Target = 3.32		96.400	99.589		
599 > 99	54	4.235	4.226		6574	23	32:1	3.55 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.382	4.382	-3/0	50568	15	>100:1			94.200	83.318		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.725	4.725	-2/1	21007	20	>100:1	Target = 3.35		96.800	101.34		
699 > 99	54	4.719	4.725		5719	28	73:1	3.67 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.603	3.603	-2	974663	21	>100:1			1000.00	1095.87	108.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.595	3.595	-3/-1	86569	39	>100:1	Target = 4.81		100.00	104.71		
463 > 169	56	3.595	3.595		18222	20	91:1	4.75 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.886	3.886	-2	436170	19	>100:1			1000.00	967.85	95	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.878	3.878	-3/-1	45183	25	70:1	Target = 40.56		100.00	101.66		
498>478	55	3.871	3.878		1091	11		41.41 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.931	3.931	-3	198400	19	>100:1			5000.00	6086.53	117.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.924	3.924	-4/-1	6361	18		Target = 1.50		95.800	99.201		
527 > 81	65	3.939	3.924		4545	16		1.39 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.530	4.530	-1/2	9296	23	61:1	Target = 2.24		96.400	118.34		
627 > 80	65	4.521	4.530		3816	20	39:1	2.43 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.939	3.939	-3	884006	21	>100:1			1000.00	1165.84	106.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.939	3.939	-3/0	74489	19	>100:1	Target = 9.65		100.00	92.590		
513 > 169	51	3.931	3.939		8300	18	63:1	8.97 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.093	-2	1047631	19	>100:1			5000.00	5239.53	111.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.093	4.093	0/2	17449	33	62:1	Target = 1.47	0.11	100.00	108.38		M
570 > 483	58	4.093	4.093		11254	31	42:1	1.55 (0.73-2.21)	0.16				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.254	4.254	-2	933947	19	>100:1			5000.00	5200.55	97.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.254	4.254	0/2	18823	40	>100:1	Target = 1.78	0.08	100.00	100.89		M
584 > 526	60	4.263	4.254		9826	36	59:1	1.91 (0.89-2.67)	0.14				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.245	4.245	-2	794481	17	>100:1			1000.00	1063.07	98.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.245	4.245	-2/0	68241	19	>100:1	Target = 9.77		100.00	97.311		
563 > 169	52	4.245	4.245		7946	21	29:1	8.58 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.301	4.301	-2	139728	15	>100:1			1000.00	803.74	79.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.310	4.310	-2/0	13036	15	31:1			100.00	103.61		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.319	4.319	-2	59067	16	>100:1			1000.00	948.72	95	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.319	4.319	0/2	6224	9	19:1	Target = 1.18		100.00	99.472		M
512 > 219	57	4.338	4.319		6805	13	36:1	0.91 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.456	4.456	-3	128491	18	>100:1			1000.00	811.02	81.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.472	4.472	-3/0	12095	14	28:1			100.00	112.51		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.481	-2	56042	17	>100:1			1000.00	918.05	87.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.489	4.489	-3/-1	5766	15	30:1	Target = 1.11		100.00	99.108		
526 > 219	59	4.489	4.489		7335	17	33:1	0.78 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.513	4.513	-2	774066	20	>100:1			1000.00	999.82	98.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.513	-2/0	74588	17	52:1	Target = 7.48		100.00	100.14		
613 > 169	38	4.513	4.513		8866	16	27:1	8.41 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.750	4.750	-3/-1	30892	23	>100:1	Target = 3.23		100.00	94.090		
663 > 169	38	4.744	4.750		8238	18	94:1	3.74 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.972	4.972	-2	796198	20	>100:1			1000.00	963.18	94.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.972	4.972	-2/0	62604	17	42:1	Target = 8.62		100.00	97.787		
713 > 169	42	4.972	4.972		6101	17	66:1	10.26 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.356	5.356	-2	451058	19	>100:1			1000.00	883.92	86	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.356	5.356	-2/0	71673	19	8.9:1	Target = 12.71		100.00	103.27		
813 > 269	40	5.356	5.356		6361	21	>100:1	11.26 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.722	5.722	-3/-1	48513	24	>100:1	Target = 113.87		100.00	88.928		
913 > 319	40	5.715	5.722		543	23	60:1	89.34 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.939	3.939	-3	870350	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	-1	920665	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.217	3.217	-2	986438	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.708	0	1062574	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.595	3.595	-2	259036	22	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521006.d
Injection Date: 15-Jul-2021 11:59:07 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1113527	1089891			97.9	50 - 150
8 PFBA			200.00	210.48	105.2	70 - 130
D 50 13C5_PFPeA	1149706	1108492			96.4	50 - 150
21 PFPeA			200.00	208.37	104.2	70 - 130
7 PFBS			176.80	167.07	94.5	70 - 130
D 44 13C3_PFBS	323186	330006			102.1	50 - 150
1 4:2 FTS			186.80	200.55	107.4	70 - 130
D 63 13C2_4:2 FTS_2	315070	288412			91.5	50 - 150
D 49 13C5_PFHxA	1021493	946372			92.6	50 - 150
15 PFHxA			200.00	213.65	106.8	70 - 130
22 PFPeS			187.60	170.83	91.1	70 - 130
28 GenX			400.00	561.29	140.3	70 - 130
D 66 13C3_GenX	656369	629907			96	50 - 150
D 47 13C4_PFHpA	1044534	1001339			95.9	50 - 150
13 PFHpA			200.00	190.93	95.5	70 - 130
D 45 13C3_PFHxS	288464	287052			99.5	50 - 150
14 PFHxS			182.00	198.01	108.8	70 - 130
29 ADONA			188.40	203.43	108	70 - 130
D 64 13C2_6:2 FTS_2	256829	256067			99.7	50 - 150
2 6:2 FTS			189.60	241.58	127.4	70 - 130
20 PFOA			200.00	210.49	105.2	70 - 130
D 53 13C8_PFOA	944865	977697			103.5	50 - 150
12 PFHpS			190.40	193.62	101.7	70 - 130
18 PFOS			185.60	184.78	99.6	70 - 130
D 54 13C8_PFOS	236731	237135			100.2	50 - 150
17 PFNA			200.00	213.76	106.9	70 - 130
D 56 13C9_PFNA	974663	963233			98.8	50 - 150
30 9Cl-PF3ONS			186.40	193.12	103.6	70 - 130
D 55 13C8_PFOSA	436170	434032			99.5	50 - 150
19 PFOSA			200.00	198.51	99.3	70 - 130
16 PFNS			192.00	219.87	114.5	70 - 130
D 65 13C2_8:2 FTS_2	198400	200849			101.2	50 - 150
3 8:2 FTS			191.60	221.74	115.7	70 - 130
10 PFDA			200.00	175.65	87.8	70 - 130
D 51 13C6_PFDA	884006	862032			97.5	50 - 150
6 N-MeFOSAA			200.00	220.03	110	70 - 130

Report Date: 18-Jul-2021 15:54:14 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS01.i\071521-DOD.b\071521006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1047631	1017925			97.2	50 - 150
9 PFDS			192.80	203.17	105.4	70 - 130
25 PFUdA			200.00	203.25	101.6	70 - 130
5 N-EtFOSAA			200.00	185.27	92.6	70 - 130
D 60 d5-EtFOSAA	933947	993580			106.4	50 - 150
D 52 13C7_PFUdA	794481	759927			95.7	50 - 150
D 61 d7-MeFOSE	139728	139167			99.6	50 - 150
32 MeFOSE			200.00	220.03	110	70 - 130
26 MeFOSA			200.00	223.91	112	70 - 130
D 57 d3-MeFOSA	59067	61634			104.3	50 - 150
31 11Cl-PF3OUDS			188.40	187.33	99.4	70 - 130
D 62 d9-EtFOSE	128491	136932			106.6	50 - 150
33 EtFOSE			200.00	172.19	86.1	70 - 130
D 59 d5-EtFOSA	56042	49734			88.7	50 - 150
27 EtFOSA			200.00	225.95	113	70 - 130
11 PFDoA			200.00	195.00	97.5	70 - 130
D 38 13C2_PFDoA	774066	790786			102.2	50 - 150
4 10:2 FTS			192.80	197.96	102.7	70 - 130
34 PFDOS			193.60	195.16	100.8	70 - 130
24 PFTrDA			200.00	185.13	92.6	70 - 130
23 PFTeDA			200.00	202.34	101.2	70 - 130
D 42 13C2_PFTeDA	796198	770811			96.8	50 - 150
D 40 13C2_PFHxDA	451058	431911			95.8	50 - 150
35 PFHxDA			200.00	217.65	108.8	70 - 130
36 PFODA			200.00	174.09	87	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521006.d
Injection Date: 15-Jul-2021 11:59:07 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.702	1	1089891	22	>100:1			1000.00	1177.53	97.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.708	1/0	232445	23	94:1			200.00	210.48		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	1108492	18	>100:1			1000.00	1169.59	96.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	1/0	230452	18	>100:1			200.00	208.37		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	1	330006	17	>100:1			1000.00	1087.68	102.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.120	1/0	76213	18	>100:1	Target = 3.79		176.80	167.07		
298.9 > 99	44	2.120	2.120		19770	17	>100:1	3.85 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	1/0	57358	20	>100:1	Target = 3.30		187.60	170.83		
349 > 99	44	2.468	2.476		18665	19	>100:1	3.07 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	1	288412	20	>100:1			5000.00	6298.00	91.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	1/0	20330	19	>100:1	Target = 1.48		186.80	200.55		
327 > 81	63	2.398	2.398		17151	22	74:1	1.18 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.441	1	946372	21	>100:1			1000.00	1132.37	92.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.441	1/0	195828	23	>100:1	Target = 16.51		200.00	213.65		
313 > 119	49	2.442	2.441		11054	20	47:1	17.71 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	629907	20	>100:1			5000.00	3808.77	96	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	1/0	49350	20	>100:1	Target = 0.69		400.00	561.29		
285 > 185	66	2.554	2.563		62210	28	>100:1	0.79 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.829	2.828	1	1001339	20	>100:1			1000.00	1109.26	95.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.829	2.828	1/0	175230	18	>100:1	Target = 3.47		200.00	190.93		
363 > 169	47	2.829	2.828		55273	18	>100:1	3.17 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.846	1	287052	21	>100:1			1000.00	1057.32	99.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.846	1/0	63191	31	>100:1	Target = 3.30	0.08	182.00	198.01		M
399 > 99	45	2.846	2.846		17717	28	>100:1	3.56 (1.65-4.95)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.863	1/0	295833	22	>100:1	Target = 2.54		188.40	203.43		
377 > 85	45	2.873	2.863		111477	23	>100:1	2.65 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.227	3.223	1/0	54543	24	>100:1	Target = 3.54		190.40	193.62		
449 > 99	45	3.227	3.223		15370	26	>100:1	3.54 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.189	3.191	0	256067	25	>100:1			5000.00	5764.84	99.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.189	3.191	0/0	27865	30	82:1	Target = 1.46		189.60	241.58		
427 > 81	64	3.195	3.191		20715	25	98:1	1.34 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.214	3.217	0	977697	25	>100:1			1000.00	1089.90	103.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.221	3.217	1/1	205985	30	>100:1	Target = 2.72		200.00	210.49		
413 > 169	53	3.214	3.217		76485	24	>100:1	2.69 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.591	3.588	1	237135	22	>100:1			1000.00	1041.32	100.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.599	3.595	1/0	52862	40	>100:1	Target = 3.88	0.28	185.60	184.78		M
499 > 99	54	3.599	3.595		12480	40	>100:1	4.23 (1.94-5.83)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.795	3.797	0/-1	131447	20	>100:1			186.40	193.12		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.929	3.924	1/0	44087	19	>100:1	Target = 3.09		192.00	219.87		
549 > 99	54	3.929	3.924		13826	16		3.18 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.232	4.226	1/0	47749	19	>100:1	Target = 3.32		192.80	203.17		
599 > 99	54	4.232	4.226		11693	21	93:1	4.08 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.379	4.382	0/-1	113890	18	>100:1			188.40	187.33		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.717	4.725	0/-1	40526	27	>100:1	Target = 3.35		193.60	195.16		
699 > 99	54	4.723	4.725		10874	23	>100:1	3.72 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.599	3.603	0	963233	22	>100:1			1000.00	1083.02	98.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.599	3.595	1/1	174656	21	>100:1	Target = 4.81		200.00	213.76		
463 > 169	56	3.591	3.595		36330	23	>100:1	4.80 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.884	3.886	0	434032	21	>100:1			1000.00	963.11	99.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.884	3.878	1/1	87792	19	>100:1	Target = 40.56		200.00	198.51		
498>478	55	3.891	3.878		2664	20	10:1	32.95 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.929	3.931	0	200849	21				5000.00	6161.66	101.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.945	3.924	2/2	14394	16	79:1	Target = 1.50		191.60	221.74		M
527 > 81	65	3.937	3.924		8976	18	28:1	1.60 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.518	4.530	0/0	15742	39		Target = 2.24		192.80	197.96		
627 > 80	65	4.527	4.530		5836	25	47:1	2.69 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.937	3.939	0	862032	21	>100:1			1000.00	1136.86	97.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.945	3.939	1/1	137798	20	>100:1	Target = 9.65		200.00	175.65		
513 > 169	51	3.945	3.939		15456	20	73:1	8.91 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.093	1	1017925	19	>100:1			5000.00	5090.96	97.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.090	4.093	0/-1	34420	34	>100:1	Target = 1.47	0.09	200.00	220.03		M
570 > 483	58	4.098	4.093		21716	31	>100:1	1.58 (0.73-2.21)	0.25				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.251	4.254	0	993580	18	>100:1			5000.00	5532.61	106.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.251	4.254	0/0	36772	36	>100:1	Target = 1.78	0.07	200.00	185.27		M
584 > 526	60	4.251	4.254		18642	33	>100:1	1.97 (0.89-2.67)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.251	4.245	1	759927	18	>100:1			1000.00	1016.84	95.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.241	4.245	0/-1	136333	17	>100:1	Target = 9.77		200.00	203.25		
563 > 169	52	4.251	4.245		11618	22	53:1	11.73 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.297	4.301	0	139167	18	>100:1			1000.00	800.51	99.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.307	4.310	0/0	27573	20	72:1			200.00	220.03		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.316	4.319	0	61634	17	>100:1			1000.00	989.95	104.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.325	4.319	-2/-2	14619	16	59:1	Target = 1.18		200.00	223.91		
512 > 219	57	4.316	4.319		10716	16	44:1	1.36 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.461	4.456	1	136932	18	>100:1			1000.00	864.30	106.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.469	4.472	0/-1	19726	19	73:1			200.00	172.19		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.486	4.481	1	49734	19	>100:1			1000.00	814.72	88.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.494	4.489	1/0	11666	17	64:1	Target = 1.11		200.00	225.95		
526 > 219	59	4.486	4.489		11750	16	65:1	0.99 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.510	4.513	0	790786	18	>100:1			1000.00	1021.41	102.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.510	4.513	0/0	148388	21	78:1	Target = 7.48		200.00	195.00		
613 > 169	38	4.518	4.513		19619	24	>100:1	7.56 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.748	4.750	0/0	62094	22	>100:1	Target = 3.23		200.00	185.13		
663 > 169	38	4.748	4.750		16932	24	>100:1	3.66 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.968	4.972	0	770811	19	>100:1			1000.00	932.47	96.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.968	4.972	0/0	125411	19	23:1	Target = 8.62		200.00	202.34		
713 > 169	42	4.959	4.972		12938	17	>100:1	9.69 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.351	5.356	0	431911	19	>100:1			1000.00	846.40	95.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.351	5.356	0/0	144649	21	19:1	Target = 12.71		200.00	217.65		
813 > 269	40	5.351	5.356		10549	18	>100:1	13.71 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.732	5.722	1/1	90938	24	11:1	Target = 113.87		200.00	174.09		
913 > 319	40	5.725	5.722		956	31	35:1	95.12 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.937	3.939	0	797170	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.441	1	904739	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.217	1	1029403	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.702	1.708	0	1042844	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.591	3.595	0	244897	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521011.d
Injection Date: 15-Jul-2021 12:51:59 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 2
Sample Info: CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1113527	1072952			96.4	50 - 150
8 PFBA			1000.00	912.38	91.2	70 - 130
D 50 13C5_PFPeA	1149706	1100325			95.7	50 - 150
21 PFPeA			1000.00	917.51	91.8	70 - 130
7 PFBS			884.00	814.59	92.1	70 - 130
D 44 13C3_PFBS	323186	318210			98.5	50 - 150
1 4:2 FTS			934.00	1011.37	108.3	70 - 130
D 63 13C2_4:2 FTS_2	315070	271886			86.3	50 - 150
D 49 13C5_PFHxA	1021493	936493			91.7	50 - 150
15 PFHxA			1000.00	912.11	91.2	70 - 130
22 PFPeS			938.00	866.72	92.4	70 - 130
28 GenX			2000.00	2412.18	120.6	70 - 130
D 66 13C3_GenX	656369	609197			92.8	50 - 150
D 47 13C4_PFHpA	1044534	1007765			96.5	50 - 150
13 PFHpA			1000.00	857.36	85.7	70 - 130
D 45 13C3_PFHxS	288464	294137			102	50 - 150
14 PFHxS			910.00	733.86	80.6	70 - 130
29 ADONA			942.00	896.08	95.1	70 - 130
D 64 13C2_6:2 FTS_2	256829	236040			91.9	50 - 150
2 6:2 FTS			948.00	997.51	105.2	70 - 130
20 PFOA			1000.00	872.34	87.2	70 - 130
D 53 13C8_PFOA	944865	983349			104.1	50 - 150
12 PFHpS			952.00	780.41	82	70 - 130
18 PFOS			928.00	808.73	87.1	70 - 130
D 54 13C8_PFOS	236731	241000			101.8	50 - 150
17 PFNA			1000.00	1127.54	112.8	70 - 130
D 56 13C9_PFNA	974663	870636			89.3	50 - 150
30 9Cl-PF3ONS			932.00	821.10	88.1	70 - 130
D 55 13C8_PFOSA	436170	395659			90.7	50 - 150
19 PFOSA			1000.00	982.42	98.2	70 - 130
16 PFNS			960.00	977.97	101.9	70 - 130
D 65 13C2_8:2 FTS_2	198400	178478			90	50 - 150
3 8:2 FTS			958.00	957.74	100	70 - 130
10 PFDA			1000.00	935.86	93.6	70 - 130
D 51 13C6_PFDA	884006	805423			91.1	50 - 150
6 N-MeFOSAA			1000.00	1054.68	105.5	70 - 130

Report Date: 18-Jul-2021 15:54:21 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521011.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1047631	910088			86.9	50 - 150
9 PFDS			964.00	805.78	83.6	70 - 130
25 PFUdA			1000.00	1025.67	102.6	70 - 130
5 N-EtFOSAA			1000.00	1026.90	102.7	70 - 130
D 60 d5-EtFOSAA	933947	865025			92.6	50 - 150
D 52 13C7_PFUdA	794481	711330			89.5	50 - 150
D 61 d7-MeFOSE	139728	127136			91	50 - 150
32 MeFOSE			1000.00	1055.70	105.6	70 - 130
26 MeFOSA			1000.00	963.98	96.4	70 - 130
D 57 d3-MeFOSA	59067	57949			98.1	50 - 150
31 11Cl-PF3OUDS			942.00	806.30	85.6	70 - 130
D 62 d9-EtFOSE	128491	110822			86.2	50 - 150
33 EtFOSE			1000.00	1097.56	109.8	70 - 130
D 59 d5-EtFOSA	56042	53205			94.9	50 - 150
27 EtFOSA			1000.00	1035.78	103.6	70 - 130
11 PFDoA			1000.00	859.85	86	70 - 130
D 38 13C2_PFDoA	774066	757278			97.8	50 - 150
4 10:2 FTS			964.00	927.34	96.2	70 - 130
34 PFDOS			968.00	856.30	88.5	70 - 130
24 PFTrDA			1000.00	829.33	82.9	70 - 130
23 PFTeDA			1000.00	938.30	93.8	70 - 130
D 42 13C2_PFTeDA	796198	731462			91.9	50 - 150
D 40 13C2_PFHxDA	451058	356726			79.1	50 - 150
35 PFHxDA			1000.00	1079.73	108	70 - 130
36 PFODA			1000.00	984.33	98.4	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521011.d
Injection Date: 15-Jul-2021 12:51:59 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 2
Sample Info: CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.702	1.702	0	1072952	23	>100:1			1000.00	1159.23	96.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.708	0/0	991934	22	>100:1			1000.00	912.38		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	0	1100325	18	>100:1			1000.00	1160.97	95.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	0/0	1007261	17	>100:1			1000.00	917.51		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	0	318210	17	>100:1			1000.00	1048.81	98.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.120	0/0	358309	16	>100:1	Target = 3.79		884.00	814.59		
298.9 > 99	44	2.120	2.120		96472	18	>100:1	3.71 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	0/0	280615	19	>100:1	Target = 3.30		938.00	866.72		
349 > 99	44	2.476	2.476		86449	20	>100:1	3.24 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	271886	19	>100:1			5000.00	5937.13	86.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	0/0	96649	19	>100:1	Target = 1.48		934.00	1011.37		
327 > 81	63	2.398	2.398		66325	22	>100:1	1.45 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	0	936493	19	>100:1			1000.00	1120.55	91.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	0/0	827288	22	>100:1	Target = 16.51		1000.00	912.11		
313 > 119	49	2.441	2.441		50144	19	>100:1	16.49 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	0	609197	22	>100:1			5000.00	3683.54	92.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	0/0	205113	22	>100:1	Target = 0.69		2000.00	2412.18		
285 > 185	66	2.563	2.563		252261	20	>100:1	0.81 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.828	2.828	0	1007765	22	>100:1			1000.00	1116.38	96.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.828	2.828	0/0	791890	20	>100:1	Target = 3.47		1000.00	857.36		
363 > 169	47	2.828	2.828		243878	20	>100:1	3.24 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.846	0	294137	21	>100:1			1000.00	1083.42	102	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.846	0/0	239976	27	>100:1	Target = 3.30	0.16	910.00	733.86		
399 > 99	45	2.846	2.846		79970	30	>100:1	3.00 (1.65-4.95)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.863	0/0	1335230	21	>100:1	Target = 2.54		942.00	896.08		
377 > 85	45	2.863	2.863		502013	22	>100:1	2.65 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.223	3.223	0/0	225265	25	>100:1	Target = 3.54		952.00	780.41		
449 > 99	45	3.223	3.223		63373	23	>100:1	3.55 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.185	3.191	0	236040	27	>100:1			5000.00	5313.98	91.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.191	3.191	0/0	88103	22	>100:1	Target = 1.46		948.00	997.51		
427 > 81	64	3.185	3.191		59907	24	>100:1	1.47 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.217	3.217	0	983349	25	>100:1			1000.00	1096.20	104.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.217	3.217	0/0	858608	26	>100:1	Target = 2.72		1000.00	872.34		
413 > 169	53	3.210	3.217		321720	23	>100:1	2.66 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.588	3.588	0	241000	22	>100:1			1000.00	1058.29	101.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.595	3.595	0/0	218547	45	>100:1	Target = 3.88	0.26	928.00	808.73		M
499 > 99	54	3.595	3.595		60135	44	>100:1	3.63 (1.94-5.83)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.797	3.797	0/0	567993	21	>100:1			932.00	821.10		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.923	3.924	0/0	199296	22	>100:1	Target = 3.09		960.00	977.97		
549 > 99	54	3.923	3.924		57020	19	>100:1	3.49 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.225	4.226	0/0	192465	16	>100:1	Target = 3.32		964.00	805.78		
599 > 99	54	4.225	4.226		60423	17		3.18 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.382	4.382	0/0	498191	19	>100:1			942.00	806.30		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.719	4.725	0/0	180711	19	>100:1	Target = 3.35		968.00	856.30		
699 > 99	54	4.719	4.725		54610	20	>100:1	3.30 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.602	3.603	0	870636	21	>100:1			1000.00	978.90	89.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.588	3.595	0/0	832719	21	>100:1	Target = 4.81		1000.00	1127.54		
463 > 169	56	3.595	3.595		150981	21	>100:1	5.51 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.886	3.886	0	395659	22	>100:1			1000.00	877.96	90.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.886	3.878	1/1	396071	19	>100:1	Target = 40.56		1000.00	982.42		
498>478	55	3.878	3.878		10382	26	61:1	38.14 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.931	3.931	0	178478	21				5000.00	5475.36	90	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.939	3.924	1/1	55246	21	>100:1	Target = 1.50		958.00	957.74		
527 > 81	65	3.931	3.924		36614	26	>100:1	1.50 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.521	4.530	0/0	65531	18	>100:1	Target = 2.24		964.00	927.34		
627 > 80	65	4.521	4.530		27291	25	>100:1	2.40 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.939	3.939	0	805423	21	>100:1			1000.00	1062.20	91.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.939	3.939	0/0	685974	20	>100:1	Target = 9.65		1000.00	935.86		
513 > 169	51	3.939	3.939		68084	21	>100:1	10.07 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.093	0	910088	18	>100:1			5000.00	4551.63	86.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.093	4.093	0/0	147505	36	>100:1	Target = 1.47	0.10	1000.00	1054.68		M
570 > 483	58	4.093	4.093		103412	32	>100:1	1.42 (0.73-2.21)	0.19				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.244	4.254	0	865025	19	>100:1			5000.00	4816.77	92.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.254	4.254	0/0	177449	36		Target = 1.78		1000.00	1026.90		M
584 > 526	60	4.254	4.254		90233	34	>100:1	1.96 (0.89-2.67)	0.22				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.244	4.245	0	711330	17	>100:1			1000.00	951.81	89.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.244	4.245	0/0	643990	18	>100:1	Target = 9.77		1000.00	1025.67		
563 > 169	52	4.244	4.245		65471	17	>100:1	9.83 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.300	4.301	0	127136	17	>100:1			1000.00	731.31	91	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.310	4.310	0/0	120857	17	>100:1			1000.00	1055.70		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.319	4.319	0	57949	19	>100:1			1000.00	930.76	98.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.328	4.319	1/1	59175	23	65:1	Target = 1.18		1000.00	963.98		
512 > 219	57	4.328	4.319		53277	16	96:1	1.11 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.464	4.456	1	110822	17	>100:1			1000.00	699.50	86.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.472	4.472	0/-1	101761	19	>100:1			1000.00	1097.56		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.489	4.481	1	53205	16	>100:1			1000.00	871.58	94.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.489	4.489	0/-1	57210	17	>100:1	Target = 1.11		1000.00	1035.78		
526 > 219	59	4.489	4.489		54049	17	>100:1	1.05 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.513	4.513	0	757278	18	>100:1			1000.00	978.13	97.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.513	0/0	626580	18	>100:1	Target = 7.48		1000.00	859.85		
613 > 169	38	4.513	4.513		87488	20	>100:1	7.16 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.750	4.750	0/0	266383	21	>100:1	Target = 3.23		1000.00	829.33		
663 > 169	38	4.744	4.750		83619	23	>100:1	3.18 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.965	4.972	0	731462	18	>100:1			1000.00	884.87	91.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.965	4.972	0/0	551865	19	97:1	Target = 8.62		1000.00	938.30		
713 > 169	42	4.965	4.972		61060	20	>100:1	9.03 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.347	5.356	0	356726	18	>100:1			1000.00	699.06	79.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.356	0/0	592677	18	66:1	Target = 12.71		1000.00	1079.73		
813 > 269	40	5.347	5.356		44746	20	>100:1	13.24 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.722	5.722	1/1	424683	24	61:1	Target = 113.87		1000.00	984.33		
913 > 319	40	5.715	5.722		4254	21	>100:1	99.83 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.939	3.939	0	774011	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	0	918979	21	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.217	3.217	0	947520	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.708	0	981069	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.580	3.595	0	256579	22	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521024.d
Injection Date: 15-Jul-2021 15:09:19 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 14
Sample Info: CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1113527	1233766			110.8	50 - 150
8 PFBA			1000.00	897.09	89.7	70 - 130
D 50 13C5_PFPeA	1149706	1265153			110	50 - 150
21 PFPeA			1000.00	880.52	88.1	70 - 130
7 PFBS			884.00	802.39	90.8	70 - 130
D 44 13C3_PFBS	323186	347635			107.6	50 - 150
1 4:2 FTS			934.00	954.24	102.2	70 - 130
D 63 13C2_4:2 FTS_2	315070	291757			92.6	50 - 150
D 49 13C5_PFHxA	1021493	1055568			103.3	50 - 150
15 PFHxA			1000.00	850.52	85.1	70 - 130
22 PFPeS			938.00	852.80	90.9	70 - 130
28 GenX			2000.00	2563.79	128.2	70 - 130
D 66 13C3_GenX	656369	636156			96.9	50 - 150
D 47 13C4_PFHpA	1044534	1100183			105.3	50 - 150
13 PFHpA			1000.00	924.05	92.4	70 - 130
D 45 13C3_PFHxS	288464	313879			108.8	50 - 150
14 PFHxS			910.00	819.36	90	70 - 130
29 ADONA			942.00	911.76	96.8	70 - 130
D 64 13C2_6:2 FTS_2	256829	264436			103	50 - 150
2 6:2 FTS			948.00	915.61	96.6	70 - 130
20 PFOA			1000.00	868.54	86.9	70 - 130
D 53 13C8_PFOA	944865	1075318			113.8	50 - 150
12 PFHpS			952.00	876.48	92.1	70 - 130
18 PFOS			928.00	798.05	86	70 - 130
D 54 13C8_PFOS	236731	272348			115	50 - 150
17 PFNA			1000.00	869.58	87	70 - 130
D 56 13C9_PFNA	974663	1094930			112.3	50 - 150
30 9Cl-PF3ONS			932.00	848.62	91.1	70 - 130
D 55 13C8_PFOSA	436170	427687			98.1	50 - 150
19 PFOSA			1000.00	1004.76	100.5	70 - 130
16 PFNS			960.00	886.39	92.3	70 - 130
D 65 13C2_8:2 FTS_2	198400	200250			100.9	50 - 150
3 8:2 FTS			958.00	910.16	95	70 - 130
10 PFDA			1000.00	914.35	91.4	70 - 130
D 51 13C6_PFDA	884006	893924			101.1	50 - 150
6 N-MeFOSAA			1000.00	984.47	98.4	70 - 130

Report Date: 18-Jul-2021 15:54:35 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521024.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1047631	1010730			96.5	50 - 150
9 PFDS			964.00	792.28	82.2	70 - 130
25 PFUdA			1000.00	870.05	87	70 - 130
5 N-EtFOSAA			1000.00	1024.53	102.5	70 - 130
D 60 d5-EtFOSAA	933947	954976			102.3	50 - 150
D 52 13C7_PFUdA	794481	868370			109.3	50 - 150
D 61 d7-MeFOSE	139728	147711			105.7	50 - 150
32 MeFOSE			1000.00	1041.12	104.1	70 - 130
26 MeFOSA			1000.00	1186.33	118.6	70 - 130
D 57 d3-MeFOSA	59067	54825			92.8	50 - 150
31 11Cl-PF3OUDS			942.00	785.39	83.4	70 - 130
D 62 d9-EtFOSE	128491	144872			112.7	50 - 150
33 EtFOSE			1000.00	903.65	90.4	70 - 130
D 59 d5-EtFOSA	56042	53375			95.2	50 - 150
27 EtFOSA			1000.00	1093.94	109.4	70 - 130
11 PFDoA			1000.00	909.11	90.9	70 - 130
D 38 13C2_PFDoA	774066	794269			102.6	50 - 150
4 10:2 FTS			964.00	779.06	80.8	70 - 130
34 PFDOS			968.00	809.17	83.6	70 - 130
24 PFTrDA			1000.00	796.94	79.7	70 - 130
23 PFTeDA			1000.00	921.90	92.2	70 - 130
D 42 13C2_PFTeDA	796198	816798			102.6	50 - 150
D 40 13C2_PFHxDA	451058	388734			86.2	50 - 150
35 PFHxDA			1000.00	1079.22	107.9	70 - 130
36 PFODA			1000.00	920.73	92.1	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521024.d
Injection Date: 15-Jul-2021 15:09:19 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 14
Sample Info: CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.702	1.702	1	1233766	21	>100:1			1000.00	1332.97	110.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.709	1.708	1/0	1121500	22	>100:1			1000.00	897.09		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	1265153	18	>100:1			1000.00	1334.88	110	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	1/0	1111453	18	>100:1			1000.00	880.52		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.121	2.120	1	347635	17	>100:1			1000.00	1145.79	107.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.121	2.120	1/0	385580	17	>100:1	Target = 3.79		884.00	802.39		
298.9 > 99	44	2.121	2.120		100272	17	>100:1	3.84 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.476	1/0	301639	19	>100:1	Target = 3.30		938.00	852.80		
349 > 99	44	2.477	2.476		85034	20	>100:1	3.54 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.390	2.398	0	291757	21	>100:1			5000.00	6371.05	92.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	1/1	97854	20	>100:1	Target = 1.48		934.00	954.24		
327 > 81	63	2.398	2.398		65350	20	>100:1	1.49 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.441	0	1055568	20	>100:1			1000.00	1263.02	103.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.441	1/1	869515	19	>100:1	Target = 16.51		1000.00	850.52		
313 > 119	49	2.442	2.441		51334	19	>100:1	16.93 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	636156	21	>100:1			5000.00	3846.55	96.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.555	2.563	0/-1	227652	20	>100:1	Target = 0.69		2000.00	2563.79		
285 > 185	66	2.555	2.563		279472	22	>100:1	0.81 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.829	2.828	1	1100183	20	>100:1			1000.00	1218.76	105.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.820	2.828	0/-1	931758	21	>100:1	Target = 3.47		1000.00	924.05		
363 > 169	47	2.829	2.828		276050	20	>100:1	3.37 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.838	2.846	0	313879	20	>100:1			1000.00	1156.13	108.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.838	2.846	0/0	285918	29	>100:1	Target = 3.30	0.16	910.00	819.36		
399 > 99	45	2.846	2.846		84312	29	>100:1	3.39 (1.65-4.95)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.863	1/1	1449794	21	>100:1	Target = 2.54		942.00	911.76		
377 > 85	45	2.864	2.863		557711	21	>100:1	2.59 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.221	3.223	0/0	269978	24	>100:1	Target = 3.54		952.00	876.48		
449 > 99	45	3.227	3.223		75103	25	>100:1	3.59 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.189	3.191	0	264436	28	>100:1			5000.00	5953.26	103	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.189	3.191	0/0	91126	24	>100:1	Target = 1.46		948.00	915.61		
427 > 81	64	3.189	3.191		62385	24	>100:1	1.46 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.221	3.217	1	1075318	23	>100:1			1000.00	1198.72	113.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.214	3.217	0/-1	934820	25	>100:1	Target = 2.72		1000.00	868.54		
413 > 169	53	3.221	3.217		344175	24	>100:1	2.71 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.591	3.588	1	272348	22	>100:1			1000.00	1195.95	115	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.591	3.595	0/-1	243787	41	>100:1	Target = 3.88	0.28	928.00	798.05		
499 > 99	54	3.591	3.595		63417	42	>100:1	3.84 (1.94-5.83)	0.11				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.795	3.797	0/-1	663386	23	>100:1			932.00	848.62		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.929	3.924	1/0	204129	20	>100:1	Target = 3.09		960.00	886.39		
549 > 99	54	3.929	3.924		63686	21	>100:1	3.20 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.222	4.226	0/-1	213855	19	>100:1	Target = 3.32		964.00	792.28		
599 > 99	54	4.232	4.226		70055	16	>100:1	3.05 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.388	4.382	1/0	548397	17	>100:1			942.00	785.39		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.717	4.725	0/-1	192977	20	>100:1	Target = 3.35		968.00	809.17		
699 > 99	54	4.717	4.725		56866	20		3.39 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.599	3.603	0	1094930	22	>100:1			1000.00	1231.09	112.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.599	3.595	1/1	807653	22	>100:1	Target = 4.81		1000.00	869.58		
463 > 169	56	3.599	3.595		159419	21	>100:1	5.06 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.891	3.886	1	427687	20	>100:1			1000.00	949.03	98.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.891	3.878	1/0	437868	20	>100:1	Target = 40.56		1000.00	1004.76		
498>478	55	3.884	3.878		12083	23	92:1	36.23 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.929	3.931	0	200250	20	>100:1			5000.00	6143.29	100.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.924	1/1	58906	19	>100:1	Target = 1.50		958.00	910.16		
527 > 81	65	3.929	3.924		38708	21	>100:1	1.52 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.519	4.530	0/0	61768	17	>100:1	Target = 2.24		964.00	779.06		
627 > 80	65	4.527	4.530		27813	17		2.22 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.945	3.939	1	893924	18	>100:1			1000.00	1178.92	101.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.945	3.939	1/0	743857	19	>100:1	Target = 9.65		1000.00	914.35		
513 > 169	51	3.937	3.939		76478	20	>100:1	9.72 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.090	4.093	0	1010730	19	>100:1			5000.00	5054.97	96.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.098	4.093	1/1	152912	33		Target = 1.47		1000.00	984.47		M
570 > 483	58	4.098	4.093		120094	34	>100:1	1.27 (0.73-2.21)	0.05				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.251	4.254	0	954976	18	>100:1			5000.00	5317.65	102.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.260	4.254	1/1	195449	36	>100:1	Target = 1.78		1000.00	1024.53		M
584 > 526	60	4.251	4.254		112684	33	>100:1	1.73 (0.89-2.67)	0.20				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.251	4.245	1	868370	18	>100:1			1000.00	1161.94	109.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.251	4.245	1/0	666884	18	>100:1	Target = 9.77		1000.00	870.05		
563 > 169	52	4.251	4.245		69638	18	>100:1	9.57 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.307	4.301	1	147711	15	>100:1			1000.00	849.66	105.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.316	4.310	1/0	138476	19	>100:1			1000.00	1041.12		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.325	4.319	1	54825	13	>100:1			1000.00	880.58	92.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.325	4.319	1/0	68898	21	47:1	Target = 1.18		1000.00	1186.33		
512 > 219	57	4.325	4.319		62903	16	>100:1	1.09 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.470	4.456	1	144872	21	>100:1			1000.00	914.42	112.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.478	4.472	1/0	109524	18	>100:1			1000.00	903.65		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.494	4.481	1	53375	19	>100:1			1000.00	874.36	95.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.494	4.489	1/0	60615	16	>100:1	Target = 1.11		1000.00	1093.94		
526 > 219	59	4.494	4.489		58923	18	>100:1	1.02 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.510	4.513	0	794269	18	>100:1			1000.00	1025.91	102.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.510	4.513	0/0	694832	19	>100:1	Target = 7.48		1000.00	909.11		
613 > 169	38	4.510	4.513		91658	21	>100:1	7.58 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.748	4.750	0/0	268483	20	>100:1	Target = 3.23		1000.00	796.94		
663 > 169	38	4.748	4.750		88981	22	>100:1	3.01 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.968	4.972	0	816798	20	>100:1			1000.00	988.10	102.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.968	4.972	0/0	605473	19	86:1	Target = 8.62		1000.00	921.90		
713 > 169	42	4.968	4.972		64137	19	>100:1	9.44 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.343	5.356	0	388734	19	>100:1			1000.00	761.79	86.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.352	5.356	0/0	645550	19	66:1	Target = 12.71		1000.00	1079.22		
813 > 269	40	5.352	5.356		49507	21	>100:1	13.03 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.718	5.722	0/0	432884	25	49:1	Target = 113.87		1000.00	920.73		
913 > 319	40	5.725	5.722		3733	21	>100:1	115.96 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.937	3.939	0	788167	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.441	1	916728	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.217	1	1079686	25	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.702	1.708	0	1092362	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.591	3.595	0	240475	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521034.d
Injection Date: 15-Jul-2021 16:55:05 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 23
Sample Info: CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1113527	1140870			102.5	50 - 150
8 PFBA			1000.00	930.12	93	70 - 130
D 50 13C5_PFPeA	1149706	1188025			103.3	50 - 150
21 PFPeA			1000.00	908.90	90.9	70 - 130
7 PFBS			884.00	738.51	83.5	70 - 130
D 44 13C3_PFBS	323186	359916			111.4	50 - 150
1 4:2 FTS			934.00	863.35	92.4	70 - 130
D 63 13C2_4:2 FTS_2	315070	337536			107.1	50 - 150
D 49 13C5_PFHxA	1021493	1041013			101.9	50 - 150
15 PFHxA			1000.00	890.35	89	70 - 130
22 PFPeS			938.00	834.94	89	70 - 130
28 GenX			2000.00	2543.25	127.2	70 - 130
D 66 13C3_GenX	656369	672778			102.5	50 - 150
D 47 13C4_PFHpA	1044534	1030895			98.7	50 - 150
13 PFHpA			1000.00	910.97	91.1	70 - 130
D 45 13C3_PFHxS	288464	306230			106.2	50 - 150
14 PFHxS			910.00	820.29	90.1	70 - 130
29 ADONA			942.00	960.20	101.9	70 - 130
D 64 13C2_6:2 FTS_2	256829	290442			113.1	50 - 150
2 6:2 FTS			948.00	907.87	95.8	70 - 130
20 PFOA			1000.00	968.71	96.9	70 - 130
D 53 13C8_PFOA	944865	989006			104.7	50 - 150
12 PFHpS			952.00	859.90	90.3	70 - 130
18 PFOS			928.00	882.14	95.1	70 - 130
D 54 13C8_PFOS	236731	262573			110.9	50 - 150
17 PFNA			1000.00	934.12	93.4	70 - 130
D 56 13C9_PFNA	974663	1004681			103.1	50 - 150
30 9Cl-PF3ONS			932.00	944.92	101.4	70 - 130
D 55 13C8_PFOSA	436170	424184			97.3	50 - 150
19 PFOSA			1000.00	996.57	99.7	70 - 130
16 PFNS			960.00	928.28	96.7	70 - 130
D 65 13C2_8:2 FTS_2	198400	208231			105	50 - 150
3 8:2 FTS			958.00	911.15	95.1	70 - 130
10 PFDA			1000.00	931.11	93.1	70 - 130
D 51 13C6_PFDA	884006	902324			102.1	50 - 150
6 N-MeFOSAA			1000.00	1042.82	104.3	70 - 130

Report Date: 18-Jul-2021 15:54:48 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521034.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1047631	1044767			99.7	50 - 150
9 PFDS			964.00	881.13	91.4	70 - 130
25 PFUdA			1000.00	953.00	95.3	70 - 130
5 N-EtFOSAA			1000.00	941.56	94.2	70 - 130
D 60 d5-EtFOSAA	933947	1005248			107.6	50 - 150
D 52 13C7_PFUdA	794481	847798			106.7	50 - 150
D 61 d7-MeFOSE	139728	134906			96.5	50 - 150
32 MeFOSE			1000.00	1054.51	105.5	70 - 130
26 MeFOSA			1000.00	1005.95	100.6	70 - 130
D 57 d3-MeFOSA	59067	56313			95.3	50 - 150
31 11Cl-PF3OUDS			942.00	773.95	82.2	70 - 130
D 62 d9-EtFOSE	128491	136087			105.9	50 - 150
33 EtFOSE			1000.00	991.74	99.2	70 - 130
D 59 d5-EtFOSA	56042	56599			101	50 - 150
27 EtFOSA			1000.00	1053.87	105.4	70 - 130
11 PFDoA			1000.00	899.90	90	70 - 130
D 38 13C2_PFDoA	774066	827772			106.9	50 - 150
4 10:2 FTS			964.00	975.59	101.2	70 - 130
34 PFDOS			968.00	846.31	87.4	70 - 130
24 PFTrDA			1000.00	839.06	83.9	70 - 130
23 PFTeDA			1000.00	904.04	90.4	70 - 130
D 42 13C2_PFTeDA	796198	906464			113.8	50 - 150
D 40 13C2_PFHxDA	451058	427374			94.7	50 - 150
35 PFHxDA			1000.00	1029.39	102.9	70 - 130
36 PFODA			1000.00	920.55	92.1	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521034.d
Injection Date: 15-Jul-2021 16:55:05 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 23
Sample Info: CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.707	1.702	1	1140870	22	>100:1			1000.00	1232.61	102.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.707	1.708	0/-1	1075242	23	>100:1			1000.00	930.12		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.068	0	1188025	17	>100:1			1000.00	1253.50	103.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.067	2.068	0/0	1077331	16	>100:1			1000.00	908.90		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	0	359916	18	>100:1			1000.00	1186.27	111.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.120	0/0	367419	17	>100:1	Target = 3.79		884.00	738.51		
298.9 > 99	44	2.120	2.120		98462	16	>100:1	3.73 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	1/1	305756	21	>100:1	Target = 3.30		938.00	834.94		
349 > 99	44	2.476	2.476		94345	19	>100:1	3.24 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	337536	21	>100:1			5000.00	7370.72	107.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	0/0	102425	19	>100:1	Target = 1.48		934.00	863.35		
327 > 81	63	2.398	2.398		61190	19	>100:1	1.67 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	1	1041013	19	>100:1			1000.00	1245.61	101.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	1/0	897681	20	>100:1	Target = 16.51		1000.00	890.35		
313 > 119	49	2.441	2.441		53069	28	>100:1	16.91 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	672778	21	>100:1			5000.00	4067.99	102.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	1/0	238829	20	>100:1	Target = 0.69		2000.00	2543.25		
285 > 185	66	2.563	2.563		290202	20	>100:1	0.82 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.829	2.828	1	1030895	21	>100:1			1000.00	1142.00	98.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.829	2.828	1/0	860716	20	>100:1	Target = 3.47		1000.00	910.97		
363 > 169	47	2.829	2.828		269696	20	>100:1	3.19 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.847	2.846	1	306230	20	>100:1			1000.00	1127.96	106.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.847	2.846	1/0	279267	29	>100:1	Target = 3.30	0.16	910.00	820.29		
399 > 99	45	2.847	2.846		76769	26	>100:1	3.63 (1.65-4.95)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.863	1/0	1489605	20	>100:1	Target = 2.54		942.00	960.20		
377 > 85	45	2.873	2.863		562353	20	>100:1	2.64 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.230	3.223	1/0	258415	26	>100:1	Target = 3.54		952.00	859.90		
449 > 99	45	3.224	3.223		72950	23	>100:1	3.54 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.192	3.191	1	290442	25	>100:1			5000.00	6538.73	113.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.198	3.191	1/0	99301	22	>100:1	Target = 1.46		948.00	907.87		
427 > 81	64	3.192	3.191		70257	24	>100:1	1.41 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.224	3.217	1	989006	25	>100:1			1000.00	1102.51	104.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.224	3.217	1/0	958947	23	>100:1	Target = 2.72		1000.00	968.71		
413 > 169	53	3.224	3.217		338161	23	>100:1	2.83 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.597	3.588	1	262573	23	>100:1			1000.00	1153.03	110.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.597	3.595	1/0	259238	44	>100:1	Target = 3.88	0.23	928.00	882.14		M
499 > 99	54	3.597	3.595		60269	35	>100:1	4.30 (1.94-5.83)	0.13				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.799	3.797	1/0	712157	21	>100:1			932.00	944.92		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.934	3.924	1/0	206103	21	>100:1	Target = 3.09		960.00	928.28		
549 > 99	54	3.934	3.924		59336	19	>100:1	3.47 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.226	1/0	229303	19	>100:1	Target = 3.32		964.00	881.13		
599 > 99	54	4.237	4.226		65381	19	>100:1	3.50 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.384	4.382	1/0	521013	18	>100:1			942.00	773.95		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.728	4.725	1/0	194592	21	>100:1	Target = 3.35		968.00	846.31		
699 > 99	54	4.728	4.725		53944	21	>100:1	3.60 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.597	3.603	0	1004681	22	>100:1			1000.00	1129.62	103.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.597	3.595	1/1	796093	22	>100:1	Target = 4.81		1000.00	934.12		
463 > 169	56	3.597	3.595		79532	10	>100:1	10.00 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.888	3.886	1	424184	19	>100:1			1000.00	941.26	97.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.896	3.878	2/1	430741	19	>100:1	Target = 40.56		1000.00	996.57		
498>478	55	3.888	3.878		12428	27		34.65 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.934	3.931	1	208231	22	>100:1			5000.00	6388.13	105	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.934	3.924	1/0	61320	18	>100:1	Target = 1.50		958.00	911.15		
527 > 81	65	3.942	3.924		41437	19	>100:1	1.47 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.523	4.530	0/-1	80433	20	>100:1	Target = 2.24		964.00	975.59		
627 > 80	65	4.531	4.530		34402	18	>100:1	2.33 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.942	3.939	1	902324	20	>100:1			1000.00	1189.99	102.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.942	3.939	1/0	764609	20	>100:1	Target = 9.65		1000.00	931.11		
513 > 169	51	3.942	3.939		76888	19	>100:1	9.94 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.095	4.093	1	1044767	19	>100:1			5000.00	5225.20	99.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.103	4.093	1/0	167430	35	>100:1	Target = 1.47	0.05	1000.00	1042.82		M
570 > 483	58	4.103	4.093		114590	34	>100:1	1.46 (0.73-2.21)	0.23				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.256	4.254	1	1005248	18	>100:1			5000.00	5597.58	107.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.265	4.254	1/0	189078	33	>100:1	Target = 1.78	0.09	1000.00	941.56		M
584 > 526	60	4.256	4.254		99686	29	>100:1	1.89 (0.89-2.67)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.247	4.245	1	847798	16	>100:1			1000.00	1134.41	106.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.256	4.245	1/0	713157	18	>100:1	Target = 9.77		1000.00	953.00		
563 > 169	52	4.247	4.245		68743	16	>100:1	10.37 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.312	4.301	1	134906	17	>100:1			1000.00	776.00	96.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.321	4.310	1/0	128098	17	>100:1			1000.00	1054.51		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.330	4.319	1	56313	15	>100:1			1000.00	904.48	95.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.330	4.319	1/0	60008	17	>100:1	Target = 1.18		1000.00	1005.95		
512 > 219	57	4.330	4.319		63817	19	87:1	0.94 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.474	4.456	2	136087	20	>100:1			1000.00	858.97	105.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.482	4.472	1/-1	112912	21	>100:1			1000.00	991.74		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.490	4.481	1	56599	21	>100:1			1000.00	927.18	101	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.498	4.489	1/0	61922	18	>100:1	Target = 1.11		1000.00	1053.87		
526 > 219	59	4.498	4.489		59798	16	>100:1	1.03 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.523	4.513	1	827772	18	>100:1			1000.00	1069.19	106.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.515	4.513	1/0	716807	18	>100:1	Target = 7.48		1000.00	899.90		
613 > 169	38	4.523	4.513		91526	21	>100:1	7.83 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.752	4.750	1/0	294596	20	>100:1	Target = 3.23		1000.00	839.06		
663 > 169	38	4.752	4.750		92301	21	>100:1	3.19 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.967	4.972	0	906464	20	>100:1			1000.00	1096.57	113.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.967	4.972	0/0	658925	20	81:1	Target = 8.62		1000.00	904.04		
713 > 169	42	4.974	4.972		70365	19	>100:1	9.36 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.351	5.356	0	427374	18	>100:1			1000.00	837.51	94.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.360	5.356	1/1	676949	20	66:1	Target = 12.71		1000.00	1029.39		
813 > 269	40	5.351	5.356		51080	19	>100:1	13.25 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.726	5.722	1/1	475823	25	62:1	Target = 113.87		1000.00	920.55		
913 > 319	40	5.726	5.722		4460	21	>100:1	106.68 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.942	3.939	1	807322	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	1	936327	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.224	3.217	1	1045355	33	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.707	1.708	0	1040488	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.597	3.595	1	244273	22	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521050.d
Injection Date: 15-Jul-2021 19:44:31 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 38
Sample Info: CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1113527	1127087			101.2	50 - 150
8 PFBA			1000.00	918.74	91.9	70 - 130
D 50 13C5_PFPeA	1149706	1169128			101.7	50 - 150
21 PFPeA			1000.00	892.53	89.3	70 - 130
7 PFBS			884.00	798.11	90.3	70 - 130
D 44 13C3_PFBS	323186	338032			104.6	50 - 150
1 4:2 FTS			934.00	927.58	99.3	70 - 130
D 63 13C2_4:2 FTS_2	315070	309480			98.2	50 - 150
D 49 13C5_PFHxA	1021493	1007882			98.7	50 - 150
15 PFHxA			1000.00	892.98	89.3	70 - 130
22 PFPeS			938.00	917.56	97.8	70 - 130
28 GenX			2000.00	2376.89	118.8	70 - 130
D 66 13C3_GenX	656369	671488			102.3	50 - 150
D 47 13C4_PFHpA	1044534	1010671			96.8	50 - 150
13 PFHpA			1000.00	919.96	92	70 - 130
D 45 13C3_PFHxS	288464	284361			98.6	50 - 150
14 PFHxS			910.00	857.54	94.2	70 - 130
29 ADONA			942.00	921.49	97.8	70 - 130
D 64 13C2_6:2 FTS_2	256829	244097			95	50 - 150
2 6:2 FTS			948.00	1082.56	114.2	70 - 130
20 PFOA			1000.00	887.41	88.7	70 - 130
D 53 13C8_PFOA	944865	1029146			108.9	50 - 150
12 PFHpS			952.00	907.40	95.3	70 - 130
18 PFOS			928.00	880.15	94.8	70 - 130
D 54 13C8_PFOS	236731	255826			108.1	50 - 150
17 PFNA			1000.00	891.55	89.2	70 - 130
D 56 13C9_PFNA	974663	1017084			104.4	50 - 150
30 9Cl-PF3ONS			932.00	819.59	87.9	70 - 130
D 55 13C8_PFOSA	436170	459479			105.3	50 - 150
19 PFOSA			1000.00	955.60	95.6	70 - 130
16 PFNS			960.00	974.62	101.5	70 - 130
D 65 13C2_8:2 FTS_2	198400	197737			99.7	50 - 150
3 8:2 FTS			958.00	1051.32	109.7	70 - 130
10 PFDA			1000.00	874.21	87.4	70 - 130
D 51 13C6_PFDA	884006	883595			100	50 - 150
6 N-MeFOSAA			1000.00	1086.19	108.6	70 - 130

Report Date: 18-Jul-2021 15:55:05 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521050.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1047631	1002597			95.7	50 - 150
9 PFDS			964.00	804.60	83.5	70 - 130
25 PFUdA			1000.00	888.68	88.9	70 - 130
5 N-EtFOSAA			1000.00	987.67	98.8	70 - 130
D 60 d5-EtFOSAA	933947	951280			101.9	50 - 150
D 52 13C7_PFUdA	794481	828294			104.3	50 - 150
D 61 d7-MeFOSE	139728	133467			95.5	50 - 150
32 MeFOSE			1000.00	1005.08	100.5	70 - 130
26 MeFOSA			1000.00	1096.19	109.6	70 - 130
D 57 d3-MeFOSA	59067	55918			94.7	50 - 150
31 11Cl-PF3OUDS			942.00	798.07	84.7	70 - 130
D 62 d9-EtFOSE	128491	140736			109.5	50 - 150
33 EtFOSE			1000.00	791.84	79.2	70 - 130
D 59 d5-EtFOSA	56042	53320			95.1	50 - 150
27 EtFOSA			1000.00	1017.07	101.7	70 - 130
11 PFDoA			1000.00	858.10	85.8	70 - 130
D 38 13C2_PFDoA	774066	826755			106.8	50 - 150
4 10:2 FTS			964.00	839.32	87.1	70 - 130
34 PFDOS			968.00	880.63	91	70 - 130
24 PFTrDA			1000.00	800.36	80	70 - 130
23 PFTeDA			1000.00	935.62	93.6	70 - 130
D 42 13C2_PFTeDA	796198	806113			101.2	50 - 150
D 40 13C2_PFHxDA	451058	419685			93	50 - 150
35 PFHxDA			1000.00	1038.66	103.9	70 - 130
36 PFODA			1000.00	935.69	93.6	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521050.d
Injection Date: 15-Jul-2021 19:44:31 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 38
Sample Info: CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.702	1	1127087	22	>100:1			1000.00	1217.72	101.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.708	0/-1	1049252	22	>100:1			1000.00	918.74		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.068	0	1169128	18	>100:1			1000.00	1233.56	101.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.068	0/0	1041097	17	>100:1			1000.00	892.53		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.120	0	338032	17	>100:1			1000.00	1114.14	104.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.129	2.120	1/1	372931	17	>100:1	Target = 3.79		884.00	798.11		
298.9 > 99	44	2.129	2.120		99448	18	>100:1	3.75 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.484	2.476	1/1	315582	20	>100:1	Target = 3.30		938.00	917.56		
349 > 99	44	2.475	2.476		79861	19	>100:1	3.95 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.398	0	309480	22	>100:1			5000.00	6758.06	98.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.405	2.398	1/1	100898	20	>100:1	Target = 1.48		934.00	927.58		
327 > 81	63	2.397	2.398		66901	21	>100:1	1.50 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.440	2.441	0	1007882	20	>100:1			1000.00	1205.97	98.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.440	2.441	0/0	871679	21	>100:1	Target = 16.51		1000.00	892.98		
313 > 119	49	2.440	2.441		52027	21	>100:1	16.75 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.562	2.563	0	671488	21	>100:1			5000.00	4060.19	102.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.562	2.563	0/0	222778	20	>100:1	Target = 0.69		2000.00	2376.89		
285 > 185	66	2.562	2.563		279729	20	>100:1	0.79 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.828	0	1010671	19	>100:1			1000.00	1119.60	96.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.827	2.828	0/0	852166	21	>100:1	Target = 3.47		1000.00	919.96		
363 > 169	47	2.827	2.828		264527	21	>100:1	3.22 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.844	2.846	0	284361	22	>100:1			1000.00	1047.41	98.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.853	2.846	1/1	271099	28	>100:1	Target = 3.30	0.15	910.00	857.54		
399 > 99	45	2.844	2.846		82612	28	>100:1	3.28 (1.65-4.95)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.871	2.863	1/1	1327458	21	>100:1	Target = 2.54		942.00	921.49		
377 > 85	45	2.871	2.863		535924	21	>100:1	2.47 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.234	3.223	1/1	253217	25	>100:1	Target = 3.54		952.00	907.40		
449 > 99	45	3.234	3.223		73340	30	>100:1	3.45 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.202	3.191	1	244097	30	>100:1			5000.00	5495.36	95	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.202	3.191	1/0	98372	26	>100:1	Target = 1.46		948.00	1082.56		M
427 > 81	64	3.195	3.191		63521	36	>100:1	1.54 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.227	3.217	1	1029146	25	>100:1			1000.00	1147.25	108.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.227	3.217	1/0	914121	23	>100:1	Target = 2.72		1000.00	887.41		
413 > 169	53	3.227	3.217		343847	25	>100:1	2.65 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.600	3.588	1	255826	22	>100:1			1000.00	1123.40	108.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.600	3.595	1/0	252020	45	>100:1	Target = 3.88	0.25	928.00	880.15		M
499 > 99	54	3.608	3.595		62808	33	>100:1	4.01 (1.94-5.83)	0.07				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.804	3.797	1/0	601822	23	>100:1			932.00	819.59		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.947	3.924	2/1	210832	19	>100:1	Target = 3.09		960.00	974.62		
549 > 99	54	3.939	3.924		58084	20	>100:1	3.62 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.235	4.226	1/0	204005	17	>100:1	Target = 3.32		964.00	804.60		
599 > 99	54	4.245	4.226		64172	18	>100:1	3.17 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.399	4.382	2/1	523444	19	>100:1			942.00	798.07		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.733	4.725	1/0	197279	22	>100:1	Target = 3.35		968.00	880.63		
699 > 99	54	4.733	4.725		56540	20		3.48 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.608	3.603	1	1017084	21	>100:1			1000.00	1143.56	104.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.608	3.595	1/0	769189	21	>100:1	Target = 4.81		1000.00	891.55		
463 > 169	56	3.608	3.595		148588	20	>100:1	5.17 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.900	3.886	1	459479	19	>100:1			1000.00	1019.58	105.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.900	3.878	2/1	447402	19	>100:1	Target = 40.56		1000.00	955.60		
498>478	55	3.893	3.878		12119	24	78:1	36.91 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.947	3.931	1	197737	19	>100:1			5000.00	6066.19	99.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.947	3.924	2/1	67188	21	>100:1	Target = 1.50		958.00	1051.32		
527 > 81	65	3.947	3.924		43409	18	>100:1	1.54 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.530	4.530	1/0	65711	17	>100:1	Target = 2.24		964.00	839.32		
627 > 80	65	4.538	4.530		28459	23	>100:1	2.30 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.947	3.939	1	883595	19	>100:1			1000.00	1165.29	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.947	3.939	1/0	702977	20	>100:1	Target = 9.65		1000.00	874.21		
513 > 169	51	3.955	3.939		67807	19	>100:1	10.36 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.101	4.093	1	1002597	19	>100:1			5000.00	5014.30	95.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.118	4.093	2/1	167354	36	>100:1	Target = 1.47	0.06	1000.00	1086.19		M
570 > 483	58	4.110	4.093		107610	37	>100:1	1.55 (0.73-2.21)	0.16				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.254	4.254	0	951280	17	>100:1			5000.00	5297.07	101.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.263	4.254	1/1	187689	38	>100:1	Target = 1.78	0.07	1000.00	987.67		M
584 > 526	60	4.263	4.254		108182	33	>100:1	1.73 (0.89-2.67)	0.20				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.254	4.245	1	828294	18	>100:1			1000.00	1108.32	104.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.263	4.245	2/1	649729	18	>100:1	Target = 9.77		1000.00	888.68		
563 > 169	52	4.263	4.245		60886	18	>100:1	10.67 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.310	4.301	1	133467	16	>100:1			1000.00	767.72	95.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.310	2/1	120792	18	>100:1			1000.00	1005.08		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.319	2	55918	14	>100:1			1000.00	898.14	94.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.338	4.319	2/0	64932	19	75:1	Target = 1.18		1000.00	1096.19		
512 > 219	57	4.338	4.319		63902	19	>100:1	1.01 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.456	2	140736	29	>100:1			1000.00	888.31	109.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.489	4.472	2/0	93233	15	>100:1			1000.00	791.84		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.497	4.481	2	53320	18	>100:1			1000.00	873.46	95.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.505	4.489	2/0	56298	16	>100:1	Target = 1.11		1000.00	1017.07		
526 > 219	59	4.505	4.489		54732	16	>100:1	1.02 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.522	4.513	1	826755	18	>100:1			1000.00	1067.87	106.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.522	4.513	1/0	682673	18	>100:1	Target = 7.48		1000.00	858.10		
613 > 169	38	4.530	4.513		95141	18	>100:1	7.17 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.763	4.750	1/0	280664	22	>100:1	Target = 3.23		1000.00	800.36		
663 > 169	38	4.757	4.750		88920	24	>100:1	3.15 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.973	4.972	1	806113	19	>100:1			1000.00	975.17	101.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.981	4.972	1/0	606447	19	80:1	Target = 8.62		1000.00	935.62		
713 > 169	42	4.981	4.972		64604	22	>100:1	9.38 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.365	5.356	1	419685	19	>100:1			1000.00	822.44	93	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.365	5.356	1/0	670758	21	62:1	Target = 12.71		1000.00	1038.66		
813 > 269	40	5.365	5.356		47473	18	>100:1	14.12 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.730	5.722	1/0	474946	24	60:1	Target = 113.87		1000.00	935.69		
913 > 319	40	5.737	5.722		5052	37	>100:1	94.01 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.947	3.939	1	834241	21	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.440	2.441	0	859489	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.227	3.217	1	1006319	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.708	0	1067452	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.600	3.595	1	241562	22	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521062.d
Injection Date: 15-Jul-2021 21:51:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 49
Sample Info: CCV 1000D_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1113527	1101522			98.9	50 - 150
8 PFBA			1000.00	895.22	89.5	70 - 130
D 50 13C5_PFPeA	1149706	1117892			97.2	50 - 150
21 PFPeA			1000.00	877.88	87.8	70 - 130
7 PFBS			884.00	805.76	91.1	70 - 130
D 44 13C3_PFBS	323186	321439			99.5	50 - 150
1 4:2 FTS			934.00	919.75	98.5	70 - 130
D 63 13C2_4:2 FTS_2	315070	306462			97.3	50 - 150
D 49 13C5_PFHxA	1021493	998950			97.8	50 - 150
15 PFHxA			1000.00	868.21	86.8	70 - 130
22 PFPeS			938.00	881.11	93.9	70 - 130
28 GenX			2000.00	2399.72	120	70 - 130
D 66 13C3_GenX	656369	628525			95.8	50 - 150
D 47 13C4_PFHpA	1044534	998532			95.6	50 - 150
13 PFHpA			1000.00	959.30	95.9	70 - 130
D 45 13C3_PFHxS	288464	298723			103.6	50 - 150
14 PFHxS			910.00	870.77	95.7	70 - 130
29 ADONA			942.00	875.02	92.9	70 - 130
D 64 13C2_6:2 FTS_2	256829	263162			102.5	50 - 150
2 6:2 FTS			948.00	988.91	104.3	70 - 130
20 PFOA			1000.00	886.42	88.6	70 - 130
D 53 13C8_PFOA	944865	980293			103.7	50 - 150
12 PFHpS			952.00	830.77	87.3	70 - 130
18 PFOS			928.00	877.88	94.6	70 - 130
D 54 13C8_PFOS	236731	239139			101	50 - 150
17 PFNA			1000.00	941.88	94.2	70 - 130
D 56 13C9_PFNA	974663	993694			102	50 - 150
30 9Cl-PF3ONS			932.00	866.32	93	70 - 130
D 55 13C8_PFOSA	436170	435028			99.7	50 - 150
19 PFOSA			1000.00	1049.32	104.9	70 - 130
16 PFNS			960.00	905.32	94.3	70 - 130
D 65 13C2_8:2 FTS_2	198400	198407			100	50 - 150
3 8:2 FTS			958.00	1081.24	112.9	70 - 130
10 PFDA			1000.00	906.55	90.7	70 - 130
D 51 13C6_PFDA	884006	856779			96.9	50 - 150
6 N-MeFOSAA			1000.00	1127.91	112.8	70 - 130

Report Date: 18-Jul-2021 15:55:10 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521062.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1047631	879892			84	50 - 150
9 PFDS			964.00	815.48	84.6	70 - 130
25 PFUdA			1000.00	886.53	88.7	70 - 130
5 N-EtFOSAA			1000.00	928.02	92.8	70 - 130
D 60 d5-EtFOSAA	933947	950581			101.8	50 - 150
D 52 13C7_PFUdA	794481	814552			102.5	50 - 150
D 61 d7-MeFOSE	139728	130183			93.2	50 - 150
32 MeFOSE			1000.00	1094.34	109.4	70 - 130
26 MeFOSA			1000.00	1095.50	109.6	70 - 130
D 57 d3-MeFOSA	59067	53249			90.2	50 - 150
31 11Cl-PF3OUDS			942.00	821.23	87.2	70 - 130
D 62 d9-EtFOSE	128491	115756			90.1	50 - 150
33 EtFOSE			1000.00	1112.16	111.2	70 - 130
D 59 d5-EtFOSA	56042	47368			84.5	50 - 150
27 EtFOSA			1000.00	1245.92	124.6	70 - 130
11 PFDoA			1000.00	899.64	90	70 - 130
D 38 13C2_PFDoA	774066	773153			99.9	50 - 150
4 10:2 FTS			964.00	866.80	89.9	70 - 130
34 PFDOS			968.00	881.05	91	70 - 130
24 PFTrDA			1000.00	828.94	82.9	70 - 130
23 PFTeDA			1000.00	939.28	93.9	70 - 130
D 42 13C2_PFTeDA	796198	740613			93	50 - 150
D 40 13C2_PFHxDA	451058	410948			91.1	50 - 150
35 PFHxDA			1000.00	973.01	97.3	70 - 130
36 PFODA			1000.00	874.99	87.5	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\071521-DOD.b\071521062.d
Injection Date: 15-Jul-2021 21:51:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 49
Sample Info: CCV 1000D_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.702	1	1101522	21	>100:1			1000.00	1190.10	98.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.708	1/0	999194	22	>100:1			1000.00	895.22		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.065	2.068	0	1117892	18	>100:1			1000.00	1179.50	97.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.065	2.068	0/0	979136	18	>100:1			1000.00	877.88		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.128	2.120	1	321439	17	>100:1			1000.00	1059.45	99.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.128	2.120	1/0	358022	17	>100:1	Target = 3.79		884.00	805.76		
298.9 > 99	44	2.128	2.120		90018	17	>100:1	3.97 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.474	2.476	0/-1	288170	20	>100:1	Target = 3.30		938.00	881.11		
349 > 99	44	2.483	2.476		90364	20	>100:1	3.18 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.405	2.398	1	306462	21	>100:1			5000.00	6692.16	97.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.405	2.398	1/0	99071	20		Target = 1.48		934.00	919.75		
327 > 81	63	2.405	2.398		65837	20	>100:1	1.50 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.448	2.441	1	998950	21	>100:1			1000.00	1195.28	97.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.448	2.441	1/0	839994	21	>100:1	Target = 16.51		1000.00	868.21		
313 > 119	49	2.448	2.441		46218	20	>100:1	18.17 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.570	2.563	1	628525	21	>100:1			5000.00	3800.41	95.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.570	2.563	1/0	210528	23	>100:1	Target = 0.69		2000.00	2399.72		
285 > 185	66	2.570	2.563		258356	21	>100:1	0.81 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.828	1	998532	20	>100:1			1000.00	1106.15	95.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.828	1/0	877932	20	>100:1	Target = 3.47		1000.00	959.30		
363 > 169	47	2.836	2.828		234971	19	>100:1	3.73 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.854	2.846	1	298723	20	>100:1			1000.00	1100.31	103.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.854	2.846	1/0	289186	29	>100:1	Target = 3.30	0.15	910.00	870.77		
399 > 99	45	2.854	2.846		75317	26	>100:1	3.83 (1.65-4.95)	0.09				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.880	2.863	2/1	1324188	21	>100:1	Target = 2.54		942.00	875.02		
377 > 85	45	2.880	2.863		519160	20	>100:1	2.55 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.240	3.223	2/1	243540	23	>100:1	Target = 3.54		952.00	830.77		
449 > 99	45	3.240	3.223		60849	21	>100:1	4.00 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.215	3.191	2	263162	26	>100:1			5000.00	5924.57	102.5	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.202	3.191	1/-1	97434	30	>100:1	Target = 1.46		948.00	988.91		
427 > 81	64	3.196	3.191		65269	26	>100:1	1.49 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.234	3.217	2	980293	25	>100:1			1000.00	1092.79	103.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.228	3.217	1/-1	869757	24	>100:1	Target = 2.72		1000.00	886.42		
413 > 169	53	3.228	3.217		328998	32	>100:1	2.64 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.609	3.588	2	239139	21	>100:1			1000.00	1050.12	101	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.609	3.595	1/-1	234986	43	>100:1	Target = 3.88	0.26	928.00	877.88		M
499 > 99	54	3.617	3.595		61373	36	>100:1	3.82 (1.94-5.83)	0.07				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.818	3.797	2/0	594642	21	>100:1			932.00	866.32		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.947	3.924	2/0	183067	19	>100:1	Target = 3.09		960.00	905.32		
549 > 99	54	3.947	3.924		52067	16	>100:1	3.51 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.245	4.226	2/0	193277	19	>100:1	Target = 3.32		964.00	815.48		
599 > 99	54	4.245	4.226		60969	17	>100:1	3.17 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.400	4.382	2/0	503502	20	>100:1			942.00	821.23		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.745	4.725	2/0	184499	22	>100:1	Target = 3.35		968.00	881.05		
699 > 99	54	4.745	4.725		50746	21	>100:1	3.63 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.617	3.603	1	993694	21	>100:1			1000.00	1117.26	102	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.617	3.595	2/1	793925	21	>100:1	Target = 4.81		1000.00	941.88		
463 > 169	56	3.617	3.595		159103	21	>100:1	4.99 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.908	3.886	2	435028	20	>100:1			1000.00	965.32	99.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.908	3.878	2/0	465136	19	>100:1	Target = 40.56		1000.00	1049.32		
498>478	55	3.908	3.878		9003	25	48:1	51.66 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.947	3.931	1	198407	19	>100:1			5000.00	6086.75	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.955	3.924	2/1	69334	22	>100:1	Target = 1.50		958.00	1081.24		
527 > 81	65	3.955	3.924		43621	26	>100:1	1.58 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.539	4.530	1/0	68092	17		Target = 2.24		964.00	866.80		
627 > 80	65	4.539	4.530		29682	20	>100:1	2.29 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.964	3.939	2	856779	20	>100:1			1000.00	1129.93	96.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.964	3.939	2/0	706860	18	>100:1	Target = 9.65		1000.00	906.55		
513 > 169	51	3.964	3.939		72487	26	>100:1	9.75 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.118	4.093	2	879892	20	>100:1			5000.00	4400.61	84	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.118	4.093	2/0	152514	36	>100:1	Target = 1.47	0.08	1000.00	1127.91		M
570 > 483	58	4.118	4.093		104845	30	>100:1	1.45 (0.73-2.21)	0.14				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.264	4.254	1	950581	18	>100:1			5000.00	5293.18	101.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.273	4.254	2/1	176223	38	>100:1	Target = 1.78	0.07	1000.00	928.02		M
584 > 526	60	4.273	4.254		108822	32	>100:1	1.61 (0.89-2.67)	0.14				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.264	4.245	2	814552	18	>100:1			1000.00	1089.93	102.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.264	4.245	2/0	637400	17	>100:1	Target = 9.77		1000.00	886.53		
563 > 169	52	4.264	4.245		66931	18	>100:1	9.52 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.320	4.301	2	130183	17	>100:1			1000.00	748.83	93.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.329	4.310	2/0	128283	17	>100:1			1000.00	1094.34		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.347	4.319	2	53249	16	>100:1			1000.00	855.27	90.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.347	4.319	2/0	61794	16	>100:1	Target = 1.18		1000.00	1095.50		
512 > 219	57	4.347	4.319		57785	15	77:1	1.06 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.456	2	115756	16	>100:1			1000.00	730.64	90.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.498	4.472	2/0	107705	17	>100:1			1000.00	1112.16		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.498	4.481	2	47368	21	>100:1			1000.00	775.96	84.5	M
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.514	4.489	2/0	61267	19	>100:1	Target = 1.11		1000.00	1245.92		
526 > 219	59	4.514	4.489		50001	15	>100:1	1.22 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.530	4.513	2	773153	19	>100:1			1000.00	998.64	99.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.530	4.513	2/0	669315	19	>100:1	Target = 7.48		1000.00	899.64		
613 > 169	38	4.530	4.513		90351	21	>100:1	7.40 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.769	4.750	2/0	271840	23	>100:1	Target = 3.23		1000.00	828.94		
663 > 169	38	4.769	4.750		80385	23	>100:1	3.38 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.981	4.972	1	740613	20	>100:1			1000.00	895.94	93	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.988	4.972	1/0	559354	18	72:1	Target = 8.62		1000.00	939.28		
713 > 169	42	4.988	4.972		61754	23	>100:1	9.05 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.366	5.356	1	410948	18	>100:1			1000.00	805.32	91.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.374	5.356	2/1	615279	19	55:1	Target = 12.71		1000.00	973.01		
813 > 269	40	5.366	5.356		48850	20	>100:1	12.59 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.738	5.722	1/0	434887	25	51:1	Target = 113.87		1000.00	874.99		
913 > 319	40	5.730	5.722		4537	28	>100:1	95.85 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.964	3.939	2	787779	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.448	2.441	1	880074	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.234	3.217	2	948622	26	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.708	1	992834	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.609	3.595	1	260418	24	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\071721-DOD.b\071721005.d
Injection Date: 17-Jul-2021 15:01:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC 1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	526195	544293			103.4	50 - 150
8 PFBA			100.00	105.35	105.3	70 - 130
D 50 13C5_PFPeA	554204	569045			102.7	50 - 150
21 PFPeA			100.00	99.623	99.6	70 - 130
7 PFBS			88.400	88.303	99.9	70 - 130
D 44 13C3_PFBS	206203	189495			91.9	50 - 150
1 4:2 FTS			93.400	98.421	105.4	70 - 130
D 63 13C2_4:2 FTS_2	107786	101200			93.9	50 - 150
D 49 13C5_PFHxA	627539	622159			99.1	50 - 150
15 PFHxA			100.00	99.265	99.3	70 - 130
22 PFPeS			93.800	96.627	103	70 - 130
28 GenX			200.00	201.91	101	70 - 130
D 66 13C3_GenX	1114703	1173146			105.2	50 - 150
D 47 13C4_PFHpA	498643	514349			103.1	50 - 150
13 PFHpA			100.00	92.723	92.7	70 - 130
14 PFHxS			91.000	92.629	101.8	70 - 130
D 45 13C3_PFHxS	162520	152130			93.6	50 - 150
29 ADONA			94.200	87.831	93.2	70 - 130
D 64 13C2_6:2 FTS_2	99835	90512			90.7	50 - 150
2 6:2 FTS			94.800	135.65	143.1	70 - 130
D 53 13C8_PFOA	518596	525335			101.3	50 - 150
20 PFOA			100.00	108.05	108.1	70 - 130
12 PFHpS			95.200	100.04	105.1	70 - 130
18 PFOS			92.800	102.07	110	70 - 130
D 54 13C8_PFOS	159637	162455			101.8	50 - 150
17 PFNA			100.00	126.72	126.7	70 - 130
D 56 13C9_PFNA	653988	647618			99	50 - 150
30 9Cl-PF3ONS			93.200	94.122	101	70 - 130
D 55 13C8_PFOSA	326627	330649			101.2	50 - 150
19 PFOSA			100.00	110.64	110.6	70 - 130
16 PFNS			96.000	102.40	106.7	70 - 130
3 8:2 FTS			95.800	74.914	78.2	70 - 130
10 PFDA			100.00	94.332	94.3	70 - 130
D 65 13C2_8:2 FTS_2	95787	93819			97.9	50 - 150
D 51 13C6_PFDA	633125	661972			104.6	50 - 150
D 58 d3-MeFOSAA	791027	799150			101	50 - 150

Report Date: 20-Jul-2021 15:03:12 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\organics\LL\LCMSMS02.i\071721-DOD.b\071721005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	54.996	55	70 - 130
9 PFDS			96.400	85.344	88.5	70 - 130
25 PFUdA			100.00	98.500	98.5	70 - 130
D 60 d5-EtFOSAA	733932	778154			106	50 - 150
D 52 13C7_PFUdA	665255	652951			98.2	50 - 150
5 N-EtFOSAA			100.00	96.916	96.9	70 - 130
D 61 d7-MeFOSE	87073	93198			107	50 - 150
32 MeFOSE			100.00	126.74	126.7	70 - 130
D 57 d3-MeFOSA	53272	53551			100.5	50 - 150
26 MeFOSA			100.00	109.37	109.4	70 - 130
31 11Cl-PF3OUDS			94.200	93.109	98.8	70 - 130
D 62 d9-EtFOSE	111593	116738			104.6	50 - 150
D 59 d5-EtFOSA	50190	52566			104.7	50 - 150
33 EtFOSE			100.00	113.90	113.9	70 - 130
27 EtFOSA			100.00	116.12	116.1	70 - 130
D 38 13C2_PFDoA	629301	621129			98.7	50 - 150
4 10:2 FTS			96.400	82.904	86	70 - 130
11 PFDoA			100.00	103.41	103.4	70 - 130
34 PFDOS			96.800	90.608	93.6	70 - 130
24 PFTrDA			100.00	109.64	109.6	70 - 130
23 PFTeDA			100.00	102.17	102.2	70 - 130
D 42 13C2_PFTeDA	815001	816154			100.1	50 - 150
35 PFHxDA			100.00	110.23	110.2	70 - 130
D 40 13C2_PFHxDA	985027	928240			94.2	50 - 150
36 PFODA			100.00	103.84	103.8	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\071721-DOD.b\071721005.d
Injection Date: 17-Jul-2021 15:01:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC 1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.715	1	544293	23	>100:1			1000.00	1031.04	103.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.722	1.722	2/1	57257	21	36:1			100.00	105.35		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.093	2.093	2	569045	18	>100:1			1000.00	1022.90	102.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.093	2.093	2/0	58340	17	85:1			100.00	99.623		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.146	2.146	2	189495	16	>100:1			1000.00	965.84	91.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.146	2.146	2/0	22037	17	>100:1	Target = 3.32		88.400	88.303		
298.9 > 99	44	2.146	2.146		6269	24	43:1	3.51 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.495	2.495	2/0	16815	16	>100:1	Target = 2.99		93.800	96.627		
349 > 99	44	2.486	2.495		5346	16	39:1	3.14 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.414	2.414	2	101200	18	>100:1			5000.00	4591.18	93.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.414	2.414	2/0	4187	21	41:1	Target = 1.69		93.400	98.421		
327 > 81	63	2.423	2.414		660	7	8.6:1	6.34 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.459	2.459	2	622159	19	>100:1			1000.00	1032.92	99.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.459	2.459	2/0	62737	19	77:1	Target = 18.10		100.00	99.265		
313 > 119	49	2.450	2.459		3164	11	24:1	19.82 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.574	2.574	2	1173146	21	>100:1			5000.00	5221.06	105.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.574	2.574	2/0	32365	20	>100:1	Target = 0.77		200.00	201.91		
285 > 185	66	2.574	2.574		39515	21	>100:1	0.81 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.835	2.835	3	514349	20	>100:1			1000.00	1022.22	103.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.826	2.826	2/-1	52021	19	91:1	Target = 3.84		100.00	92.723		
363 > 169	47	2.826	2.826		14195	21	39:1	3.66 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.844	2.844	2	152130	21	>100:1			1000.00	957.61	93.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.853	2.853	3/1	15035	31	57:1	Target = 2.95	0.10	91.000	92.629		
399 > 99	45	2.844	2.853		4844	23	21:1	3.10 (1.47-4.43)	0.19				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.871	2.871	2/0	78837	21	>100:1	Target = 2.95		94.200	87.831		
377 > 85	45	2.871	2.871		30687	20	>100:1	2.56 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.225	3.225	3/1	15155	43	91:1	Target = 2.85		95.200	100.04		
449 > 99	45	3.225	3.225		4398	19	35:1	3.44 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.191	3.191	2	90512	24	>100:1			5000.00	4593.80	90.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.205	3.205	3/1	8080	31	45:1	Target = 1.85		94.800	135.65		
427 > 81	64	3.191	3.205		4462	15	30:1	1.81 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.225	3.225	3	525335	24	>100:1			1000.00	1008.63	101.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.218	3.218	3/0	53426	21	33:1	Target = 2.73		100.00	108.05		
413 > 169	53	3.225	3.218		18841	26	71:1	2.83 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.598	3.598	3	162455	22	>100:1			1000.00	1018.74	101.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.606	3.606	4/1	19404	42	69:1	Target = 3.55	0.25	92.800	102.07		
499 > 99	54	3.590	3.606		5557	36	30:1	3.49 (1.77-5.33)	0.43				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.803	3.803	3/0	54527	28	>100:1			93.200	94.122		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.942	3.942	3/0	13453	25	49:1	Target = 2.84		96.000	102.40		
549 > 99	54	3.934	3.942		5457	24	32:1	2.46 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.251	4.251	0/-3	11461	15		Target = 2.90		96.400	85.344		M
599 > 99	54	4.211	4.251		3162	12	17:1	3.62 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.401	4.401	3/0	47156	17	>100:1			94.200	93.109		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.738	4.738	3/0	12949	23	>100:1	Target = 2.98		96.800	90.608		
699 > 99	54	4.738	4.738		4438	17	25:1	2.91 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.606	3.606	3	647618	24	>100:1			1000.00	984.68	99	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.606	3.606	3/0	82668	28	>100:1	Target = 6.23		100.00	126.72		
463 > 169	56	3.606	3.606		10729	24	59:1	7.70 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.884	3.884	1	330649	20	>100:1			1000.00	1022.61	101.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.884	3.884	1/0	36853	18	82:1	Target = 30.35		100.00	110.64		
498>478	55	3.901	3.884		200	11		184.26 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.942	3.942	3	93819	27	>100:1			5000.00	4751.47	97.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.925	3.925	2/-1	2849	12	14:1	Target = 1.76		95.800	74.914		
527 > 81	65	3.942	3.925		2838	25	9.4:1	1.00 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.522	4.522	2/-1	4282	18		Target = 3.19		96.400	82.904		
627 > 80	65	4.531	4.522		1127	18	11:1	3.79 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.942	3.942	3	661972	21	>100:1			1000.00	1074.08	104.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.951	3.951	3/0	67760	20	91:1	Target = 13.71		100.00	94.332		
513 > 169	51	3.942	3.951		5400	20	18:1	12.54 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.102	4.102	3	799150	21	>100:1			5000.00	4830.29	101	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.111	4.111	3/0	9071	19	18:1	Target = 1.62		100.00	54.996		
570 > 483	58	4.111	4.111		11215	42		0.80 (0.81-2.43)	0.36				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.262	4.262	4	778154	19	>100:1			5000.00	5379.54	106	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.262	4.262	0/-4	14133	29	62:1	Target = 1.65		100.00	96.916		M
584 > 526	60	4.262	4.262		10475	26	56:1	1.34 (0.82-2.48)	0.10				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.251	4.251	3	652951	19	>100:1			1000.00	1010.57	98.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.251	4.251	3/0	56725	17	>100:1	Target = 13.18		100.00	98.500		
563 > 169	52	4.272	4.251		3733	18	27:1	15.19 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.312	4.312	1	93198	19	>100:1			1000.00	977.96	107	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.322	4.322	1/0	12739	16	73:1			100.00	126.74		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.332	4.332	1	53551	16	90:1			1000.00	945.86	100.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.332	4.332	1/0	6247	25		Target = 1.03		100.00	109.37		
512 > 219	57	4.332	4.332		3939	21	26:1	1.58 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.477	4.477	1	116738	18	>100:1			1000.00	1100.26	104.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.486	4.486	1/0	13857	15	81:1			100.00	113.90		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.495	4.495	1	52566	19	>100:1			1000.00	1024.53	104.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.504	4.504	1/0	6654	18	35:1	Target = 0.93		100.00	116.12		
526 > 219	59	4.495	4.504		5547	17	21:1	1.19 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.531	4.531	3	621129	18	>100:1			1000.00	967.80	98.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.531	4.531	3/0	65489	19	33:1	Target = 10.57		100.00	103.41		
613 > 169	38	4.531	4.531		6716	27	48:1	9.75 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.772	4.772	4/1	62699	28	>100:1	Target = 7.53		100.00	109.64		
663 > 169	38	4.765	4.772		8058	22	>100:1	7.78 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.990	4.990	4	816154	24	>100:1			1000.00	978.24	100.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.990	4.990	3/-1	66997	20	53:1	Target = 10.46		100.00	102.17		
713 > 169	42	5.002	4.990		5845	25	>100:1	11.46 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.385	5.385	5	928240	21	>100:1			1000.00	949.40	94.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.394	5.394	5/0	62932	20	13:1	Target = 10.26		100.00	110.23		
813 > 269	40	5.385	5.394		5312	20	>100:1	11.84 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.772	5.772	7/2	87342	28	8.6:1	Target = 12.66		100.00	103.84		
913 > 319	40	5.772	5.772		6550	32	>100:1	13.33 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.942	3.942	3	661792	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.459	2	588346	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.225	3.225	3	533545	25	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.715	1.715	1	495097	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.598	3.598	3	156311	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\071721-DOD.b\071721006.d
Injection Date: 17-Jul-2021 15:12:14 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC 1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	544293	536861			98.6	50 - 150
8 PFBA			200.00	205.17	102.6	70 - 130
D 50 13C5_PFPeA	569045	572988			100.7	50 - 150
21 PFPeA			200.00	199.85	99.9	70 - 130
7 PFBS			176.80	182.41	103.2	70 - 130
D 44 13C3_PFBS	189495	185604			97.9	50 - 150
1 4:2 FTS			186.80	159.05	85.1	70 - 130
D 63 13C2_4:2 FTS_2	101200	100776			99.6	50 - 150
D 49 13C5_PFHxA	622159	602268			96.8	50 - 150
15 PFHxA			200.00	194.06	97	70 - 130
22 PFPeS			187.60	161.31	86	70 - 130
28 GenX			400.00	409.32	102.3	70 - 130
D 66 13C3_GenX	1173146	1170592			99.8	50 - 150
D 47 13C4_PFHpA	514349	524874			102	50 - 150
13 PFHpA			200.00	200.54	100.3	70 - 130
14 PFHxS			182.00	192.68	105.9	70 - 130
D 45 13C3_PFHxS	152130	157918			103.8	50 - 150
29 ADONA			188.40	186.12	98.8	70 - 130
D 64 13C2_6:2 FTS_2	90512	100923			111.5	50 - 150
2 6:2 FTS			189.60	194.17	102.4	70 - 130
D 53 13C8_PFOA	525335	546127			104	50 - 150
20 PFOA			200.00	196.58	98.3	70 - 130
12 PFHpS			190.40	204.36	107.3	70 - 130
18 PFOS			185.60	205.78	110.9	70 - 130
D 54 13C8_PFOS	162455	147555			90.8	50 - 150
17 PFNA			200.00	207.69	103.8	70 - 130
D 56 13C9_PFNA	647618	645355			99.7	50 - 150
30 9Cl-PF3ONS			186.40	190.28	102.1	70 - 130
D 55 13C8_PFOSA	330649	323717			97.9	50 - 150
19 PFOSA			200.00	201.86	100.9	70 - 130
16 PFNS			192.00	194.93	101.5	70 - 130
3 8:2 FTS			191.60	215.09	112.3	70 - 130
10 PFDA			200.00	215.41	107.7	70 - 130
D 65 13C2_8:2 FTS_2	93819	94862			101.1	50 - 150
D 51 13C6_PFDA	661972	599559			90.6	50 - 150
D 58 d3-MeFOSAA	799150	747011			93.5	50 - 150

Report Date: 20-Jul-2021 15:03:13 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\organics\LL\LCMSMS02.i\071721-DOD.b\071721006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	207.64	103.8	70 - 130
9 PFDS			192.80	196.92	102.1	70 - 130
25 PFUdA			200.00	207.41	103.7	70 - 130
D 60 d5-EtFOSAA	778154	743457			95.5	50 - 150
D 52 13C7_PFUdA	652951	637054			97.6	50 - 150
5 N-EtFOSAA			200.00	207.50	103.7	70 - 130
D 61 d7-MeFOSE	93198	92215			98.9	50 - 150
32 MeFOSE			200.00	215.11	107.6	70 - 130
D 57 d3-MeFOSA	53551	57199			106.8	50 - 150
26 MeFOSA			200.00	199.60	99.8	70 - 130
31 11Cl-PF3OUDS			188.40	204.27	108.4	70 - 130
D 62 d9-EtFOSE	116738	110714			94.8	50 - 150
D 59 d5-EtFOSA	52566	46156			87.8	50 - 150
33 EtFOSE			200.00	209.31	104.7	70 - 130
27 EtFOSA			200.00	246.45	123.2	70 - 130
D 38 13C2_PFDoA	621129	625554			100.7	50 - 150
4 10:2 FTS			192.80	179.40	93	70 - 130
11 PFDoA			200.00	206.94	103.5	70 - 130
34 PFDOS			193.60	197.27	101.9	70 - 130
24 PFTrDA			200.00	211.32	105.7	70 - 130
23 PFTeDA			200.00	202.73	101.4	70 - 130
D 42 13C2_PFTeDA	816154	790934			96.9	50 - 150
35 PFHxDA			200.00	204.32	102.2	70 - 130
D 40 13C2_PFHxDA	928240	904194			97.4	50 - 150
36 PFODA			200.00	192.74	96.4	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\071721-DOD.b\071721006.d
Injection Date: 17-Jul-2021 15:12:14 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC 1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.715	1	536861	23	>100:1			1000.00	1016.96	98.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.722	0/-1	109989	22	89:1			200.00	205.17		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.098	2.093	1	572988	16	>100:1			1000.00	1029.99	100.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.093	1/0	117842	21	>100:1			200.00	199.85		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.146	1	185604	17	>100:1			1000.00	946.01	97.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.146	1/0	44588	18	>100:1	Target = 3.32		176.80	182.41		
298.9 > 99	44	2.151	2.146		11492	13	>100:1	3.87 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.495	1/0	27494	17	>100:1	Target = 2.99		187.60	161.31		
349 > 99	44	2.496	2.495		11703	23	66:1	2.34 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.414	1	100776	16	>100:1			5000.00	4571.95	99.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.414	1/0	6738	15	>100:1	Target = 1.69		186.80	159.05		
327 > 81	63	2.407	2.414		6521	19	35:1	1.03 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.459	1	602268	19	>100:1			1000.00	999.89	96.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.459	1/0	118728	19	>100:1	Target = 18.10		200.00	194.06		
313 > 119	49	2.460	2.459		6759	19	22:1	17.56 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.567	2.574	0	1170592	20	>100:1			5000.00	5209.69	99.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.574	1/1	65468	20	>100:1	Target = 0.77		400.00	409.32		
285 > 185	66	2.575	2.574		83294	20	>100:1	0.78 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.835	0	524874	20	>100:1			1000.00	1043.14	102	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.826	1/1	114813	19	>100:1	Target = 3.84		200.00	200.54		
363 > 169	47	2.836	2.826		27700	19	>100:1	4.14 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.844	1	157918	21				1000.00	994.04	103.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.853	0/-1	32464	26		Target = 2.95	0.16	182.00	192.68		
399 > 99	45	2.836	2.853		11020	33	64:1	2.94 (1.47-4.43)	0.15				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.871	1/0	173419	22	>100:1	Target = 2.95		188.40	186.12		
377 > 85	45	2.873	2.871		54671	19	>100:1	3.17 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.228	3.225	1/0	32137	24	>100:1	Target = 2.85		190.40	204.36		
449 > 99	45	3.221	3.225		11375	39	71:1	2.82 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.194	3.191	1	100923	30	>100:1			5000.00	5122.19	111.5	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.194	3.205	0/-1	11750	29	>100:1	Target = 1.85		189.60	194.17		
427 > 81	64	3.194	3.205		6591	23	81:1	1.78 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.221	3.225	0	546127	25	>100:1			1000.00	1048.55	104	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.228	3.218	1/1	101047	22	62:1	Target = 2.73		200.00	196.58		
413 > 169	53	3.221	3.218		36817	31	>100:1	2.74 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.593	3.598	0	147555	23	>100:1			1000.00	925.30	90.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.593	3.606	0/0	35531	43	>100:1	Target = 3.55	0.27	185.60	205.78		
499 > 99	54	3.601	3.606		9896	32	>100:1	3.59 (1.77-5.33)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.807	3.803	1/1	100124	23	>100:1			186.40	190.28		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.937	3.942	0/0	23260	28		Target = 2.84		192.00	194.93		
549 > 99	54	3.937	3.942		9647	23		2.41 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.251	0/0	24019	17	>100:1	Target = 2.90		192.80	196.92		
599 > 99	54	4.247	4.251		8129	23		2.95 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.398	4.401	0/0	93967	20	>100:1			188.40	204.27		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.749	4.738	1/1	25607	29	>100:1	Target = 2.98		193.60	197.27		
699 > 99	54	4.749	4.738		7918	21		3.23 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.601	3.606	0	645355	22	>100:1			1000.00	981.24	99.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.601	3.606	0/0	135016	22	>100:1	Target = 6.23		200.00	207.69		
463 > 169	56	3.609	3.606		21190	21	>100:1	6.37 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.888	3.884	1	323717	22	>100:1			1000.00	1001.17	97.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.888	3.884	1/0	65830	21	>100:1	Target = 30.35		200.00	201.86		
498>478	55	3.871	3.884		2225	15	13:1	29.58 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.946	3.942	1	94862	22	>100:1			5000.00	4804.30	101.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.925	1/0	8271	21	31:1	Target = 1.76		191.60	215.09		
527 > 81	65	3.929	3.925		4120	27	34:1	2.00 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.536	4.522	1/0	8394	25		Target = 3.19		192.80	179.40		
627 > 80	65	4.545	4.522		3958	22	32:1	2.12 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.946	3.942	1	599559	20	>100:1			1000.00	972.82	90.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.955	3.951	1/0	140141	19	>100:1	Target = 13.71		200.00	215.41		
513 > 169	51	3.955	3.951		8938	16	40:1	15.67 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.102	1	747011	20	>100:1			5000.00	4515.15	93.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.111	0/-1	25689	30	50:1	Target = 1.62	0.11	200.00	207.64		
570 > 483	58	4.116	4.111		17599	28	68:1	1.45 (0.81-2.43)	0.08				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.258	4.262	0	743457	20	>100:1			5000.00	5139.67	95.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.268	4.262	1/1	28910	33	>100:1	Target = 1.65		200.00	207.50		M
584 > 526	60	4.258	4.262		16327	31	44:1	1.77 (0.82-2.48)	0.15				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.258	4.251	1	637054	19				1000.00	985.96	97.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.258	4.251	1/0	116536	23	>100:1	Target = 13.18		200.00	207.41		
563 > 169	52	4.268	4.251		7419	20	26:1	15.70 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.312	1	92215	19	>100:1			1000.00	967.64	98.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.322	1/0	21393	23	58:1			200.00	215.11		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.328	4.332	0	57199	18	>100:1			1000.00	1010.29	106.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.338	4.332	1/1	12177	17	41:1	Target = 1.03		200.00	199.60		
512 > 219	57	4.328	4.332		10169	18	84:1	1.19 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.473	4.477	0	110714	20	>100:1			1000.00	1043.48	94.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.482	4.486	0/0	24150	18	>100:1			200.00	209.31		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.500	4.495	1	46156	16	>100:1			1000.00	899.60	87.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.509	4.504	1/0	12400	16	57:1	Target = 0.93		200.00	246.45		
526 > 219	59	4.509	4.504		10118	17	54:1	1.22 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.536	4.531	1	625554	19	>100:1			1000.00	974.69	100.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.536	4.531	1/0	131991	19	45:1	Target = 10.57		200.00	206.94		
613 > 169	38	4.536	4.531		13168	25	61:1	10.02 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.776	4.772	1/0	121710	36	>100:1	Target = 7.53		200.00	211.32		
663 > 169	38	4.776	4.772		16081	29	>100:1	7.56 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.992	4.990	1	790934	23	>100:1			1000.00	948.01	96.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.990	1/0	128831	21	16:1	Target = 10.46		200.00	202.73		
713 > 169	42	4.992	4.990		11159	24	>100:1	11.54 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.385	1	904194	21	>100:1			1000.00	924.80	97.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.390	5.394	0/-1	113630	20	23:1	Target = 10.26		200.00	204.32		
813 > 269	40	5.390	5.394		10046	19	>100:1	11.31 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.775	5.772	1/0	157927	27	14:1	Target = 12.66		200.00	192.74		
913 > 319	40	5.768	5.772		11699	32	>100:1	13.49 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.946	3.942	1	671914	21	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.459	0	609407	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.225	0	527209	25	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.718	1.715	1	496182	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.593	3.598	0	149793	22	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\071721-DOD.b\071721020.d
Injection Date: 17-Jul-2021 17:40:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 13
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	544293	542669			99.7	50 - 150
8 PFBA			1000.00	910.42	91	70 - 130
D 50 13C5_PFPeA	569045	581825			102.2	50 - 150
21 PFPeA			1000.00	883.49	88.3	70 - 130
7 PFBS			884.00	834.78	94.4	70 - 130
D 44 13C3_PFBS	189495	186961			98.7	50 - 150
1 4:2 FTS			934.00	930.22	99.6	70 - 130
D 63 13C2_4:2 FTS_2	101200	96906			95.8	50 - 150
D 49 13C5_PFHxA	622159	623172			100.2	50 - 150
15 PFHxA			1000.00	898.01	89.8	70 - 130
22 PFPeS			938.00	866.64	92.4	70 - 130
28 GenX			2000.00	1987.48	99.4	70 - 130
D 66 13C3_GenX	1173146	1049388			89.5	50 - 150
D 47 13C4_PFHpA	514349	511098			99.4	50 - 150
13 PFHpA			1000.00	877.08	87.7	70 - 130
14 PFHxS			910.00	862.26	94.8	70 - 130
D 45 13C3_PFHxS	152130	154565			101.6	50 - 150
29 ADONA			942.00	866.23	92	70 - 130
D 64 13C2_6:2 FTS_2	90512	88656			97.9	50 - 150
2 6:2 FTS			948.00	962.20	101.5	70 - 130
D 53 13C8_PFOA	525335	523791			99.7	50 - 150
20 PFOA			1000.00	928.66	92.9	70 - 130
12 PFHpS			952.00	912.58	95.9	70 - 130
18 PFOS			928.00	795.37	85.7	70 - 130
D 54 13C8_PFOS	162455	161831			99.6	50 - 150
17 PFNA			1000.00	937.94	93.8	70 - 130
D 56 13C9_PFNA	647618	638169			98.5	50 - 150
30 9Cl-PF3ONS			932.00	792.34	85	70 - 130
D 55 13C8_PFOSA	330649	304697			92.2	50 - 150
19 PFOSA			1000.00	992.31	99.2	70 - 130
16 PFNS			960.00	812.56	84.6	70 - 130
3 8:2 FTS			958.00	1009.15	105.3	70 - 130
10 PFDA			1000.00	906.52	90.7	70 - 130
D 65 13C2_8:2 FTS_2	93819	82011			87.4	50 - 150
D 51 13C6_PFDA	661972	620536			93.7	50 - 150
D 58 d3-MeFOSAA	799150	745834			93.3	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	978.91	97.9	70 - 130
9 PFDS			964.00	834.24	86.5	70 - 130
25 PFUdA			1000.00	921.24	92.1	70 - 130
D 60 d5-EtFOSAA	778154	650270			83.6	50 - 150
D 52 13C7_PFUdA	652951	654226			100.2	50 - 150
5 N-EtFOSAA			1000.00	1093.22	109.3	70 - 130
D 61 d7-MeFOSE	93198	96639			103.7	50 - 150
32 MeFOSE			1000.00	962.58	96.3	70 - 130
D 57 d3-MeFOSA	53551	49412			92.3	50 - 150
26 MeFOSA			1000.00	1041.34	104.1	70 - 130
31 11Cl-PF3OUDS			942.00	795.15	84.4	70 - 130
D 62 d9-EtFOSE	116738	99857			85.5	50 - 150
D 59 d5-EtFOSA	52566	49157			93.5	50 - 150
33 EtFOSE			1000.00	1032.59	103.3	70 - 130
27 EtFOSA			1000.00	920.96	92.1	70 - 130
D 38 13C2_PFDoA	621129	638804			102.8	50 - 150
4 10:2 FTS			964.00	1039.06	107.8	70 - 130
11 PFDoA			1000.00	893.54	89.4	70 - 130
34 PFDOS			968.00	807.60	83.4	70 - 130
24 PFTrDA			1000.00	955.26	95.5	70 - 130
23 PFTeDA			1000.00	933.52	93.4	70 - 130
D 42 13C2_PFTeDA	816154	794544			97.4	50 - 150
35 PFHxDA			1000.00	1031.18	103.1	70 - 130
D 40 13C2_PFHxDA	928240	809220			87.2	50 - 150
36 PFODA			1000.00	997.00	99.7	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\071721-DOD.b\071721020.d
Injection Date: 17-Jul-2021 17:40:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 13
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.715	1	542669	23	>100:1			1000.00	1027.96	99.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.722	1/0	493339	23	>100:1			1000.00	910.42		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.099	2.093	2	581825	19	>100:1			1000.00	1045.87	102.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.099	2.093	2/0	528997	18	>100:1			1000.00	883.49		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.146	2	186961	17	>100:1			1000.00	952.93	98.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.146	2/0	205543	17	>100:1	Target = 3.32		884.00	834.78		
298.9 > 99	44	2.151	2.146		57311	15	>100:1	3.58 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.487	2.495	2/0	148796	19	>100:1	Target = 2.99		938.00	866.64		
349 > 99	44	2.487	2.495		50252	20	>100:1	2.96 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.414	2	96906	19	>100:1			5000.00	4396.38	95.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.414	2/0	37894	19	>100:1	Target = 1.69		934.00	930.22		
327 > 81	63	2.416	2.414		19632	20	>100:1	1.93 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.459	2	623172	20	>100:1			1000.00	1034.60	100.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.459	2/0	568481	20	>100:1	Target = 18.10		1000.00	898.01		
313 > 119	49	2.451	2.459		30129	20	>100:1	18.86 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.567	2.574	2	1049388	21	>100:1			5000.00	4670.28	89.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.574	2/0	284973	21	>100:1	Target = 0.77		2000.00	1987.48		
285 > 185	66	2.567	2.574		361308	21	>100:1	0.78 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.835	2	511098	21	>100:1			1000.00	1015.76	99.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.827	2.826	2/0	488965	21	>100:1	Target = 3.84		1000.00	877.08		
363 > 169	47	2.836	2.826		127310	20	>100:1	3.84 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.844	2	154565	21	>100:1			1000.00	972.94	101.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.853	2/0	142197	28	>100:1	Target = 2.95	0.15	910.00	862.26		
399 > 99	45	2.846	2.853		44679	25	>100:1	3.18 (1.47-4.43)	0.04				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.871	2/0	789968	22	>100:1	Target = 2.95		942.00	866.23		
377 > 85	45	2.864	2.871		264416	21	>100:1	2.98 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													a
449 > 80	45	3.221	3.225	0/-2	140464	26	>100:1	Target = 2.85		952.00	912.58		
449 > 99	45	3.228	3.225		46933	23	>100:1	2.99 (1.42-4.27)					M
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.195	3.191	3	88656	31	>100:1			5000.00	4499.60	97.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.195	3.205	3/0	41918	34	>100:1	Target = 1.85		948.00	962.20		
427 > 81	64	3.195	3.205		22388	28	>100:1	1.87 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.221	3.225	3	523791	25	>100:1			1000.00	1005.66	99.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.221	3.218	3/0	457820	25	>100:1	Target = 2.73		1000.00	928.66		
413 > 169	53	3.208	3.218		169823	26	>100:1	2.69 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.593	3.598	3	161831	23	>100:1			1000.00	1014.82	99.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.601	3.606	0/-3	150619	43	95:1	Target = 3.55		928.00	795.37		M
499 > 99	54	3.601	3.606		43719	35	>100:1	3.44 (1.77-5.33)	0.12				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.807	3.803	3/0	457256	24	>100:1			932.00	792.34		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.929	3.942	3/0	106339	22	>100:1	Target = 2.84		960.00	812.56		
549 > 99	54	3.937	3.942		41309	20	40:1	2.57 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.238	4.251	3/0	111601	19	>100:1	Target = 2.90		964.00	834.24		
599 > 99	54	4.238	4.251		44500	18		2.50 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.398	4.401	3/0	401167	22	>100:1			942.00	795.15		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.749	4.738	4/1	114973	24		Target = 2.98		968.00	807.60		
699 > 99	54	4.749	4.738		38365	22		2.99 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.601	3.606	3	638169	23	>100:1			1000.00	970.32	98.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.601	3.606	3/0	602948	23	>100:1	Target = 6.23		1000.00	937.94		
463 > 169	56	3.601	3.606		96909	23	>100:1	6.22 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.888	3.884	2	304697	21	>100:1			1000.00	942.34	92.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													a
498 > 78	55	3.880	3.884	0/-2	304592	21	>100:1	Target = 30.35		1000.00	992.31		
498>478	55	3.904	3.884		8008	17		38.03 (15.17-45.52)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.946	3.942	3	82011	21	>100:1			5000.00	4153.46	87.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.925	3/0	33548	20	>100:1	Target = 1.76		958.00	1009.15		
527 > 81	65	3.937	3.925		18273	39	>100:1	1.83 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.545	4.522	4/1	38561	21	>100:1	Target = 3.19		964.00	1039.06		
627 > 80	65	4.545	4.522		12094	20	63:1	3.18 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.946	3.942	3	620536	22	>100:1			1000.00	1006.85	93.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.946	3.951	3/0	610408	22	>100:1	Target = 13.71		1000.00	906.52		
513 > 169	51	3.946	3.951		43839	19	>100:1	13.92 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.102	3	745834	23	>100:1			5000.00	4508.04	93.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.111	0/-3	112470	33	>100:1	Target = 1.62		1000.00	978.91		M
570 > 483	58	4.107	4.111		76800	34	>100:1	1.46 (0.81-2.43)	0.24				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.258	4.262	3	650270	21	>100:1			5000.00	4495.45	83.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.268	4.262	1/-2	133222	33	>100:1	Target = 1.65		1000.00	1093.22		M
584 > 526	60	4.268	4.262		70575	29	89:1	1.88 (0.82-2.48)	0.18				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.258	4.251	3	654226	20	>100:1			1000.00	1012.54	100.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.258	4.251	3/0	531564	21	>100:1	Target = 13.18		1000.00	921.24		
563 > 169	52	4.268	4.251		41659	21	>100:1	12.75 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.308	4.312	1	96639	18	>100:1			1000.00	1014.06	103.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.318	4.322	1/0	100322	18	>100:1			1000.00	962.58		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.339	4.332	1	49412	22	57:1			1000.00	872.75	92.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.339	4.332	1/0	54881	17	>100:1	Target = 1.03		1000.00	1041.34		
512 > 219	57	4.339	4.332		52761	24	>100:1	1.04 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.473	4.477	1	99857	27	>100:1			1000.00	941.15	85.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.491	4.486	1/0	107457	18	>100:1			1000.00	1032.59		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.500	4.495	1	49157	18	>100:1			1000.00	958.09	93.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.500	4.504	1/0	49350	18	>100:1	Target = 0.93		1000.00	920.96		
526 > 219	59	4.509	4.504		49852	18	>100:1	0.98 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.536	4.531	4	638804	21	>100:1			1000.00	995.34	102.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.536	4.531	4/0	581987	21	>100:1	Target = 10.57		1000.00	893.54		
613 > 169	38	4.527	4.531		55003	17	>100:1	10.58 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.776	4.772	4/0	561826	27	>100:1	Target = 7.53		1000.00	955.26		
663 > 169	38	4.776	4.772		69062	26	>100:1	8.13 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.990	4	794544	25	>100:1			1000.00	952.34	97.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.990	4/0	595947	25	68:1	Target = 10.46		1000.00	933.52		
713 > 169	42	4.998	4.990		52363	25	>100:1	11.38 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.385	5	809220	22	>100:1			1000.00	827.66	87.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.399	5.394	5/0	513241	23	95:1	Target = 10.26		1000.00	1031.18		
813 > 269	40	5.399	5.394		49119	24	>100:1	10.44 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.775	5.772	7/2	731102	40	75:1	Target = 12.66		1000.00	997.00		
913 > 319	40	5.775	5.772		56113	41	>100:1	13.02 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.946	3.942	3	643464	22	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.459	2	589089	21	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.215	3.225	3	519575	26	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.718	1.715	1	473256	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.593	3.598	3	139877	23	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\071721-DOD.b\071721034.d
Injection Date: 17-Jul-2021 20:09:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 27
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	544293	552559			101.5	50 - 150
8 PFBA			1000.00	915.79	91.6	70 - 130
D 50 13C5_PFPeA	569045	584109			102.6	50 - 150
21 PFPeA			1000.00	894.65	89.5	70 - 130
7 PFBS			884.00	802.92	90.8	70 - 130
D 44 13C3_PFBS	189495	195784			103.3	50 - 150
1 4:2 FTS			934.00	885.29	94.8	70 - 130
D 63 13C2_4:2 FTS_2	101200	97557			96.4	50 - 150
D 49 13C5_PFHxA	622159	614957			98.8	50 - 150
15 PFHxA			1000.00	875.98	87.6	70 - 130
22 PFPeS			938.00	829.26	88.4	70 - 130
28 GenX			2000.00	1935.68	96.8	70 - 130
D 66 13C3_GenX	1173146	1030176			87.8	50 - 150
D 47 13C4_PFHpA	514349	521975			101.5	50 - 150
13 PFHpA			1000.00	883.33	88.3	70 - 130
14 PFHxS			910.00	848.48	93.2	70 - 130
D 45 13C3_PFHxS	152130	165609			108.9	50 - 150
29 ADONA			942.00	818.07	86.8	70 - 130
D 64 13C2_6:2 FTS_2	90512	89506			98.9	50 - 150
2 6:2 FTS			948.00	919.56	97	70 - 130
D 53 13C8_PFOA	525335	524251			99.8	50 - 150
20 PFOA			1000.00	1017.70	101.8	70 - 130
12 PFHpS			952.00	845.90	88.9	70 - 130
18 PFOS			928.00	922.28	99.4	70 - 130
D 54 13C8_PFOS	162455	148142			91.2	50 - 150
17 PFNA			1000.00	933.51	93.4	70 - 130
D 56 13C9_PFNA	647618	669032			103.3	50 - 150
30 9Cl-PF3ONS			932.00	881.36	94.6	70 - 130
D 55 13C8_PFOSA	330649	318988			96.5	50 - 150
19 PFOSA			1000.00	962.68	96.3	70 - 130
16 PFNS			960.00	1045.25	108.9	70 - 130
3 8:2 FTS			958.00	1089.29	113.7	70 - 130
10 PFDA			1000.00	912.55	91.3	70 - 130
D 65 13C2_8:2 FTS_2	93819	83587			89.1	50 - 150
D 51 13C6_PFDA	661972	618667			93.5	50 - 150
D 58 d3-MeFOSAA	799150	737550			92.3	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	974.93	97.5	70 - 130
9 PFDS			964.00	877.79	91.1	70 - 130
25 PFUdA			1000.00	963.20	96.3	70 - 130
D 60 d5-EtFOSAA	778154	668902			86	50 - 150
D 52 13C7_PFUdA	652951	639941			98	50 - 150
5 N-EtFOSAA			1000.00	1002.62	100.3	70 - 130
D 61 d7-MeFOSE	93198	82343			88.4	50 - 150
32 MeFOSE			1000.00	1132.59	113.3	70 - 130
D 57 d3-MeFOSA	53551	54247			101.3	50 - 150
26 MeFOSA			1000.00	909.88	91	70 - 130
31 11Cl-PF3OUDS			942.00	931.43	98.9	70 - 130
D 62 d9-EtFOSE	116738	102988			88.2	50 - 150
D 59 d5-EtFOSA	52566	48850			92.9	50 - 150
33 EtFOSE			1000.00	1074.71	107.5	70 - 130
27 EtFOSA			1000.00	1034.09	103.4	70 - 130
D 38 13C2_PFDoA	621129	634080			102.1	50 - 150
4 10:2 FTS			964.00	985.55	102.2	70 - 130
11 PFDoA			1000.00	876.75	87.7	70 - 130
34 PFDOS			968.00	938.85	97	70 - 130
24 PFTrDA			1000.00	903.99	90.4	70 - 130
23 PFTeDA			1000.00	922.70	92.3	70 - 130
D 42 13C2_PFTeDA	816154	826756			101.3	50 - 150
35 PFHxDA			1000.00	1043.41	104.3	70 - 130
D 40 13C2_PFHxDA	928240	814608			87.8	50 - 150
36 PFODA			1000.00	989.11	98.9	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\071721-DOD.b\071721034.d
Injection Date: 17-Jul-2021 20:09:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 27
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.715	1	552559	22	>100:1			1000.00	1046.69	101.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.722	1/0	505295	24	>100:1			1000.00	915.79		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.099	2.093	1	584109	17	>100:1			1000.00	1049.98	102.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.099	2.093	1/0	537780	18	>100:1			1000.00	894.65		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.162	2.146	1	195784	17	>100:1			1000.00	997.90	103.3	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.162	2.146	1/0	207028	17	>100:1	Target = 3.32		884.00	802.92		
298.9 > 99	44	2.162	2.146		59273	18	>100:1	3.49 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.495	1/0	149098	20	>100:1	Target = 2.99		938.00	829.26		
349 > 99	44	2.496	2.495		51190	20		2.91 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.414	0	97557	18	>100:1			5000.00	4425.91	96.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.425	2.414	1/1	36306	17	>100:1	Target = 1.69		934.00	885.29		
327 > 81	63	2.416	2.414		16483	15	>100:1	2.20 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.459	1	614957	20	>100:1			1000.00	1020.96	98.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.459	0/-1	547226	21	>100:1	Target = 18.10		1000.00	875.98		
313 > 119	49	2.460	2.459		29605	27	>100:1	18.48 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.574	1	1030176	21	>100:1			5000.00	4584.77	87.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.574	1/0	272464	21	>100:1	Target = 0.77		2000.00	1935.68		
285 > 185	66	2.575	2.574		366234	23	>100:1	0.74 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.846	2.835	2	521975	22	>100:1			1000.00	1037.38	101.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.846	2.826	2/0	502927	21	>100:1	Target = 3.84		1000.00	883.33		
363 > 169	47	2.846	2.826		138149	26	>100:1	3.64 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.855	2.844	1	165609	22	>100:1			1000.00	1042.45	108.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.855	2.853	1/0	149924	30	>100:1	Target = 2.95	0.16	910.00	848.48		
399 > 99	45	2.855	2.853		50627	28	>100:1	2.96 (1.47-4.43)	0.08				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.881	2.871	2/1	799361	24	>100:1	Target = 2.95		942.00	818.07		
377 > 85	45	2.881	2.871		270500	25	>100:1	2.95 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.242	3.225	2/1	139503	33	>100:1	Target = 2.85		952.00	845.90		
449 > 99	45	3.248	3.225		44140	24	>100:1	3.16 (1.42-4.27)					M
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.201	3.191	1	89506	27				5000.00	4542.74	98.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.201	3.205	1/0	40549	27	>100:1	Target = 1.85		948.00	919.56		
427 > 81	64	3.201	3.205		24912	27	>100:1	1.62 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.235	3.225	1	524251	27	>100:1			1000.00	1006.55	99.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.235	3.218	1/0	502159	34	>100:1	Target = 2.73		1000.00	1017.70		
413 > 169	53	3.235	3.218		168933	28	>100:1	2.97 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.609	3.598	1	148142	24				1000.00	928.98	91.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.609	3.606	1/0	159878	42	>100:1	Target = 3.55	0.23	928.00	922.28		
499 > 99	54	3.617	3.606		45912	41	>100:1	3.48 (1.77-5.33)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.823	3.803	1/0	465606	23	>100:1			932.00	881.36		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.955	3.942	2/1	125221	27	>100:1	Target = 2.84		960.00	1045.25		
549 > 99	54	3.955	3.942		41815	27	>100:1	2.99 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.248	4.251	1/0	107494	18	>100:1	Target = 2.90		964.00	877.79		
599 > 99	54	4.258	4.251		41954	26	>100:1	2.56 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.413	4.401	1/0	430171	22	>100:1			942.00	931.43		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.755	4.738	1/0	122352	31		Target = 2.98		968.00	938.85		
699 > 99	54	4.762	4.738		36509	25	>100:1	3.35 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.625	3.606	2	669032	26	>100:1			1000.00	1017.24	103.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.617	3.606	1/-1	629126	26	>100:1	Target = 6.23		1000.00	933.51		
463 > 169	56	3.617	3.606		108819	27	>100:1	5.78 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.896	3.884	1	318988	23	>100:1			1000.00	986.54	96.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.896	3.884	2/1	309357	23	>100:1	Target = 30.35		1000.00	962.68		
498>478	55	3.896	3.884		10338	39		29.92 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.946	3.942	0	83587	23				5000.00	4233.27	89.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.955	3.925	2/2	36908	22	>100:1	Target = 1.76		958.00	1089.29		
527 > 81	65	3.946	3.925		22362	17		1.65 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.545	4.522	0/0	37316	21	>100:1	Target = 3.19		964.00	985.55		
627 > 80	65	4.553	4.522		12333	42	94:1	3.02 (1.59-4.79)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.964	3.942	2	618667	21	>100:1			1000.00	1003.82	93.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.964	3.951	2/0	612614	23	>100:1	Target = 13.71		1000.00	912.55		
513 > 169	51	3.964	3.951		43779	19	>100:1	13.99 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.116	4.102	1	737550	23	>100:1			5000.00	4457.97	92.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.125	4.111	2/1	110778	30	>100:1	Target = 1.62	0.12	1000.00	974.93		
570 > 483	58	4.125	4.111		81467	26	22:1	1.35 (0.81-2.43)	0.20				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.278	4.262	2	668902	21	>100:1			5000.00	4624.25	86	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.278	4.262	1/-1	125682	33	>100:1	Target = 1.65	0.12	1000.00	1002.62		
584 > 526	60	4.278	4.262		77653	25	27:1	1.61 (0.82-2.48)	0.11				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.278	4.251	2	639941	19	>100:1			1000.00	990.43	98	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.268	4.251	1/-1	543641	19	>100:1	Target = 13.18		1000.00	963.20		
563 > 169	52	4.278	4.251		41303	15	>100:1	13.16 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.328	4.312	2	82343	18	>100:1			1000.00	864.05	88.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.339	4.322	2/0	100579	19	>100:1			1000.00	1132.59		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.348	4.332	1	54247	17	>100:1			1000.00	958.15	101.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.348	4.332	1/0	52645	18	>100:1	Target = 1.03		1000.00	909.88		
512 > 219	57	4.348	4.332		56232	20	>100:1	0.93 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.482	4.477	1	102988	23	>100:1			1000.00	970.66	88.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.500	4.486	1/0	115346	18	>100:1			1000.00	1074.71		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.509	4.495	1	48850	21	91:1			1000.00	952.11	92.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.509	4.504	1/0	55066	29	>100:1	Target = 0.93		1000.00	1034.09		
526 > 219	59	4.518	4.504		51209	19	>100:1	1.07 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.545	4.531	1	634080	22				1000.00	987.98	102.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.545	4.531	1/0	566831	21	>100:1	Target = 10.57		1000.00	876.75		
613 > 169	38	4.545	4.531		55299	22	>100:1	10.25 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.788	4.772	1/0	527743	25	>100:1	Target = 7.53		1000.00	903.99		
663 > 169	38	4.788	4.772		69420	27	>100:1	7.60 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.010	4.990	1	826756	26	>100:1			1000.00	990.95	101.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.010	4.990	1/0	612918	37	54:1	Target = 10.46		1000.00	922.70		
713 > 169	42	5.004	4.990		52201	27	>100:1	11.74 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.385	1	814608	24	>100:1			1000.00	833.18	87.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.407	5.394	1/0	522782	24	79:1	Target = 10.26		1000.00	1043.41		
813 > 269	40	5.407	5.394		49542	30	>100:1	10.55 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.782	5.772	1/0	730151	41	59:1	Target = 12.66		1000.00	989.11		
913 > 319	40	5.789	5.772		55684	36	>100:1	13.11 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.964	3.942	2	641254	23	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.459	1	564197	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.235	3.225	2	513272	27	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.718	1.715	1	470573	24	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.609	3.598	1	145605	32	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\071721-DOD.b\071721048.d
Injection Date: 17-Jul-2021 22:38:14 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 41
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	544293	575015			105.6	50 - 150
8 PFBA			1000.00	899.86	90	70 - 130
D 50 13C5_PFPeA	569045	608797			107	50 - 150
21 PFPeA			1000.00	900.06	90	70 - 130
7 PFBS			884.00	821.52	92.9	70 - 130
D 44 13C3_PFBS	189495	204470			107.9	50 - 150
1 4:2 FTS			934.00	938.74	100.5	70 - 130
D 63 13C2_4:2 FTS_2	101200	102873			101.7	50 - 150
D 49 13C5_PFHxA	622159	652244			104.8	50 - 150
15 PFHxA			1000.00	857.94	85.8	70 - 130
22 PFPeS			938.00	864.51	92.2	70 - 130
28 GenX			2000.00	2017.88	100.9	70 - 130
D 66 13C3_GenX	1173146	1074746			91.6	50 - 150
D 47 13C4_PFHpA	514349	575797			111.9	50 - 150
13 PFHpA			1000.00	846.19	84.6	70 - 130
14 PFHxS			910.00	835.39	91.8	70 - 130
D 45 13C3_PFHxS	152130	167882			110.4	50 - 150
29 ADONA			942.00	847.19	89.9	70 - 130
D 64 13C2_6:2 FTS_2	90512	95936			106	50 - 150
2 6:2 FTS			948.00	885.48	93.4	70 - 130
D 53 13C8_PFOA	525335	546183			104	50 - 150
20 PFOA			1000.00	956.83	95.7	70 - 130
12 PFHpS			952.00	807.77	84.8	70 - 130
18 PFOS			928.00	787.73	84.9	70 - 130
D 54 13C8_PFOS	162455	167417			103.1	50 - 150
17 PFNA			1000.00	915.13	91.5	70 - 130
D 56 13C9_PFNA	647618	705444			108.9	50 - 150
30 9Cl-PF3ONS			932.00	796.43	85.5	70 - 130
D 55 13C8_PFOSA	330649	317961			96.2	50 - 150
19 PFOSA			1000.00	990.24	99	70 - 130
16 PFNS			960.00	860.27	89.6	70 - 130
3 8:2 FTS			958.00	932.14	97.3	70 - 130
10 PFDA			1000.00	931.44	93.1	70 - 130
D 65 13C2_8:2 FTS_2	93819	91066			97.1	50 - 150
D 51 13C6_PFDA	661972	621649			93.9	50 - 150
D 58 d3-MeFOSAA	799150	793098			99.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	936.26	93.6	70 - 130
9 PFDS			964.00	834.76	86.6	70 - 130
25 PFUdA			1000.00	932.83	93.3	70 - 130
D 60 d5-EtFOSAA	778154	720584			92.6	50 - 150
D 52 13C7_PFUdA	652951	683511			104.7	50 - 150
5 N-EtFOSAA			1000.00	1070.64	107.1	70 - 130
D 61 d7-MeFOSE	93198	97140			104.2	50 - 150
32 MeFOSE			1000.00	949.47	94.9	70 - 130
D 57 d3-MeFOSA	53551	51523			96.2	50 - 150
26 MeFOSA			1000.00	1065.50	106.5	70 - 130
31 11Cl-PF3OUDS			942.00	840.47	89.2	70 - 130
D 62 d9-EtFOSE	116738	112931			96.7	50 - 150
D 59 d5-EtFOSA	52566	47858			91	50 - 150
33 EtFOSE			1000.00	1008.61	100.9	70 - 130
27 EtFOSA			1000.00	1051.88	105.2	70 - 130
D 38 13C2_PFDoA	621129	649800			104.6	50 - 150
4 10:2 FTS			964.00	982.14	101.9	70 - 130
11 PFDoA			1000.00	940.68	94.1	70 - 130
34 PFDOS			968.00	840.07	86.8	70 - 130
24 PFTrDA			1000.00	947.81	94.8	70 - 130
23 PFTeDA			1000.00	905.68	90.6	70 - 130
D 42 13C2_PFTeDA	816154	852415			104.4	50 - 150
35 PFHxDA			1000.00	1050.97	105.1	70 - 130
D 40 13C2_PFHxDA	928240	870890			93.8	50 - 150
36 PFODA			1000.00	968.46	96.8	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\071721-DOD.b\071721048.d
Injection Date: 17-Jul-2021 22:38:14 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 41
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.715	0	575015	23	>100:1			1000.00	1089.23	105.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.722	1.722	1/1	516684	23	>100:1			1000.00	899.86		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.104	2.093	1	608797	18	>100:1			1000.00	1094.36	107	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.104	2.093	1/0	563899	17	>100:1			1000.00	900.06		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.157	2.146	1	204470	17	>100:1			1000.00	1042.17	107.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.157	2.146	1/0	221221	19	>100:1	Target = 3.32		884.00	821.52		
298.9 > 99	44	2.157	2.146		62915	17	>100:1	3.51 (1.66-4.98)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.495	2.495	1/0	162331	21	>100:1	Target = 2.99		938.00	864.51		
349 > 99	44	2.504	2.495		54944	27	>100:1	2.95 (1.49-4.48)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.423	2.414	1	102873	18	>100:1			5000.00	4667.08	101.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.423	2.414	1/0	40596	19		Target = 1.69		934.00	938.74		
327 > 81	63	2.423	2.414		18746	38	>100:1	2.16 (0.84-2.54)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.468	2.459	1	652244	21	>100:1			1000.00	1082.87	104.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.468	2.459	1/0	568448	21	>100:1	Target = 18.10		1000.00	857.94		
313 > 119	49	2.468	2.459		29509	21	96:1	19.26 (9.05-27.15)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.582	2.574	1	1074746	22	>100:1			5000.00	4783.13	91.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.582	2.574	1/0	296324	23	>100:1	Target = 0.77		2000.00	2017.88		
285 > 185	66	2.582	2.574		378207	21	>100:1	0.78 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.844	2.835	2	575797	22	>100:1			1000.00	1144.34	111.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.844	2.826	2/0	531456	23	>100:1	Target = 3.84		1000.00	846.19		
363 > 169	47	2.844	2.826		149118	21	>100:1	3.56 (1.92-5.76)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.862	2.844	2	167882	23	>100:1			1000.00	1056.76	110.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.862	2.853	2/0	149636	31	>100:1	Target = 2.95	0.14	910.00	835.39		
399 > 99	45	2.862	2.853		50261	29	>100:1	2.97 (1.47-4.43)	0.06				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.887	2.871	2/0	839175	23	>100:1	Target = 2.95		942.00	847.19		
377 > 85	45	2.887	2.871		283508	23	>100:1	2.95 (1.47-4.42)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.245	3.225	1/-1	135043	27	>100:1	Target = 2.85		952.00	807.77		
449 > 99	45	3.245	3.225		43136	27	>100:1	3.13 (1.42-4.27)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.205	3.191	1	95936	34	>100:1			5000.00	4869.09	106	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													a
427 > 407	64	3.218	3.205	1/0	41945	29	>100:1	Target = 1.85		948.00	885.48		
427 > 81	64	3.198	3.205		21664	23	>100:1	1.93 (0.92-2.78)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.238	3.225	2	546183	35	>100:1			1000.00	1048.66	104	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.245	3.218	2/0	491875	36	>100:1	Target = 2.73		1000.00	956.83		
413 > 169	53	3.232	3.218		171738	28	>100:1	2.86 (1.36-4.10)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.606	3.598	1	167417	25	>100:1			1000.00	1049.85	103.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.628	3.606	2/1	154322	35	>100:1	Target = 3.55	0.24	928.00	787.73		
499 > 99	54	3.622	3.606		44429	32	43:1	3.47 (1.77-5.33)	0.07				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.834	3.803	2/1	475483	24	>100:1			932.00	796.43		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.959	3.942	2/1	116470	39	>100:1	Target = 2.84		960.00	860.27		
549 > 99	54	3.950	3.942		42291	28	>100:1	2.75 (1.42-4.27)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.260	4.251	2/1	115525	20	>100:1	Target = 2.90		964.00	834.76		
599 > 99	54	4.260	4.251		39579	19	>100:1	2.91 (1.45-4.35)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.422	4.401	2/1	438669	23	>100:1			942.00	840.47		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.772	4.738	2/1	123723	26	>100:1	Target = 2.98		968.00	840.07		
699 > 99	54	4.772	4.738		42351	44		2.92 (1.49-4.47)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.622	3.606	2	705444	36	>100:1			1000.00	1072.61	108.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.622	3.606	2/0	650299	32	>100:1	Target = 6.23		1000.00	915.13		
463 > 169	56	3.635	3.606		96655	26	>100:1	6.72 (3.11-9.35)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.908	3.884	2	317961	22	>100:1			1000.00	983.37	96.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.908	3.884	1/-1	317189	23	>100:1	Target = 30.35		1000.00	990.24		
498>478	55	3.908	3.884		9241	18	28:1	34.32 (15.17-45.52)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.968	3.942	2	91066	23				5000.00	4612.05	97.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.959	3.925	2/0	34409	22	>100:1	Target = 1.76		958.00	932.14		
527 > 81	65	3.959	3.925		18045	18		1.90 (0.88-2.64)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.556	4.522	3/1	40517	22	>100:1	Target = 3.19		964.00	982.14		
627 > 80	65	4.564	4.522		13978	18	52:1	2.89 (1.59-4.79)					M
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.968	3.942	2	621649	21	>100:1			1000.00	1008.66	93.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.978	3.951	2/0	628312	23	>100:1	Target = 13.71		1000.00	931.44		
513 > 169	51	3.978	3.951		44171	17	>100:1	14.22 (6.85-20.57)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.118	4.102	1	793098	23	>100:1			5000.00	4793.71	99.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.136	4.111	2/1	114492	30	87:1	Target = 1.62		1000.00	936.26		M
570 > 483	58	4.136	4.111		95688	33	>100:1	1.19 (0.81-2.43)					M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.280	4.262	2	720584	20	>100:1			5000.00	4981.54	92.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.290	4.262	2/0	144578	34	>100:1	Target = 1.65		1000.00	1070.64		M
584 > 526	60	4.290	4.262		86887	35	>100:1	1.66 (0.82-2.48)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.280	4.251	2	683511	21	>100:1			1000.00	1057.87	104.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.280	4.251	2/0	562345	20	>100:1	Target = 13.18		1000.00	932.83		
563 > 169	52	4.260	4.251		37915	17	>100:1	14.83 (6.59-19.78)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.331	4.312	2	97140	28	>100:1			1000.00	1019.32	104.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.340	4.322	2/0	99468	22	>100:1			1000.00	949.47		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.340	4.332	1	51523	25	>100:1			1000.00	910.04	96.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.359	4.332	2/1	58553	19	>100:1	Target = 1.03		1000.00	1065.50		
512 > 219	57	4.350	4.332		53426	21	>100:1	1.09 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.494	4.477	2	112931	24	>100:1			1000.00	1064.38	96.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.503	4.486	1/-1	118703	21	>100:1			1000.00	1008.61		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.521	4.495	2	47858	21	95:1			1000.00	932.77	91	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.521	4.504	2/0	54876	20	>100:1	Target = 0.93		1000.00	1051.88		
526 > 219	59	4.521	4.504		53797	19		1.02 (0.46-1.39)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.547	4.531	1	649800	23	>100:1			1000.00	1012.47	104.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.556	4.531	2/1	623237	23	>100:1	Target = 10.57		1000.00	940.68		
613 > 169	38	4.556	4.531		54695	24	>100:1	11.39 (5.28-15.86)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.797	4.772	2/1	567040	27	>100:1	Target = 7.53		1000.00	947.81		
663 > 169	38	4.797	4.772		71318	26	>100:1	7.95 (3.76-11.29)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.007	4.990	1	852415	28	>100:1			1000.00	1021.70	104.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.013	4.990	1/0	620288	28	63:1	Target = 10.46		1000.00	905.68		
713 > 169	42	5.013	4.990		56994	27	>100:1	10.88 (5.23-15.70)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.411	5.385	2	870890	24	>100:1			1000.00	890.74	93.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.411	5.394	1/-1	562955	26	82:1	Target = 10.26		1000.00	1050.97		
813 > 269	40	5.411	5.394		52952	32	>100:1	10.63 (5.13-15.40)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.793	5.772	2/0	764300	44	64:1	Target = 12.66		1000.00	968.46		
913 > 319	40	5.793	5.772		60207	44	>100:1	12.69 (6.33-19.00)					
*** 37 13C2_PFDA**													
515 > 470		3.978	3.942	2	696358	24	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.468	2.459	1	580998	21	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.245	3.225	2	533103	36	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.722	1.715	1	489383	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.622	3.598	2	157460	35	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\071821-DOD.b\071821044.d
Injection Date: 18-Jul-2021 18:14:19 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	960189	944174			98.3	50 - 150
8 PFBA			100.00	101.64	101.6	70 - 130
D 50 13C5_PFPeA	979583	1005620			102.7	50 - 150
21 PFPeA			100.00	107.07	107.1	70 - 130
7 PFBS			88.400	88.008	99.6	70 - 130
D 44 13C3_PFBS	316591	305897			96.6	50 - 150
1 4:2 FTS			93.400	109.97	117.7	70 - 130
D 63 13C2_4:2 FTS_2	251776	243346			96.7	50 - 150
D 49 13C5_PFHxA	862788	854767			99.1	50 - 150
15 PFHxA			100.00	100.22	100.2	70 - 130
22 PFPeS			93.800	99.091	105.6	70 - 130
28 GenX			200.00	227.60	113.8	70 - 130
D 66 13C3_GenX	897310	835132			93.1	50 - 150
D 47 13C4_PFHpA	907666	887911			97.8	50 - 150
13 PFHpA			100.00	109.90	109.9	70 - 130
D 45 13C3_PFHxS	303002	271238			89.5	50 - 150
14 PFHxS			91.000	87.157	95.8	70 - 130
29 ADONA			94.200	96.171	102.1	70 - 130
D 64 13C2_6:2 FTS_2	244810	245663			100.3	50 - 150
2 6:2 FTS			94.800	92.018	97.1	70 - 130
20 PFOA			100.00	103.24	103.2	70 - 130
D 53 13C8_PFOA	921507	921683			100	50 - 150
12 PFHpS			95.200	94.313	99.1	70 - 130
18 PFOS			92.800	91.518	98.6	70 - 130
D 54 13C8_PFOS	232494	226841			97.6	50 - 150
17 PFNA			100.00	100.85	100.9	70 - 130
D 56 13C9_PFNA	901596	917274			101.7	50 - 150
30 9Cl-PF3ONS			93.200	90.543	97.1	70 - 130
D 55 13C8_PFOSA	459073	431715			94	50 - 150
19 PFOSA			100.00	102.75	102.8	70 - 130
16 PFNS			96.000	117.33	122.2	70 - 130
D 65 13C2_8:2 FTS_2	168869	162815			96.4	50 - 150
3 8:2 FTS			95.800	97.831	102.1	70 - 130
10 PFDA			100.00	93.113	93.1	70 - 130
D 51 13C6_PFDA	831393	811905			97.7	50 - 150
6 N-MeFOSAA			100.00	102.40	102.4	70 - 130

Report Date: 19-Jul-2021 15:15:42 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS01.i\071821-DOD.b\071821044.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	941259	1076187			114.3	50 - 150
9 PFDS			96.400	109.29	113.4	70 - 130
25 PFUdA			100.00	93.592	93.6	70 - 130
5 N-EtFOSAA			100.00	97.560	97.6	70 - 130
D 60 d5-EtFOSAA	956597	1043311			109.1	50 - 150
D 52 13C7_PFUdA	803090	785282			97.8	50 - 150
D 61 d7-MeFOSE	176335	165734			94	50 - 150
32 MeFOSE			100.00	112.47	112.5	70 - 130
26 MeFOSA			100.00	118.44	118.4	70 - 130
D 57 d3-MeFOSA	62206	65709			105.6	50 - 150
31 11Cl-PF3OUDS			94.200	92.934	98.7	70 - 130
D 62 d9-EtFOSE	156993	168937			107.6	50 - 150
33 EtFOSE			100.00	93.451	93.5	70 - 130
D 59 d5-EtFOSA	64110	54721			85.4	50 - 150
27 EtFOSA			100.00	77.156	77.2	70 - 130
11 PFDoA			100.00	100.60	100.6	70 - 130
D 38 13C2_PFDoA	788291	779005			98.8	50 - 150
4 10:2 FTS			96.400	124.98	129.7	70 - 130
34 PFDOS			96.800	106.65	110.2	70 - 130
24 PFTrDA			100.00	95.049	95	70 - 130
23 PFTeDA			100.00	103.20	103.2	70 - 130
D 42 13C2_PFTeDA	844286	855857			101.4	50 - 150
D 40 13C2_PFHxDA	524461	583214			111.2	50 - 150
35 PFHxDA			100.00	104.90	104.9	70 - 130
36 PFODA			100.00	91.047	91	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\071821-DOD.b\071821044.d
Injection Date: 18-Jul-2021 18:14:19 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	1	944174	23	>100:1			1000.00	1020.10	98.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.708	0/-1	97241	20	34:1			100.00	101.64		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	1005620	17	>100:1			1000.00	1061.04	102.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	1/0	107430	16	>100:1			100.00	107.07		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	0	305897	17	>100:1			1000.00	1008.22	96.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.131	1/1	37214	16	>100:1	Target = 3.79		88.400	88.008		
298.9 > 99	44	2.120	2.131		9850	15	55:1	3.77 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	1/1	30841	20	>100:1	Target = 3.30		93.800	99.091		
349 > 99	44	2.485	2.476		8877	21	94:1	3.47 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	243346	20	>100:1			5000.00	5313.90	96.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/1	9406	19	>100:1	Target = 1.48		93.400	109.97		
327 > 81	63	2.407	2.407		8417	19	36:1	1.11 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	0	854767	21	>100:1			1000.00	1022.76	99.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	0/0	82964	18	67:1	Target = 16.51		100.00	100.22		
313 > 119	49	2.433	2.441		4013	15	20:1	20.67 (8.25-24.77)					M
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	0	835132	21	>100:1			5000.00	5049.67	93.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	0/0	26531	21	>100:1	Target = 0.69		200.00	227.60		
285 > 185	66	2.563	2.563		34874	20	>100:1	0.76 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.828	2.828	0	887911	20	>100:1			1000.00	983.61	97.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.828	2.828	0/0	89432	19	>100:1	Target = 3.47		100.00	109.90		
363 > 169	47	2.837	2.828		22983	21	80:1	3.89 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.855	2.855	1	271238	20	>100:1			1000.00	999.07	89.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.846	0/-1	26282	29	>100:1	Target = 3.30	0.17	91.000	87.157		
399 > 99	45	2.855	2.846		7748	31	31:1	3.39 (1.65-4.95)	0.08				M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.872	2.872	0/-1	132147	21	>100:1	Target = 2.54		94.200	96.171		
377 > 85	45	2.872	2.872		49145	19	>100:1	2.68 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.235	3.235	0/-1	25104	21	>100:1	Target = 3.54		95.200	94.313		
449 > 99	45	3.242	3.235		7935	28	50:1	3.16 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.204	3.204	0	245663	26	>100:1			5000.00	5530.62	100.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.197	3.197	0/0	13880	22	59:1	Target = 1.46		94.800	92.018		
427 > 81	64	3.197	3.197		9737	21	2.9:1	1.42 (0.73-2.19)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.223	3.223	0	921683	25	>100:1			1000.00	1027.46	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.229	3.229	1/1	95239	25	42:1	Target = 2.72		100.00	103.24		
413 > 169	53	3.229	3.229		32593	21	66:1	2.92 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.602	3.602	0	226841	21	>100:1			1000.00	996.12	97.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.610	3.610	0/0	27377	50	>100:1	Target = 3.88		92.800	91.518		M
499 > 99	54	3.610	3.610		7054	38	31:1	3.88 (1.94-5.83)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.819	3.819	0/0	58953	20	>100:1			93.200	90.543		M
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.947	3.947	0/0	22505	20	>100:1	Target = 3.09		96.000	117.33		
549 > 99	54	3.947	3.947		5265	17	21:1	4.27 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.244	4.244	0/0	24570	18	30:1	Target = 3.32		96.400	109.29		
599 > 99	54	4.253	4.244		6384	15	38:1	3.84 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.399	4.399	0/0	54048	18	>100:1			94.200	92.934		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.743	4.743	0/0	21185	27	>100:1	Target = 3.35		96.800	106.65		
699 > 99	54	4.743	4.743		5828	20	>100:1	3.63 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.617	3.617	1	917274	23	>100:1			1000.00	1031.34	101.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.617	3.617	1/0	78473	21	>100:1	Target = 4.81		100.00	100.85		
463 > 169	56	3.602	3.617		18406	23	84:1	4.26 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.900	3.900	0	431715	20	>100:1			1000.00	957.97	94	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.900	3.900	0/0	45201	19	>100:1	Target = 40.56		100.00	102.75		
498>478	55	3.900	3.900		551	13		82.03 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.955	3.955	1	162815	19	>100:1			5000.00	4994.85	96.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.963	3.963	2/1	5148	14	21:1	Target = 1.50		95.800	97.831		M
527 > 81	65	3.947	3.963		4446	24	35:1	1.15 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.545	4.545	1/0	8057	29	81:1	Target = 2.24		96.400	124.98		
627 > 80	65	4.537	4.545		2184	13	18:1	3.68 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.955	3.955	0	811905	21	>100:1			1000.00	1070.75	97.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.955	3.955	0/0	68800	20	>100:1	Target = 9.65		100.00	93.113		
513 > 169	51	3.955	3.955		5863	24	25:1	11.73 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.109	4.109	0	1076187	19	>100:1			5000.00	5382.35	114.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.117	4.117	0/0	16935	37		Target = 1.47		100.00	102.40		M
570 > 483	58	4.117	4.117		11663	27	37:1	1.45 (0.73-2.21)	0.26				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.263	4.263	0	1043311	20	>100:1			5000.00	5809.53	109.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.263	4.263	0/0	20333	35	>100:1	Target = 1.78		100.00	97.560		M
584 > 526	60	4.281	4.263		12147	37		1.67 (0.89-2.67)	0.20				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.263	4.263	0	785282	18	>100:1			1000.00	1050.76	97.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.263	4.263	0/0	64873	18	>100:1	Target = 9.77		100.00	93.592		
563 > 169	52	4.263	4.263		5562	22	39:1	11.66 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.319	4.319	0	165734	16	>100:1			1000.00	953.33	94	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.328	0/0	16785	15	74:1			100.00	112.47		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.337	4.337	0	65709	17	>100:1			1000.00	1055.40	105.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.347	4.347	0/0	8244	21	48:1	Target = 1.18		100.00	118.44		
512 > 219	57	4.347	4.347		5359	11	34:1	1.53 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.488	4.488	1	168937	27	>100:1			1000.00	1066.31	107.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.496	4.496	0/-1	13208	18	54:1			100.00	93.451		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.505	4.505	1	54721	17	>100:1			1000.00	896.41	85.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.505	4.505	0/-1	4383	16	38:1	Target = 1.11		100.00	77.156		
526 > 219	59	4.513	4.505		5638	25	24:1	0.77 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.529	4.529	0	779005	18	>100:1			1000.00	1006.20	98.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.529	4.529	0/0	75412	18	37:1	Target = 7.48		100.00	100.60		
613 > 169	38	4.521	4.529		11643	19	80:1	6.47 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.773	4.773	1/1	31406	31	>100:1	Target = 3.23		100.00	95.049		
663 > 169	38	4.768	4.773		8387	20	>100:1	3.74 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.987	4.987	1	855857	21	>100:1			1000.00	1035.35	101.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.987	4.987	0/-1	71017	18	12:1	Target = 8.62		100.00	103.20		
713 > 169	42	4.987	4.987		8160	22	99:1	8.70 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.372	5.372	1	583214	19	>100:1			1000.00	1142.90	111.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.372	5.372	0/-1	94143	20	9.5:1	Target = 12.71		100.00	104.90		
813 > 269	40	5.372	5.372		7151	20	>100:1	13.16 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.744	5.744	1/0	64222	24	>100:1	Target = 113.87		100.00	91.047		
913 > 319	40	5.736	5.744		673	22	56:1	95.42 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.955	3.955	0	760568	21	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	0	770522	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.229	3.229	0	933117	26	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.708	0	890503	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.610	3.610	1	230022	25	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\071821-DOD.b\071821045.d
Injection Date: 18-Jul-2021 18:24:53 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	944174	998465			105.8	50 - 150
8 PFBA			200.00	198.85	99.4	70 - 130
D 50 13C5_PFPeA	1005620	995359			99	50 - 150
21 PFPeA			200.00	198.85	99.4	70 - 130
7 PFBS			176.80	178.85	101.2	70 - 130
D 44 13C3_PFBS	305897	315791			103.2	50 - 150
1 4:2 FTS			186.80	240.57	128.8	70 - 130
D 63 13C2_4:2 FTS_2	243346	234441			96.3	50 - 150
D 49 13C5_PFHxA	854767	908219			106.3	50 - 150
15 PFHxA			200.00	192.46	96.2	70 - 130
22 PFPeS			187.60	189.34	100.9	70 - 130
28 GenX			400.00	391.16	97.8	70 - 130
D 66 13C3_GenX	835132	915450			109.6	50 - 150
D 47 13C4_PFHpA	887911	912264			102.7	50 - 150
13 PFHpA			200.00	205.57	102.8	70 - 130
D 45 13C3_PFHxS	271238	270080			99.6	50 - 150
14 PFHxS			182.00	176.39	96.9	70 - 130
29 ADONA			188.40	195.14	103.6	70 - 130
D 64 13C2_6:2 FTS_2	245663	252272			102.7	50 - 150
2 6:2 FTS			189.60	235.63	124.3	70 - 130
20 PFOA			200.00	216.18	108.1	70 - 130
D 53 13C8_PFOA	921683	903212			98	50 - 150
12 PFHpS			190.40	192.92	101.3	70 - 130
18 PFOS			185.60	166.06	89.5	70 - 130
D 54 13C8_PFOS	226841	217075			95.7	50 - 150
17 PFNA			200.00	208.28	104.1	70 - 130
D 56 13C9_PFNA	917274	911091			99.3	50 - 150
30 9Cl-PF3ONS			186.40	195.41	104.8	70 - 130
D 55 13C8_PFOSA	431715	466152			108	50 - 150
19 PFOSA			200.00	189.08	94.5	70 - 130
16 PFNS			192.00	227.41	118.4	70 - 130
D 65 13C2_8:2 FTS_2	162815	186907			114.8	50 - 150
3 8:2 FTS			191.60	199.56	104.2	70 - 130
10 PFDA			200.00	222.05	111	70 - 130
D 51 13C6_PFDA	811905	838061			103.2	50 - 150
6 N-MeFOSAA			200.00	209.40	104.7	70 - 130

Report Date: 19-Jul-2021 15:15:45 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\ll\LCMSMS01.i\071821-DOD.b\071821045.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1076187	1121533			104.2	50 - 150
9 PFDS			192.80	208.85	108.3	70 - 130
25 PFUdA			200.00	203.23	101.6	70 - 130
5 N-EtFOSAA			200.00	204.23	102.1	70 - 130
D 60 d5-EtFOSAA	1043311	1050767			100.7	50 - 150
D 52 13C7_PFUdA	785282	752647			95.8	50 - 150
D 61 d7-MeFOSE	165734	172053			103.8	50 - 150
32 MeFOSE			200.00	220.60	110.3	70 - 130
26 MeFOSA			200.00	236.18	118.1	70 - 130
D 57 d3-MeFOSA	65709	59559			90.6	50 - 150
31 11Cl-PF3OUDS			188.40	193.99	103	70 - 130
D 62 d9-EtFOSE	168937	164787			97.5	50 - 150
33 EtFOSE			200.00	194.49	97.2	70 - 130
D 59 d5-EtFOSA	54721	55493			101.4	50 - 150
27 EtFOSA			200.00	209.27	104.6	70 - 130
11 PFDoA			200.00	195.56	97.8	70 - 130
D 38 13C2_PFDoA	779005	801512			102.9	50 - 150
4 10:2 FTS			192.80	188.88	98	70 - 130
34 PFDOS			193.60	195.52	101	70 - 130
24 PFTrDA			200.00	188.18	94.1	70 - 130
23 PFTeDA			200.00	195.88	97.9	70 - 130
D 42 13C2_PFTeDA	855857	879572			102.8	50 - 150
D 40 13C2_PFHxDA	583214	584047			100.1	50 - 150
35 PFHxDA			200.00	197.25	98.6	70 - 130
36 PFODA			200.00	186.02	93	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\071821-DOD.b\071821045.d
Injection Date: 18-Jul-2021 18:24:53 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	0	998465	22	>100:1			1000.00	1078.75	105.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.708	0/0	201181	22	73:1			200.00	198.85		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	0	995359	18	>100:1			1000.00	1050.22	99	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	0/0	197478	18	>100:1			200.00	198.85		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	0	315791	18	>100:1			1000.00	1040.83	103.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.131	0/0	78071	19	>100:1	Target = 3.79		176.80	178.85		
298.9 > 99	44	2.131	2.131		20501	15	>100:1	3.80 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	0/0	60835	19	>100:1	Target = 3.30		187.60	189.34		
349 > 99	44	2.476	2.476		20475	27	>100:1	2.97 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	234441	19	>100:1			5000.00	5119.45	96.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.407	0/0	19823	22	>100:1	Target = 1.48		186.80	240.57		
327 > 81	63	2.407	2.407		12612	21	50:1	1.57 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	0	908219	20	>100:1			1000.00	1086.72	106.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	0/0	169289	20	>100:1	Target = 16.51		200.00	192.46		
313 > 119	49	2.441	2.441		9554	19	35:1	17.71 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	0	915450	21	>100:1			5000.00	5535.32	109.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	0/0	49982	21	>100:1	Target = 0.69		400.00	391.16		
285 > 185	66	2.563	2.563		72721	22	>100:1	0.68 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.837	2.828	1	912264	20	>100:1			1000.00	1010.58	102.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.837	2.828	1/0	171882	19	>100:1	Target = 3.47		200.00	205.57		
363 > 169	47	2.837	2.828		50974	20	>100:1	3.37 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.855	0	270080	22	>100:1			1000.00	994.80	99.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.846	0/0	52964	28	>100:1	Target = 3.30	0.20	182.00	176.39		
399 > 99	45	2.846	2.846		17785	25	93:1	2.97 (1.65-4.95)	0.07				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.872	2.872	0/0	266988	22	>100:1	Target = 2.54		188.40	195.14		
377 > 85	45	2.872	2.872		103630	20	>100:1	2.57 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.234	3.235	0/0	51131	28	>100:1	Target = 3.54		190.40	192.92		
449 > 99	45	3.234	3.235		14453	20	>100:1	3.53 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.202	3.204	0	252272	26	>100:1			5000.00	5679.41	102.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.208	3.197	1/1	26927	33	68:1	Target = 1.46		189.60	235.63		
427 > 81	64	3.202	3.197		18271	33	86:1	1.47 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.227	3.223	1	903212	24	>100:1			1000.00	1006.87	98	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.234	3.229	1/0	195437	26	>100:1	Target = 2.72		200.00	216.18		
413 > 169	53	3.234	3.229		63713	22	>100:1	3.06 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.606	3.602	1	217075	22	>100:1			1000.00	953.23	95.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.614	3.610	1/0	43934	36	>100:1	Target = 3.88	0.27	185.60	166.06		
499 > 99	54	3.614	3.610		12465	37		3.52 (1.94-5.83)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.817	3.819	0/-1	121755	21	>100:1			186.40	195.41		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.945	3.947	0/-1	41742	24	>100:1	Target = 3.09		192.00	227.41		
549 > 99	54	3.945	3.947		13369	17	98:1	3.12 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.241	4.244	0/-1	44932	17	>100:1	Target = 3.32		192.80	208.85		
599 > 99	54	4.251	4.244		12105	22	69:1	3.71 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.396	4.399	0/-1	107960	16	>100:1			188.40	193.99		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.742	4.743	0/-1	37166	19	>100:1	Target = 3.35		193.60	195.52		
699 > 99	54	4.742	4.743		9871	17	>100:1	3.76 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.614	3.617	0	911091	21	>100:1			1000.00	1024.39	99.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.614	3.617	0/0	160966	23	>100:1	Target = 4.81		200.00	208.28		
463 > 169	56	3.614	3.617		31454	19	>100:1	5.11 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.899	3.900	0	466152	21	>100:1			1000.00	1034.38	108	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.899	3.900	0/0	89813	18	>100:1	Target = 40.56		200.00	189.08		
498>478	55	3.891	3.900		1699	15	12:1	52.86 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.945	3.955	0	186907	21	>100:1			5000.00	5733.95	114.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.953	3.963	1/1	12055	16	59:1	Target = 1.50		191.60	199.56		
527 > 81	65	3.953	3.963		7368	24	25:1	1.63 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.543	4.545	0/0	13978	19	>100:1	Target = 2.24		192.80	188.88		
627 > 80	65	4.535	4.545		6237	20	42:1	2.24 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.962	3.955	1	838061	21	>100:1			1000.00	1105.24	103.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.962	3.955	1/0	169353	20	>100:1	Target = 9.65		200.00	222.05		
513 > 169	51	3.953	3.955		16578	22	50:1	10.21 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.115	4.109	1	1121533	20	>100:1			5000.00	5609.13	104.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.115	4.117	0/-1	36090	34	>100:1	Target = 1.47	0.14	200.00	209.40		M
570 > 483	58	4.107	4.117		22337	33	>100:1	1.61 (0.73-2.21)	0.18				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.270	4.263	1	1050767	18	>100:1			5000.00	5851.05	100.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.270	4.263	1/0	42869	37	>100:1	Target = 1.78	0.08	200.00	204.23		M
584 > 526	60	4.270	4.263		23814	35	>100:1	1.80 (0.89-2.67)	0.09				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.270	4.263	1	752647	18	>100:1			1000.00	1007.10	95.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.270	4.263	1/0	135016	18	>100:1	Target = 9.77		200.00	203.23		
563 > 169	52	4.260	4.263		11771	24	80:1	11.47 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.316	4.319	0	172053	16	>100:1			1000.00	989.68	103.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.334	4.328	1/1	34177	19	>100:1			200.00	220.60		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.344	4.337	1	59559	15	>100:1			1000.00	956.62	90.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.334	4.347	0/-1	14901	22	58:1	Target = 1.18		200.00	236.18		
512 > 219	57	4.344	4.347		12183	22	53:1	1.22 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.486	4.488	0	164787	21	>100:1			1000.00	1040.12	97.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.494	4.496	0/0	26813	19	95:1			200.00	194.49		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.502	4.505	0	55493	17	>100:1			1000.00	909.06	101.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.510	4.505	1/1	12056	18	97:1	Target = 1.11		200.00	209.27		
526 > 219	59	4.510	4.505		12466	16	51:1	0.96 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.527	4.529	0	801512	18	>100:1			1000.00	1035.27	102.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.535	4.529	1/1	150831	17	79:1	Target = 7.48		200.00	195.56		
613 > 169	38	4.535	4.529		16865	18	>100:1	8.94 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.766	4.773	0/0	63974	30	>100:1	Target = 3.23		200.00	188.18		
663 > 169	38	4.766	4.773		21206	23	>100:1	3.01 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.983	4.987	0	879572	19	>100:1			1000.00	1064.04	102.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.990	4.987	1/1	138534	18	21:1	Target = 8.62		200.00	195.88		
713 > 169	42	4.983	4.987		14512	21	>100:1	9.54 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.369	5.372	0	584047	20	>100:1			1000.00	1144.54	100.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.378	5.372	1/1	177267	20	17:1	Target = 12.71		200.00	197.25		
813 > 269	40	5.369	5.372		13243	21	>100:1	13.38 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.740	5.744	0/0	131399	25	13:1	Target = 113.87		200.00	186.02		
913 > 319	40	5.747	5.744		1348	24	93:1	97.47 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.962	3.955	1	823941	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	0	835341	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.227	3.229	0	901117	26	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.708	0	941952	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.606	3.610	0	235335	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072021-DOD.b\072021005.d
Injection Date: 20-Jul-2021 11:21:14 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	960189	1009568			105.1	50 - 150
8 PFBA			100.00	100.19	100.2	70 - 130
D 50 13C5_PFPeA	979583	1021182			104.2	50 - 150
21 PFPeA			100.00	106.28	106.3	70 - 130
7 PFBS			88.400	95.341	107.9	70 - 130
D 44 13C3_PFBS	316591	308799			97.5	50 - 150
1 4:2 FTS			93.400	105.40	112.8	70 - 130
D 63 13C2_4:2 FTS_2	251776	271620			107.9	50 - 150
D 49 13C5_PFHxA	862788	918709			106.5	50 - 150
15 PFHxA			100.00	107.23	107.2	70 - 130
22 PFPeS			93.800	93.055	99.2	70 - 130
28 GenX			200.00	225.59	112.8	70 - 130
D 66 13C3_GenX	897310	843103			94	50 - 150
D 47 13C4_PFHpA	907666	982690			108.3	50 - 150
13 PFHpA			100.00	103.51	103.5	70 - 130
D 45 13C3_PFHxS	303002	272229			89.8	50 - 150
14 PFHxS			91.000	88.644	97.4	70 - 130
29 ADONA			94.200	99.665	105.8	70 - 130
D 64 13C2_6:2 FTS_2	244810	237522			97	50 - 150
2 6:2 FTS			94.800	113.01	119.2	70 - 130
20 PFOA			100.00	103.50	103.5	70 - 130
D 53 13C8_PFOA	921507	998346			108.3	50 - 150
12 PFHpS			95.200	98.143	103.1	70 - 130
18 PFOS			92.800	77.407	83.4	70 - 130
D 54 13C8_PFOS	232494	240104			103.3	50 - 150
17 PFNA			100.00	106.70	106.7	70 - 130
D 56 13C9_PFNA	901596	976903			108.4	50 - 150
30 9Cl-PF3ONS			93.200	85.482	91.7	70 - 130
D 55 13C8_PFOSA	459073	447799			97.5	50 - 150
19 PFOSA			100.00	105.29	105.3	70 - 130
16 PFNS			96.000	111.94	116.6	70 - 130
D 65 13C2_8:2 FTS_2	168869	186515			110.4	50 - 150
3 8:2 FTS			95.800	82.978	86.6	70 - 130
10 PFDA			100.00	103.33	103.3	70 - 130
D 51 13C6_PFDA	831393	931589			112.1	50 - 150
6 N-MeFOSAA			100.00	103.97	104	70 - 130

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.714	1.714	1	967231	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.610	3.610	0	250699	22	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072021-DOD.b\072021006.d
Injection Date: 20-Jul-2021 11:31:46 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1009568	998177			98.9	50 - 150
8 PFBA			200.00	205.65	102.8	70 - 130
D 50 13C5_PFPeA	1021182	1029442			100.8	50 - 150
21 PFPeA			200.00	198.56	99.3	70 - 130
7 PFBS			176.80	174.33	98.6	70 - 130
D 44 13C3_PFBS	308799	321811			104.2	50 - 150
1 4:2 FTS			186.80	213.55	114.3	70 - 130
D 63 13C2_4:2 FTS_2	271620	299347			110.2	50 - 150
D 49 13C5_PFHxA	918709	934123			101.7	50 - 150
15 PFHxA			200.00	193.34	96.7	70 - 130
22 PFPeS			187.60	178.14	95	70 - 130
28 GenX			400.00	424.75	106.2	70 - 130
D 66 13C3_GenX	843103	848435			100.6	50 - 150
D 47 13C4_PFHpA	982690	980662			99.8	50 - 150
13 PFHpA			200.00	181.27	90.6	70 - 130
D 45 13C3_PFHxS	272229	286447			105.2	50 - 150
14 PFHxS			182.00	168.10	92.4	70 - 130
29 ADONA			188.40	192.95	102.4	70 - 130
D 64 13C2_6:2 FTS_2	237522	236811			99.7	50 - 150
2 6:2 FTS			189.60	220.18	116.1	70 - 130
20 PFOA			200.00	194.10	97	70 - 130
D 53 13C8_PFOA	998346	995099			99.7	50 - 150
12 PFHpS			190.40	189.41	99.5	70 - 130
18 PFOS			185.60	190.00	102.4	70 - 130
D 54 13C8_PFOS	240104	235623			98.1	50 - 150
17 PFNA			200.00	205.65	102.8	70 - 130
D 56 13C9_PFNA	976903	978111			100.1	50 - 150
30 9Cl-PF3ONS			186.40	183.64	98.5	70 - 130
D 55 13C8_PFOSA	447799	469265			104.8	50 - 150
19 PFOSA			200.00	190.21	95.1	70 - 130
16 PFNS			192.00	214.55	111.7	70 - 130
D 65 13C2_8:2 FTS_2	186515	182594			97.9	50 - 150
3 8:2 FTS			191.60	198.05	103.4	70 - 130
10 PFDA			200.00	202.06	101	70 - 130
D 51 13C6_PFDA	931589	906403			97.3	50 - 150
6 N-MeFOSAA			200.00	196.32	98.2	70 - 130

Report Date: 21-Jul-2021 13:52:12 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072021-DOD.b\072021006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1184765	1189121			100.4	50 - 150
9 PFDS			192.80	206.28	107	70 - 130
25 PFUdA			200.00	187.71	93.9	70 - 130
5 N-EtFOSAA			200.00	186.30	93.2	70 - 130
D 60 d5-EtFOSAA	1027799	1049694			102.1	50 - 150
D 52 13C7_PFUdA	784621	815493			103.9	50 - 150
D 61 d7-MeFOSE	174430	164609			94.4	50 - 150
32 MeFOSE			200.00	196.43	98.2	70 - 130
26 MeFOSA			200.00	218.44	109.2	70 - 130
D 57 d3-MeFOSA	54795	61794			112.8	50 - 150
31 11Cl-PF3OUDS			188.40	189.46	100.6	70 - 130
D 62 d9-EtFOSE	161103	151446			94	50 - 150
33 EtFOSE			200.00	198.34	99.2	70 - 130
D 59 d5-EtFOSA	57847	60600			104.8	50 - 150
27 EtFOSA			200.00	208.61	104.3	70 - 130
11 PFDoA			200.00	208.56	104.3	70 - 130
D 38 13C2_PFDoA	831616	810122			97.4	50 - 150
4 10:2 FTS			192.80	165.03	85.6	70 - 130
34 PFDOS			193.60	204.49	105.6	70 - 130
24 PFTrDA			200.00	194.85	97.4	70 - 130
23 PFTeDA			200.00	191.26	95.6	70 - 130
D 42 13C2_PFTeDA	861889	858367			99.6	50 - 150
D 40 13C2_PFHxDA	545538	583355			106.9	50 - 150
35 PFHxDA			200.00	201.42	100.7	70 - 130
36 PFODA			200.00	191.51	95.8	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072021-DOD.b\072021006.d
Injection Date: 20-Jul-2021 11:31:46 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	1	998177	22	>100:1			1000.00	1078.44	98.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.714	1/0	208005	21	77:1			200.00	205.65		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.079	2.078	1	1029442	19	>100:1			1000.00	1086.18	100.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.079	2.078	1/0	203935	17	>100:1			200.00	198.56		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.131	1	321811	17	>100:1			1000.00	1060.67	104.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.131	1/0	77549	18	>100:1	Target = 3.79		176.80	174.33		
298.9 > 99	44	2.131	2.131		21235	18	>100:1	3.65 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.485	2.485	1/0	58330	20	>100:1	Target = 3.30		187.60	178.14		
349 > 99	44	2.485	2.485		18658	20	>100:1	3.12 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.407	1	299347	22	>100:1			5000.00	6536.79	110.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	22468	19	>100:1	Target = 1.48		186.80	213.55		
327 > 81	63	2.407	2.407		10622	11	93:1	2.11 (0.74-2.22)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.450	0	934123	20	>100:1			1000.00	1117.71	101.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.450	1/1	174920	21	>100:1	Target = 16.51		200.00	193.34		
313 > 119	49	2.450	2.450		9644	19	33:1	18.13 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.572	2.563	1	848435	20	>100:1			5000.00	5130.11	100.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.572	2.571	1/0	50301	20	>100:1	Target = 0.69		400.00	424.75		
285 > 185	66	2.572	2.571		67033	18	>100:1	0.75 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.837	2.837	1	980662	21	>100:1			1000.00	1086.35	99.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.837	2.837	1/0	162929	19	>100:1	Target = 3.47		200.00	181.27		
363 > 169	47	2.837	2.837		51564	22	>100:1	3.15 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.855	2.855	1	286447	22	>100:1			1000.00	1055.09	105.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.855	2.855	1/0	53532	33	>100:1	Target = 3.30	0.16	182.00	168.10		
399 > 99	45	2.855	2.855		18561	31	>100:1	2.88 (1.65-4.95)	0.08				M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.881	2.881	1/0	279991	20	>100:1	Target = 2.54		188.40	192.95		
377 > 85	45	2.881	2.881		119061	23	>100:1	2.35 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.239	3.242	0/-1	53244	24	>100:1	Target = 3.54		190.40	189.41		
449 > 99	45	3.239	3.242		14728	44	83:1	3.61 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.208	3.210	0	236811	25	>100:1			5000.00	5331.33	99.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.214	3.217	0/0	23997	24	86:1	Target = 1.46		189.60	220.18		
427 > 81	64	3.208	3.217		17477	31	74:1	1.37 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.233	3.236	0	995099	25	>100:1			1000.00	1109.30	99.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.233	3.236	0/0	193325	22	>100:1	Target = 2.72		200.00	194.10		
413 > 169	53	3.233	3.236		61873	20	>100:1	3.12 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.613	3.610	1	235623	26	>100:1			1000.00	1034.68	98.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.613	3.610	1/0	53872	44	>100:1	Target = 3.88	0.28	185.60	190.00		
499 > 99	54	3.613	3.610		13861	34	>100:1	3.88 (1.94-5.83)	0.12				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.817	3.826	0/-1	124201	23	>100:1			186.40	183.64		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.952	3.947	1/0	42747	19	>100:1	Target = 3.09		192.00	214.55		
549 > 99	54	3.944	3.947		12668	15	54:1	3.37 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.250	4.254	0/-1	48171	20	>100:1	Target = 3.32		192.80	206.28		
599 > 99	54	4.260	4.254		13315	24	62:1	3.61 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.404	4.407	0/-1	114448	19	>100:1			188.40	189.46		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.748	4.750	0/-1	42193	27	>100:1	Target = 3.35		193.60	204.49		
699 > 99	54	4.748	4.750		12200	29	>100:1	3.45 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.613	3.618	0	978111	22	>100:1			1000.00	1099.74	100.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.621	3.610	1/1	170628	21	>100:1	Target = 4.81		200.00	205.65		
463 > 169	56	3.613	3.610		33463	19	>100:1	5.09 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.898	3.901	0	469265	21	>100:1			1000.00	1041.29	104.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.898	3.901	0/0	90952	16	>100:1	Target = 40.56		200.00	190.21		M
498>478	55	3.906	3.901		2276	13	21:1	39.96 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.952	3.955	0	182594	19				5000.00	5601.63	97.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.961	3.972	0/0	11688	21	48:1	Target = 1.50		191.60	198.05		
527 > 81	65	3.952	3.972		9787	27	63:1	1.19 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.551	4.537	1/1	11931	22	>100:1	Target = 2.24		192.80	165.03		
627 > 80	65	4.543	4.537		5761	38	60:1	2.07 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.961	3.964	0	906403	21	>100:1			1000.00	1195.37	97.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.961	3.964	0/0	166680	20	>100:1	Target = 9.65		200.00	202.06		
513 > 169	51	3.961	3.964		17022	23	65:1	9.79 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.114	4.126	0	1189121	20	>100:1			5000.00	5947.16	100.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.122	4.118	1/1	35876	40		Target = 1.47	0.08	200.00	196.32		M
570 > 483	58	4.131	4.118		26311	35	97:1	1.36 (0.73-2.21)	0.22				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.269	4.273	0	1049694	18	>100:1			5000.00	5845.07	102.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.269	4.291	-1/-1	39066	37	>100:1	Target = 1.78		200.00	186.30		M
584 > 526	60	4.279	4.291		23508	33	90:1	1.66 (0.89-2.67)	0.27				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.269	4.273	0	815493	17	>100:1			1000.00	1091.19	103.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.269	4.273	0/0	135120	15	>100:1	Target = 9.77		200.00	187.71		
563 > 169	52	4.269	4.273		17119	14	75:1	7.89 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.316	4.319	0	164609	20	>100:1			1000.00	946.86	94.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.334	4.337	0/0	29115	16	62:1			200.00	196.43		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.334	4.337	0	61794	18	73:1			1000.00	992.52	112.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.343	4.347	0/0	14299	16	49:1	Target = 1.18		200.00	218.44		
512 > 219	57	4.343	4.347		14724	21	49:1	0.97 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.477	4.480	0	151446	18	>100:1			1000.00	955.91	94	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.494	4.488	1/1	25130	12	91:1			200.00	198.34		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.502	4.497	1	60600	23	>100:1			1000.00	992.72	104.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.510	4.513	0/-1	13124	18	61:1	Target = 1.11		200.00	208.61		
526 > 219	59	4.502	4.513		11356	16	61:1	1.15 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.537	0	810122	20	>100:1			1000.00	1046.39	97.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.543	4.537	1/1	162587	17	94:1	Target = 7.48		200.00	208.56		
613 > 169	38	4.535	4.537		18840	18	>100:1	8.62 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.772	4.773	0/0	66953	24	>100:1	Target = 3.23		200.00	194.85		M
663 > 169	38	4.772	4.773		22024	29	>100:1	3.04 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.990	4.994	0	858367	20	>100:1			1000.00	1038.39	99.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.990	4.994	0/0	132005	20	19:1	Target = 8.62		200.00	191.26		
713 > 169	42	4.996	4.994		14714	23	>100:1	8.97 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.377	5.381	0	583355	19	>100:1			1000.00	1143.18	106.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.386	5.381	1/1	180800	21	19:1	Target = 12.71		200.00	201.42		
813 > 269	40	5.386	5.381		13832	23	>100:1	13.07 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.754	5.766	0/0	135118	26	15:1	Target = 113.87		200.00	191.51		
913 > 319	40	5.754	5.766		1292	30	90:1	104.58 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.961	3.964	0	848607	21	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.450	1	876923	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.233	3.229	1	984758	25	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.715	1.714	1	948664	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.613	3.610	1	235268	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072021-DOD.b\072021021.d
Injection Date: 20-Jul-2021 14:37:24 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 13
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1009568	1064069			105.4	50 - 150
8 PFBA			1000.00	925.80	92.6	70 - 130
D 50 13C5_PFPeA	1021182	1042982			102.1	50 - 150
21 PFPeA			1000.00	946.16	94.6	70 - 130
7 PFBS			884.00	809.48	91.6	70 - 130
D 44 13C3_PFBS	308799	330680			107.1	50 - 150
1 4:2 FTS			934.00	1018.17	109	70 - 130
D 63 13C2_4:2 FTS_2	271620	258061			95	50 - 150
D 49 13C5_PFHxA	918709	977033			106.3	50 - 150
15 PFHxA			1000.00	905.83	90.6	70 - 130
22 PFPeS			938.00	783.33	83.5	70 - 130
28 GenX			2000.00	2207.35	110.4	70 - 130
D 66 13C3_GenX	843103	699308			82.9	50 - 150
D 47 13C4_PFHpA	982690	1008869			102.7	50 - 150
13 PFHpA			1000.00	939.95	94	70 - 130
D 45 13C3_PFHxS	272229	287685			105.7	50 - 150
14 PFHxS			910.00	919.90	101.1	70 - 130
29 ADONA			942.00	907.32	96.3	70 - 130
D 64 13C2_6:2 FTS_2	237522	254173			107	50 - 150
2 6:2 FTS			948.00	941.85	99.4	70 - 130
20 PFOA			1000.00	923.12	92.3	70 - 130
D 53 13C8_PFOA	998346	1063466			106.5	50 - 150
12 PFHpS			952.00	833.93	87.6	70 - 130
18 PFOS			928.00	840.57	90.6	70 - 130
D 54 13C8_PFOS	240104	244630			101.9	50 - 150
17 PFNA			1000.00	817.98	81.8	70 - 130
D 56 13C9_PFNA	976903	1164048			119.2	50 - 150
30 9Cl-PF3ONS			932.00	850.16	91.2	70 - 130
D 55 13C8_PFOSA	447799	418169			93.4	50 - 150
19 PFOSA			1000.00	1010.16	101	70 - 130
16 PFNS			960.00	933.34	97.2	70 - 130
D 65 13C2_8:2 FTS_2	186515	193128			103.5	50 - 150
3 8:2 FTS			958.00	975.09	101.8	70 - 130
10 PFDA			1000.00	961.70	96.2	70 - 130
D 51 13C6_PFDA	931589	911248			97.8	50 - 150
6 N-MeFOSAA			1000.00	1038.07	103.8	70 - 130

Report Date: 21-Jul-2021 13:52:14 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072021-DOD.b\072021021.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1184765	995737			84	50 - 150
9 PFDS			964.00	839.88	87.1	70 - 130
25 PFUdA			1000.00	941.79	94.2	70 - 130
5 N-EtFOSAA			1000.00	910.22	91	70 - 130
D 60 d5-EtFOSAA	1027799	986478			96	50 - 150
D 52 13C7_PFUdA	784621	873539			111.3	50 - 150
D 61 d7-MeFOSE	174430	137086			78.6	50 - 150
32 MeFOSE			1000.00	1146.42	114.6	70 - 130
26 MeFOSA			1000.00	1168.59	116.9	70 - 130
D 57 d3-MeFOSA	54795	53758			98.1	50 - 150
31 11Cl-PF3OUDS			942.00	822.53	87.3	70 - 130
D 62 d9-EtFOSE	161103	142672			88.6	50 - 150
33 EtFOSE			1000.00	955.99	95.6	70 - 130
D 59 d5-EtFOSA	57847	54339			93.9	50 - 150
27 EtFOSA			1000.00	1057.39	105.7	70 - 130
11 PFDoA			1000.00	890.46	89	70 - 130
D 38 13C2_PFDoA	831616	826347			99.4	50 - 150
4 10:2 FTS			964.00	843.63	87.5	70 - 130
34 PFDOS			968.00	849.21	87.7	70 - 130
24 PFTrDA			1000.00	845.23	84.5	70 - 130
23 PFTeDA			1000.00	925.70	92.6	70 - 130
D 42 13C2_PFTeDA	861889	832625			96.6	50 - 150
D 40 13C2_PFHxDA	545538	448175			82.2	50 - 150
35 PFHxDA			1000.00	1011.22	101.1	70 - 130
36 PFODA			1000.00	987.16	98.7	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072021-DOD.b\072021021.d
Injection Date: 20-Jul-2021 14:37:24 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 13
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.708	0	1064069	23	>100:1			1000.00	1149.63	105.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.714	0/0	998200	22	>100:1			1000.00	925.80		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.078	0	1042982	18	>100:1			1000.00	1100.46	102.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.078	0/0	984583	18	>100:1			1000.00	946.16		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.131	-1	330680	17	>100:1			1000.00	1089.91	107.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.131	-1/0	370018	17	>100:1	Target = 3.79		884.00	809.48		
298.9 > 99	44	2.118	2.131		101377	17	>100:1	3.64 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.475	2.485	-1/0	263554	22	>100:1	Target = 3.30		938.00	783.33		
349 > 99	44	2.466	2.485		92692	20	>100:1	2.84 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.407	-1	258061	20	>100:1			5000.00	5635.23	95	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.407	-1/0	92351	22	>100:1	Target = 1.48		934.00	1018.17		
327 > 81	63	2.397	2.407		58243	22	>100:1	1.58 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.431	2.450	-1	977033	19	>100:1			1000.00	1169.05	106.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.440	2.450	-1/0	857157	20	>100:1	Target = 16.51		1000.00	905.83		
313 > 119	49	2.440	2.450		53832	20	>100:1	15.92 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.563	-1	699308	19	>100:1			5000.00	4228.41	82.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.571	-1/0	215459	21	>100:1	Target = 0.69		2000.00	2207.35		
285 > 185	66	2.553	2.571		291724	22	>100:1	0.73 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.837	-2	1008869	21	>100:1			1000.00	1117.60	102.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.837	-2/0	869131	21	>100:1	Target = 3.47		1000.00	939.95		
363 > 169	47	2.818	2.837		252527	20	>100:1	3.44 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.855	-1	287685	22	>100:1			1000.00	1059.65	105.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.855	-1/0	294213	27	>100:1	Target = 3.30	0.15	910.00	919.90		
399 > 99	45	2.827	2.855		76457	29	>100:1	3.84 (1.65-4.95)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.881	-1/0	1322332	18	>100:1	Target = 2.54		942.00	907.32		
377 > 85	45	2.862	2.881		513367	20	>100:1	2.57 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.214	3.242	-2/-1	235434	25	>100:1	Target = 3.54		952.00	833.93		
449 > 99	45	3.214	3.242		67850	25	>100:1	3.46 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.183	3.210	-2	254173	25	>100:1			5000.00	5722.20	107	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.183	3.217	-2/0	89922	26	>100:1	Target = 1.46		948.00	941.85		
427 > 81	64	3.183	3.217		59167	25	>100:1	1.51 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.236	-2	1063466	26	>100:1			1000.00	1185.51	106.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.236	-2/0	982615	29	>100:1	Target = 2.72		1000.00	923.12		
413 > 169	53	3.208	3.236		353405	25	>100:1	2.78 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.578	3.610	-3	244630	23	>100:1			1000.00	1074.23	101.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.578	3.610	-1/2	230378	45	>100:1	Target = 3.88		928.00	840.57		M
499 > 99	54	3.585	3.610		60728	40	>100:1	3.79 (1.94-5.83)	0.07				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.789	3.826	-2/1	596952	20	>100:1			932.00	850.16		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.915	3.947	-3/0	193065	28	>100:1	Target = 3.09		960.00	933.34		
549 > 99	54	3.915	3.947		59696	20	>100:1	3.23 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.216	4.254	-3/0	203631	19	>100:1	Target = 3.32		964.00	839.88		
599 > 99	54	4.216	4.254		67054	18	>100:1	3.03 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.373	4.407	-3/0	515879	17	>100:1			942.00	822.53		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.714	4.750	-3/0	181914	21	>100:1	Target = 3.35		968.00	849.21		
699 > 99	54	4.714	4.750		55063	22	>100:1	3.30 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.618	-3	1164048	22	>100:1			1000.00	1308.80	119.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.585	3.610	-3/0	807687	23	>100:1	Target = 4.81		1000.00	817.98		
463 > 169	56	3.585	3.610		159639	28	>100:1	5.05 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.862	3.901	-2	418169	20	>100:1			1000.00	927.91	93.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.862	3.901	-2/0	430427	22	>100:1	Target = 40.56		1000.00	1010.16		
498>478	55	3.877	3.901		12819	23	64:1	33.57 (20.28-60.84)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.923	3.955	-2	193128	28	>100:1			5000.00	5924.80	103.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.923	3.972	-3/-1	60864	20	>100:1	Target = 1.50		958.00	975.09		
527 > 81	65	3.923	3.972		42432	24	>100:1	1.43 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.513	4.537	-3/-1	64509	19	>100:1	Target = 2.24		964.00	843.63		
627 > 80	65	4.513	4.537		28005	19	>100:1	2.30 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.931	3.964	-2	911248	21	>100:1			1000.00	1201.76	97.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.931	3.964	-2/0	797535	22	>100:1	Target = 9.65		1000.00	961.70		
513 > 169	51	3.931	3.964		74348	21	>100:1	10.72 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.085	4.126	-2	995737	18	>100:1			5000.00	4979.99	84	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.085	4.118	-1/1	158846	39	>100:1	Target = 1.47		1000.00	1038.07		M
570 > 483	58	4.085	4.118		121484	40	>100:1	1.30 (0.73-2.21)					M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.235	4.273	-3	986478	18	>100:1			5000.00	5493.06	96	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.244	4.291	-2/1	179371	37	>100:1	Target = 1.78		1000.00	910.22		M
584 > 526	60	4.244	4.291		106125	33	>100:1	1.69 (0.89-2.67)	0.09				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.235	4.273	-3	873539	18	>100:1			1000.00	1168.86	111.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.235	4.273	-3/0	726172	18	>100:1	Target = 9.77		1000.00	941.79		
563 > 169	52	4.235	4.273		77475	17	>100:1	9.37 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.319	-2	137086	16	>100:1			1000.00	788.54	78.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.337	-2/0	141514	17	>100:1			1000.00	1146.42		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.300	4.337	-2	53758	17	>100:1			1000.00	863.45	98.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.300	4.347	-2/0	66547	18	95:1	Target = 1.18		1000.00	1168.59		
512 > 219	57	4.310	4.347		52162	17	>100:1	1.27 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.442	4.480	-2	142672	20	>100:1			1000.00	900.53	88.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.449	4.488	-2/0	114109	19	>100:1			1000.00	955.99		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.497	-2	54339	20	>100:1			1000.00	890.16	93.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.472	4.513	-2/0	59648	17	>100:1	Target = 1.11		1000.00	1057.39		
526 > 219	59	4.472	4.513		54443	19	>100:1	1.09 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.505	4.537	-3	826347	19	>100:1			1000.00	1067.34	99.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.505	4.537	-3/0	708072	20	>100:1	Target = 7.48		1000.00	890.46		
613 > 169	38	4.505	4.537		88457	19	>100:1	8.00 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.744	4.773	-1/2	296251	23	>100:1	Target = 3.23		1000.00	845.23		
663 > 169	38	4.744	4.773		96901	24	>100:1	3.05 (1.61-4.85)					M
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.965	4.994	-3	832625	19	>100:1			1000.00	1007.25	96.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.965	4.994	-3/0	619749	21	95:1	Target = 8.62		1000.00	925.70		
713 > 169	42	4.965	4.994		65058	19	>100:1	9.52 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.356	5.381	-3	448175	20	>100:1			1000.00	878.27	82.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.356	5.381	-3/0	697367	19	76:1	Target = 12.71		1000.00	1011.22		
813 > 269	40	5.356	5.381		53675	20	>100:1	12.99 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.729	5.766	-4/-1	535084	25	69:1	Target = 113.87		1000.00	987.16		
913 > 319	40	5.729	5.766		4915	31	>100:1	108.86 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.931	3.964	-2	819562	21	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.431	2.450	-1	879227	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.229	-2	1015158	26	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.714	0	947770	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.578	3.610	-3	237702	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072021-DOD.b\072021036.d
Injection Date: 20-Jul-2021 17:16:15 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 27
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1009568	990803			98.1	50 - 150
8 PFBA			1000.00	905.74	90.6	70 - 130
D 50 13C5_PFPeA	1021182	1021012			100	50 - 150
21 PFPeA			1000.00	909.54	91	70 - 130
7 PFBS			884.00	821.44	92.9	70 - 130
D 44 13C3_PFBS	308799	313845			101.6	50 - 150
1 4:2 FTS			934.00	1086.01	116.3	70 - 130
D 63 13C2_4:2 FTS_2	271620	237448			87.4	50 - 150
D 49 13C5_PFHxA	918709	938299			102.1	50 - 150
15 PFHxA			1000.00	840.19	84	70 - 130
22 PFPeS			938.00	800.94	85.4	70 - 130
28 GenX			2000.00	2295.01	114.8	70 - 130
D 66 13C3_GenX	843103	687812			81.6	50 - 150
D 47 13C4_PFHpA	982690	957295			97.4	50 - 150
13 PFHpA			1000.00	958.13	95.8	70 - 130
D 45 13C3_PFHxS	272229	277214			101.8	50 - 150
14 PFHxS			910.00	807.27	88.7	70 - 130
29 ADONA			942.00	901.67	95.7	70 - 130
D 64 13C2_6:2 FTS_2	237522	227673			95.9	50 - 150
2 6:2 FTS			948.00	1084.34	114.4	70 - 130
20 PFOA			1000.00	906.71	90.7	70 - 130
D 53 13C8_PFOA	998346	959895			96.1	50 - 150
12 PFHpS			952.00	810.45	85.1	70 - 130
18 PFOS			928.00	839.84	90.5	70 - 130
D 54 13C8_PFOS	240104	225395			93.9	50 - 150
17 PFNA			1000.00	883.75	88.4	70 - 130
D 56 13C9_PFNA	976903	1009020			103.3	50 - 150
30 9Cl-PF3ONS			932.00	883.60	94.8	70 - 130
D 55 13C8_PFOSA	447799	403157			90	50 - 150
19 PFOSA			1000.00	1017.40	101.7	70 - 130
16 PFNS			960.00	909.06	94.7	70 - 130
D 65 13C2_8:2 FTS_2	186515	161338			86.5	50 - 150
3 8:2 FTS			958.00	1070.82	111.8	70 - 130
10 PFDA			1000.00	857.91	85.8	70 - 130
D 51 13C6_PFDA	931589	897731			96.4	50 - 150
6 N-MeFOSAA			1000.00	985.72	98.6	70 - 130

Report Date: 21-Jul-2021 13:52:31 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072021-DOD.b\072021036.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1184765	1019872			86.1	50 - 150
9 PFDS			964.00	804.94	83.5	70 - 130
25 PFUdA			1000.00	910.51	91.1	70 - 130
5 N-EtFOSAA			1000.00	948.31	94.8	70 - 130
D 60 d5-EtFOSAA	1027799	956949			93.1	50 - 150
D 52 13C7_PFUdA	784621	808603			103.1	50 - 150
D 61 d7-MeFOSE	174430	153747			88.1	50 - 150
32 MeFOSE			1000.00	931.57	93.2	70 - 130
26 MeFOSA			1000.00	1221.18	122.1	70 - 130
D 57 d3-MeFOSA	54795	50371			91.9	50 - 150
31 11Cl-PF3OUDS			942.00	812.78	86.3	70 - 130
D 62 d9-EtFOSE	161103	134174			83.3	50 - 150
33 EtFOSE			1000.00	897.98	89.8	70 - 130
D 59 d5-EtFOSA	57847	48665			84.1	50 - 150
27 EtFOSA			1000.00	1132.51	113.3	70 - 130
11 PFDoA			1000.00	875.84	87.6	70 - 130
D 38 13C2_PFDoA	831616	796719			95.8	50 - 150
4 10:2 FTS			964.00	834.92	86.6	70 - 130
34 PFDOS			968.00	837.41	86.5	70 - 130
24 PFTrDA			1000.00	767.02	76.7	70 - 130
23 PFTeDA			1000.00	892.57	89.3	70 - 130
D 42 13C2_PFTeDA	861889	750041			87	50 - 150
D 40 13C2_PFHxDA	545538	409035			75	50 - 150
35 PFHxDA			1000.00	1026.75	102.7	70 - 130
36 PFODA			1000.00	1094.60	109.5	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072021-DOD.b\072021036.d
Injection Date: 20-Jul-2021 17:16:15 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 27
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.702	1.708	0	990803	22	>100:1			1000.00	1070.47	98.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.714	0/0	909328	23	>100:1			1000.00	905.74		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.078	1	1021012	17	>100:1			1000.00	1077.28	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.078	1/0	926537	17	>100:1			1000.00	909.54		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.131	1	313845	17	>100:1			1000.00	1034.42	101.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.131	1/0	356369	18	>100:1	Target = 3.79		884.00	821.44		
298.9 > 99	44	2.120	2.131		93000	17	>100:1	3.83 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.467	2.485	0/-1	255760	20	>100:1	Target = 3.30		938.00	800.94		
349 > 99	44	2.467	2.485		79827	20	>100:1	3.20 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.389	2.407	1	237448	19	>100:1			5000.00	5185.11	87.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.389	2.407	0/-1	90636	20	>100:1	Target = 1.48		934.00	1086.01		
327 > 81	63	2.389	2.407		59609	29	>100:1	1.52 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.450	1	938299	20	>100:1			1000.00	1122.71	102.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.450	0/-1	763524	20	>100:1	Target = 16.51		1000.00	840.19		
313 > 119	49	2.433	2.450		44943	18	>100:1	16.98 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.545	2.563	0	687812	20	>100:1			5000.00	4158.89	81.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.554	2.571	1/1	220333	21	>100:1	Target = 0.69		2000.00	2295.01		
285 > 185	66	2.554	2.571		267525	18	>100:1	0.82 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.811	2.837	0	957295	20	>100:1			1000.00	1060.47	97.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.811	2.837	0/0	840649	20	>100:1	Target = 3.47		1000.00	958.13		
363 > 169	47	2.811	2.837		236773	21	>100:1	3.55 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.828	2.855	0	277214	22	>100:1			1000.00	1021.08	101.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.828	2.855	0/0	248793	29	>100:1	Target = 3.30	0.15	910.00	807.27		
399 > 99	45	2.828	2.855		74024	34	>100:1	3.36 (1.65-4.95)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.855	2.881	0/0	1266266	21	>100:1	Target = 2.54		942.00	901.67		
377 > 85	45	2.855	2.881		481682	19	>100:1	2.62 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.204	3.242	0/0	220478	26	>100:1	Target = 3.54		952.00	810.45		
449 > 99	45	3.204	3.242		63763	24	>100:1	3.45 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.179	3.210	0	227673	33	>100:1			5000.00	5125.61	95.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.179	3.217	0/0	91895	31	>100:1	Target = 1.46		948.00	1084.34		
427 > 81	64	3.179	3.217		52527	22	>100:1	1.74 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.204	3.236	0	959895	25	>100:1			1000.00	1070.05	96.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.198	3.236	0/0	871154	38	>100:1	Target = 2.72		1000.00	906.71		
413 > 169	53	3.204	3.236		335856	37	>100:1	2.59 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.573	3.610	0	225395	23	>100:1			1000.00	989.77	93.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.573	3.610	0/0	212082	38	>100:1	Target = 3.88	0.25	928.00	839.84		
499 > 99	54	3.573	3.610		52841	35	>100:1	4.01 (1.94-5.83)	0.09				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.826	0/0	571646	24				932.00	883.60		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.947	0/0	173258	22	>100:1	Target = 3.09		960.00	909.06		
549 > 99	54	3.916	3.947		56266	23	>100:1	3.07 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.254	0/0	179815	19	>100:1	Target = 3.32		964.00	804.94		
599 > 99	54	4.208	4.254		55604	22	>100:1	3.23 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.407	0/0	469679	17	>100:1			942.00	812.78		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.713	4.750	0/0	165281	22	>100:1	Target = 3.35		968.00	837.41		
699 > 99	54	4.713	4.750		48608	22	>100:1	3.40 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.580	3.618	0	1009020	22	>100:1			1000.00	1134.50	103.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.580	3.610	0/0	756414	20	>100:1	Target = 4.81		1000.00	883.75		
463 > 169	56	3.580	3.610		150994	22	>100:1	5.00 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.856	3.901	0	403157	23	>100:1			1000.00	894.60	90	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.901	0/0	417946	21	>100:1	Target = 40.56		1000.00	1017.40		
498>478	55	3.848	3.901		12189	30	82:1	34.28 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.916	3.955	0	161338	21				5000.00	4949.54	86.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.916	3.972	0/0	55837	18	>100:1	Target = 1.50		958.00	1070.82		
527 > 81	65	3.916	3.972		34261	25	>100:1	1.62 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.505	4.537	0/0	53334	21	>100:1	Target = 2.24		964.00	834.92		
627 > 80	65	4.505	4.537		22860	25	>100:1	2.33 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.964	0	897731	19	>100:1			1000.00	1183.94	96.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.923	3.964	0/0	700910	21	>100:1	Target = 9.65		1000.00	857.91		
513 > 169	51	3.923	3.964		67368	26	>100:1	10.40 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.126	0	1019872	18	>100:1			5000.00	5100.70	86.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.118	-2/-2	154491	35	>100:1	Target = 1.47	0.08	1000.00	985.72		M
570 > 483	58	4.077	4.118		110433	34		1.39 (0.73-2.21)	0.21				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.273	0	956949	19	>100:1			5000.00	5328.64	93.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.291	-3/-3	181283	36	>100:1	Target = 1.78		1000.00	948.31		M
584 > 526	60	4.235	4.291		97441	33	>100:1	1.86 (0.89-2.67)	0.22				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.273	0	808603	18	>100:1			1000.00	1081.97	103.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.273	0/0	649860	19	>100:1	Target = 9.77		1000.00	910.51		
563 > 169	52	4.235	4.273		67503	24	>100:1	9.62 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.319	1	153747	24	>100:1			1000.00	884.38	88.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.337	1/0	128968	17	>100:1			1000.00	931.57		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.300	4.337	1	50371	15	>100:1			1000.00	809.04	91.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.300	4.347	1/0	65160	16	>100:1	Target = 1.18		1000.00	1221.18		
512 > 219	57	4.300	4.347		54389	14	>100:1	1.19 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.442	4.480	0	134174	20	>100:1			1000.00	846.89	83.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.488	1/1	100800	19	>100:1			1000.00	897.98		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.456	4.497	0	48665	19	>100:1			1000.00	797.21	84.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.472	4.513	0/0	57215	19	>100:1	Target = 1.11		1000.00	1132.51		
526 > 219	59	4.464	4.513		51150	23	>100:1	1.11 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.497	4.537	0	796719	18	>100:1			1000.00	1029.08	95.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.497	4.537	0/0	671476	18	>100:1	Target = 7.48		1000.00	875.84		
613 > 169	38	4.497	4.537		82434	17	>100:1	8.14 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.738	4.773	0/0	259201	21	>100:1	Target = 3.23		1000.00	767.02		
663 > 169	38	4.738	4.773		80916	20	>100:1	3.20 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.956	4.994	0	750041	19	>100:1			1000.00	907.34	87	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.956	4.994	0/0	538304	17	89:1	Target = 8.62		1000.00	892.57		
713 > 169	42	4.956	4.994		54838	16	>100:1	9.81 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.347	5.381	0	409035	19	>100:1			1000.00	801.57	75	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.381	0/0	646237	19	70:1	Target = 12.71		1000.00	1026.75		
813 > 269	40	5.347	5.381		50197	21	>100:1	12.87 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.715	5.766	0/0	541506	32	73:1	Target = 113.87		1000.00	1094.60		
913 > 319	40	5.715	5.766		5279	42	>100:1	102.57 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.923	3.964	0	783836	22							
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.433	2.450	1	831740	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.204	3.229	0	960790	27	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.714	1	922068	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.573	3.610	0	215475	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121005.d
Injection Date: 21-Jul-2021 12:47:32 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	960189	1137636			118.5	50 - 150
8 PFBA			100.00	108.07	108.1	70 - 130
D 50 13C5_PFPeA	979583	1166607			119.1	50 - 150
21 PFPeA			100.00	95.068	95.1	70 - 130
7 PFBS			88.400	85.848	97.1	70 - 130
D 44 13C3_PFBS	316591	325326			102.8	50 - 150
1 4:2 FTS			93.400	106.06	113.6	70 - 130
D 63 13C2_4:2 FTS_2	251776	362671			144	50 - 150
D 49 13C5_PFHxA	862788	1051765			121.9	50 - 150
15 PFHxA			100.00	93.486	93.5	70 - 130
22 PFPeS			93.800	101.45	108.2	70 - 130
28 GenX			200.00	235.90	118	70 - 130
D 66 13C3_GenX	897310	616778			68.7	50 - 150
D 47 13C4_PFHpA	907666	1067513			117.6	50 - 150
13 PFHpA			100.00	83.025	83	70 - 130
D 45 13C3_PFHxS	303002	290956			96	50 - 150
14 PFHxS			91.000	91.242	100.3	70 - 130
29 ADONA			94.200	100.86	107.1	70 - 130
D 64 13C2_6:2 FTS_2	244810	319985			130.7	50 - 150
2 6:2 FTS			94.800	109.24	115.2	70 - 130
20 PFOA			100.00	98.932	98.9	70 - 130
D 53 13C8_PFOA	921507	979649			106.3	50 - 150
12 PFHpS			95.200	95.637	100.5	70 - 130
18 PFOS			92.800	90.948	98	70 - 130
D 54 13C8_PFOS	232494	224981			96.8	50 - 150
17 PFNA			100.00	103.77	103.8	70 - 130
D 56 13C9_PFNA	901596	1022766			113.4	50 - 150
30 9Cl-PF3ONS			93.200	110.46	118.5	70 - 130
D 55 13C8_PFOSA	459073	502649			109.5	50 - 150
19 PFOSA			100.00	83.738	83.7	70 - 130
16 PFNS			96.000	104.47	108.8	70 - 130
D 65 13C2_8:2 FTS_2	168869	233985			138.6	50 - 150
3 8:2 FTS			95.800	120.66	126	70 - 130
10 PFDA			100.00	102.03	102	70 - 130
D 51 13C6_PFDA	831393	778816			93.7	50 - 150
6 N-MeFOSAA			100.00	109.97	110	70 - 130

Report Date: 22-Jul-2021 11:00:29 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	941259	1136210			120.7	50 - 150
9 PFDS			96.400	109.67	113.8	70 - 130
25 PFUdA			100.00	106.21	106.2	70 - 130
5 N-EtFOSAA			100.00	104.00	104	70 - 130
D 60 d5-EtFOSAA	956597	1136822			118.8	50 - 150
D 52 13C7_PFUdA	803090	755318			94.1	50 - 150
D 61 d7-MeFOSE	176335	144143			81.7	50 - 150
32 MeFOSE			100.00	119.30	119.3	70 - 130
26 MeFOSA			100.00	103.64	103.6	70 - 130
D 57 d3-MeFOSA	62206	65937			106	50 - 150
31 11Cl-PF3OUDS			94.200	96.226	102.2	70 - 130
D 62 d9-EtFOSE	156993	139521			88.9	50 - 150
33 EtFOSE			100.00	100.78	100.8	70 - 130
D 59 d5-EtFOSA	64110	58107			90.6	50 - 150
27 EtFOSA			100.00	123.97	124	70 - 130
11 PFDoA			100.00	104.78	104.8	70 - 130
D 38 13C2_PFDoA	788291	692986			87.9	50 - 150
4 10:2 FTS			96.400	70.119	72.7	70 - 130
34 PFDOS			96.800	104.58	108	70 - 130
24 PFTrDA			100.00	79.403	79.4	70 - 130
23 PFTeDA			100.00	95.221	95.2	70 - 130
D 42 13C2_PFTeDA	844286	620886			73.5	50 - 150
D 40 13C2_PFHxDA	524461	382750			73	50 - 150
35 PFHxDA			100.00	114.81	114.8	70 - 130
36 PFODA			100.00	94.054	94.1	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121005.d
Injection Date: 21-Jul-2021 12:47:32 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.706	1	1137636	22	>100:1			1000.00	1229.11	118.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.712	1/0	124572	21	42:1			100.00	108.07		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	0	1166607	17	>100:1			1000.00	1230.90	119.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	0/0	110654	17	>100:1			100.00	95.068		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	0	325326	16	>100:1			1000.00	1072.26	102.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	0/0	38606	25	>100:1	Target = 3.79		88.400	85.848		
298.9 > 99	44	2.118	2.118		12324	19	95:1	3.13 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	0/0	33582	19	>100:1	Target = 3.30		93.800	101.45		
349 > 99	44	2.466	2.466		9708	18	>100:1	3.45 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	0	362671	20	>100:1			5000.00	7919.58	144	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.388	0/0	13520	20	>100:1	Target = 1.48		93.400	106.06		
327 > 81	63	2.396	2.388		9390	10	71:1	1.43 (0.74-2.22)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.431	2.431	0	1051765	20	>100:1			1000.00	1258.47	121.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.431	2.431	0/0	95230	18	>100:1	Target = 16.51		100.00	93.486		
313 > 119	49	2.422	2.431		6802	19	31:1	14.00 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	1	616778	21	>100:1			5000.00	3729.38	68.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	0/-1	20309	19	75:1	Target = 0.69		200.00	235.90		
285 > 185	66	2.553	2.553		28695	21	91:1	0.70 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	1067513	20	>100:1			1000.00	1182.57	117.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/1	81232	19	>100:1	Target = 3.47		100.00	83.025		
363 > 169	47	2.818	2.818		27763	21	86:1	2.92 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.826	2.826	0	290956	20	>100:1			1000.00	1071.70	96	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.835	0/0	29514	28	>100:1	Target = 3.30	0.15	91.000	91.242		
399 > 99	45	2.826	2.835		11174	27	91:1	2.64 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.862	1/1	148668	20	>100:1	Target = 2.54		94.200	100.86		
377 > 85	45	2.853	2.862		60978	18	>100:1	2.43 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.211	3.211	0/0	27307	23	>100:1	Target = 3.54		95.200	95.637		M
449 > 99	45	3.211	3.211		8784	26	56:1	3.10 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.172	3.172	0	319985	31	>100:1			5000.00	7203.83	130.7	M
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.185	3.185	2/2	20007	22	85:1	Target = 1.46		94.800	109.24		M
427 > 81	64	3.172	3.185		16514	28	98:1	1.21 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.204	3.204	1	979649	24	>100:1			1000.00	1092.08	106.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.204	3.204	1/0	97009	21	47:1	Target = 2.72		100.00	98.932		
413 > 169	53	3.198	3.204		34758	21	61:1	2.79 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.582	1	224981	23	>100:1			1000.00	987.95	96.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.582	0/-1	27012	49	85:1	Target = 3.88	0.30	92.800	90.948		
499 > 99	54	3.567	3.582		7766	38	53:1	3.47 (1.94-5.83)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.784	3.784	1/0	71331	22	>100:1			93.200	110.46		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.911	3.911	1/0	19874	25	>100:1	Target = 3.09		96.000	104.47		
549 > 99	54	3.911	3.911		4358	14	31:1	4.56 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.218	4.218	1/0	24454	17	>100:1	Target = 3.32		96.400	109.67		
599 > 99	54	4.210	4.218		6662	22	46:1	3.67 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.375	4.375	1/0	55504	19	>100:1			94.200	96.226		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.715	4.715	1/0	20603	19	>100:1	Target = 3.35		96.800	104.58		
699 > 99	54	4.715	4.715		6191	27	86:1	3.32 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.582	1	1022766	22	>100:1			1000.00	1149.95	113.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.582	3.582	0/-1	90030	22	>100:1	Target = 4.81		100.00	103.77		
463 > 169	56	3.582	3.582		19514	20	>100:1	4.61 (2.40-7.21)					M
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.865	3.865	1	502649	21	>100:1			1000.00	1115.37	109.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.858	3.858	0/-1	42889	21	57:1	Target = 40.56		100.00	83.738		
498>478	55	3.858	3.858		1410	15	9.8:1	30.41 (20.28-60.84)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.918	3.918	1	233985	19	>100:1			5000.00	7178.21	138.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.926	3.926	1/0	9125	17	56:1	Target = 1.50		95.800	120.66		
527 > 81	65	3.911	3.926		5578	23	29:1	1.63 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.515	4.515	1/0	6496	19	72:1	Target = 2.24		96.400	70.119		
627 > 80	65	4.523	4.515		3172	24	35:1	2.04 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.926	3.926	1	778816	20	>100:1			1000.00	1027.11	93.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.926	3.926	1/0	72316	20	>100:1	Target = 9.65		100.00	102.03		
513 > 169	51	3.926	3.926		7756	17	49:1	9.32 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.079	4.079	1	1136210	20	>100:1			5000.00	5682.54	120.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.095	4.095	0/-1	19201	32	99:1	Target = 1.47	0.09	100.00	109.97		M
570 > 483	58	4.079	4.095		12971	35		1.48 (0.73-2.21)	0.21				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.237	4.237	1	1136822	19	>100:1			5000.00	6330.23	118.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.237	4.237	1/0	23618	33	>100:1	Target = 1.78		100.00	104.00		M
584 > 526	60	4.237	4.237		13827	32	31:1	1.70 (0.89-2.67)	0.26				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.227	4.227	1	755318	17	>100:1			1000.00	1010.67	94.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.237	4.237	1/0	70813	19	>100:1	Target = 9.77		100.00	106.21		
563 > 169	52	4.227	4.237		5944	14	23:1	11.91 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.284	4.284	1	144143	18	>100:1			1000.00	829.13	81.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.293	4.293	1/0	15485	18	28:1			100.00	119.30		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.302	4.302	1	65937	16	57:1			1000.00	1059.06	106	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.302	1/0	7239	16	43:1	Target = 1.18		100.00	103.64		
512 > 219	57	4.312	4.302		5988	16	20:1	1.20 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.444	4.444	1	139521	21	>100:1			1000.00	880.64	88.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.457	1/0	11764	17	45:1			100.00	100.78		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.465	1	58107	20	>100:1			1000.00	951.88	90.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.474	4.474	1/0	7478	22	38:1	Target = 1.11		100.00	123.97		
526 > 219	59	4.474	4.474		7362	21	31:1	1.01 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.506	4.506	1	692986	19	>100:1			1000.00	895.09	87.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.498	4.498	1/0	69872	23	39:1	Target = 7.48		100.00	104.78		
613 > 169	38	4.506	4.498		8409	16	85:1	8.30 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.746	4.746	1/0	23339	20	68:1	Target = 3.23		100.00	79.403		
663 > 169	38	4.746	4.746		7209	19	87:1	3.23 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.958	4.958	1	620886	21	>100:1			1000.00	751.10	73.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.958	4.958	1/0	47538	17	14:1	Target = 8.62		100.00	95.221		
713 > 169	42	4.958	4.958		6661	22	70:1	7.13 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.351	5.351	1	382750	19	>100:1			1000.00	750.06	73	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.351	5.351	1/0	67618	19	>100:1	Target = 12.71		100.00	114.81		
813 > 269	40	5.351	5.351		4303	16	76:1	15.71 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.733	5.733	0/-1	43539	25	>100:1	Target = 113.87		100.00	94.054		
913 > 319	40	5.726	5.733		439	28	41:1	99.17 (56.93-170.81)					M
*** 37 13C2_PFDA**													
515 > 470		3.926	3.926	1	764359	21	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.431	2.431	0	917509	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.204	3.204	1	1002619	25	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.706	0	1081283	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.574	3.574	1	273592	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121006.d
Injection Date: 21-Jul-2021 12:58:04 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1137636	1159841			102	50 - 150
8 PFBA			200.00	210.07	105	70 - 130
D 50 13C5_PFPeA	1166607	1175645			100.8	50 - 150
21 PFPeA			200.00	204.55	102.3	70 - 130
7 PFBS			176.80	174.03	98.4	70 - 130
D 44 13C3_PFBS	325326	340068			104.5	50 - 150
1 4:2 FTS			186.80	156.02	83.5	70 - 130
D 63 13C2_4:2 FTS_2	362671	425317			117.3	50 - 150
D 49 13C5_PFHxA	1051765	1058790			100.7	50 - 150
15 PFHxA			200.00	193.79	96.9	70 - 130
22 PFPeS			187.60	198.96	106.1	70 - 130
28 GenX			400.00	507.28	126.8	70 - 130
D 66 13C3_GenX	616778	692842			112.3	50 - 150
D 47 13C4_PFHpA	1067513	1129218			105.8	50 - 150
13 PFHpA			200.00	179.71	89.9	70 - 130
D 45 13C3_PFHxS	290956	309810			106.5	50 - 150
14 PFHxS			182.00	170.93	93.9	70 - 130
29 ADONA			188.40	196.90	104.5	70 - 130
D 64 13C2_6:2 FTS_2	319985	328061			102.5	50 - 150
2 6:2 FTS			189.60	222.63	117.4	70 - 130
20 PFOA			200.00	189.31	94.7	70 - 130
D 53 13C8_PFOA	979649	1031674			105.3	50 - 150
12 PFHpS			190.40	177.06	93	70 - 130
18 PFOS			185.60	169.51	91.3	70 - 130
D 54 13C8_PFOS	224981	260952			116	50 - 150
17 PFNA			200.00	203.93	102	70 - 130
D 56 13C9_PFNA	1022766	1002289			98	50 - 150
30 9Cl-PF3ONS			186.40	184.18	98.8	70 - 130
D 55 13C8_PFOSA	502649	509260			101.3	50 - 150
19 PFOSA			200.00	193.69	96.8	70 - 130
16 PFNS			192.00	208.01	108.3	70 - 130
D 65 13C2_8:2 FTS_2	233985	230735			98.6	50 - 150
3 8:2 FTS			191.60	205.65	107.3	70 - 130
10 PFDA			200.00	205.35	102.7	70 - 130
D 51 13C6_PFDA	778816	892746			114.6	50 - 150
6 N-MeFOSAA			200.00	218.41	109.2	70 - 130

Report Date: 22-Jul-2021 11:00:30 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1136210	1197877			105.4	50 - 150
9 PFDS			192.80	171.95	89.2	70 - 130
25 PFUdA			200.00	201.08	100.5	70 - 130
5 N-EtFOSAA			200.00	203.67	101.8	70 - 130
D 60 d5-EtFOSAA	1136822	1099414			96.7	50 - 150
D 52 13C7_PFUdA	755318	819955			108.6	50 - 150
D 61 d7-MeFOSE	144143	158779			110.2	50 - 150
32 MeFOSE			200.00	208.13	104.1	70 - 130
26 MeFOSA			200.00	232.52	116.3	70 - 130
D 57 d3-MeFOSA	65937	63578			96.4	50 - 150
31 11Cl-PF3OUDS			188.40	190.59	101.2	70 - 130
D 62 d9-EtFOSE	139521	147402			105.6	50 - 150
33 EtFOSE			200.00	196.01	98	70 - 130
D 59 d5-EtFOSA	58107	62485			107.5	50 - 150
27 EtFOSA			200.00	202.09	101	70 - 130
11 PFDoA			200.00	189.83	94.9	70 - 130
D 38 13C2_PFDoA	692986	728676			105.2	50 - 150
4 10:2 FTS			192.80	198.30	102.9	70 - 130
34 PFDOS			193.60	168.67	87.1	70 - 130
24 PFTrDA			200.00	174.04	87	70 - 130
23 PFTeDA			200.00	190.45	95.2	70 - 130
D 42 13C2_PFTeDA	620886	704996			113.5	50 - 150
D 40 13C2_PFHxDA	382750	391896			102.4	50 - 150
35 PFHxDA			200.00	214.10	107	70 - 130
36 PFODA			200.00	187.24	93.6	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121006.d
Injection Date: 21-Jul-2021 12:58:04 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.706	1	1159841	22	>100:1			1000.00	1253.10	102	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.712	0/-1	246882	21	83:1			200.00	210.07		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	1	1175645	18	>100:1			1000.00	1240.44	100.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	1/0	239929	15	>100:1			200.00	204.55		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	1	340068	16	>100:1			1000.00	1120.85	104.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	1/0	81810	17	>100:1	Target = 3.79		176.80	174.03		
298.9 > 99	44	2.118	2.118		22783	15	>100:1	3.59 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	1/0	68843	21	>100:1	Target = 3.30		187.60	198.96		
349 > 99	44	2.466	2.466		21067	18	>100:1	3.26 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	1	425317	20	>100:1			5000.00	9287.57	117.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.388	1/0	23324	18	>100:1	Target = 1.48		186.80	156.02		
327 > 81	63	2.388	2.388		13536	11	>100:1	1.72 (0.74-2.22)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.431	1	1058790	19	>100:1			1000.00	1266.88	100.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.432	2.431	1/0	198720	18	>100:1	Target = 16.51		200.00	193.79		
313 > 119	49	2.432	2.431		12136	17	44:1	16.37 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	1	692842	22	>100:1			5000.00	4189.31	112.3	M
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	1/0	49058	21	>100:1	Target = 0.69		400.00	507.28		
285 > 185	66	2.553	2.553		57423	20	>100:1	0.85 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.809	1	1129218	20	>100:1			1000.00	1250.92	105.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	185994	21	>100:1	Target = 3.47		200.00	179.71		
363 > 169	47	2.818	2.818		58027	18	>100:1	3.20 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.826	1	309810	20	>100:1			1000.00	1141.14	106.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.835	0/-1	58875	30	>100:1	Target = 3.30	0.19	182.00	170.93		
399 > 99	45	2.827	2.835		19455	30	>100:1	3.02 (1.65-4.95)	0.09				M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.862	1/0	309032	18	>100:1	Target = 2.54		188.40	196.90		
377 > 85	45	2.853	2.862		119219	20	>100:1	2.59 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.211	0/-1	53832	28	>100:1	Target = 3.54		190.40	177.06		
449 > 99	45	3.208	3.211		15443	23	84:1	3.48 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.177	3.172	1	328061	26	>100:1			5000.00	7385.65	102.5	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													a
427 > 407	64	3.183	3.185	2/1	33524	25	>100:1	Target = 1.46		189.60	222.63		
427 > 81	64	3.183	3.185		23809	26	>100:1	1.40 (0.73-2.19)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.204	0	1031674	25	>100:1			1000.00	1150.07	105.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.204	0/0	195492	22	>100:1	Target = 2.72		200.00	189.31		
413 > 169	53	3.202	3.204		75721	25	>100:1	2.58 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.579	3.582	0	260952	24	>100:1			1000.00	1145.91	116	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.579	3.582	0/0	53803	40	>100:1	Target = 3.88	0.22	185.60	169.51		
499 > 99	54	3.572	3.582		15625	42	>100:1	3.44 (1.94-5.83)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.782	3.784	0/0	137955	22	>100:1			186.40	184.18		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.916	3.911	1/1	45898	20	>100:1	Target = 3.09		192.00	208.01		
549 > 99	54	3.923	3.911		14624	25	55:1	3.13 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.217	4.218	0/0	44472	17		Target = 3.32		192.80	171.95		
599 > 99	54	4.217	4.218		14437	18	45:1	3.08 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.374	4.375	0/0	127512	21	>100:1			188.40	190.59		M
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.714	4.715	0/0	38542	21	>100:1	Target = 3.35		193.60	168.67		
699 > 99	54	4.721	4.715		13226	21	>100:1	2.91 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.587	3.582	1	1002289	23	>100:1			1000.00	1126.93	98	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.587	3.582	1/0	173384	21	>100:1	Target = 4.81		200.00	203.93		
463 > 169	56	3.579	3.582		35657	22	>100:1	4.86 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.865	0	509260	22	>100:1			1000.00	1130.04	101.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.858	1/1	100510	20	>100:1	Target = 40.56		200.00	193.69		
498>478	55	3.855	3.858		2423	24	25:1	41.48 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.916	3.918	0	230735	20				5000.00	7078.51	98.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.916	3.926	0/0	15336	23	82:1	Target = 1.50		191.60	205.65		
527 > 81	65	3.916	3.926		10762	27		1.42 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.514	4.515	0/0	18116	24		Target = 2.24		192.80	198.30		
627 > 80	65	4.506	4.515		5589	18	55:1	3.24 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.923	3.926	0	892746	20	>100:1			1000.00	1177.36	114.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.923	3.926	0/0	166842	21	>100:1	Target = 9.65		200.00	205.35		
513 > 169	51	3.931	3.926		16352	24	71:1	10.20 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.079	0	1197877	19	>100:1			5000.00	5990.95	105.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.085	4.095	0/0	40206	40	>100:1	Target = 1.47	0.10	200.00	218.41		M
570 > 483	58	4.085	4.095		24413	32	>100:1	1.64 (0.73-2.21)	0.22				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.235	4.237	0	1099414	17	>100:1			5000.00	6121.93	96.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.245	4.237	1/1	44730	34	>100:1	Target = 1.78	0.12	200.00	203.67		M
584 > 526	60	4.235	4.237		24905	37	58:1	1.79 (0.89-2.67)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.235	4.227	1	819955	19	>100:1			1000.00	1097.16	108.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.235	4.237	0/-1	145533	19	>100:1	Target = 9.77		200.00	201.08		
563 > 169	52	4.235	4.237		14643	19	49:1	9.93 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.284	0	158779	16	>100:1			1000.00	913.32	110.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.293	0/0	29757	14	60:1			200.00	208.13		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.302	0	63578	16	4.4:1			1000.00	1021.17	96.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.310	4.302	1/1	15660	12	75:1	Target = 1.18		200.00	232.52		M
512 > 219	57	4.310	4.302		13635	13	73:1	1.14 (0.59-1.78)					M
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.444	0	147402	28	>100:1			1000.00	930.38	105.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.457	0/0	24172	14	79:1			200.00	196.01		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.465	0	62485	20	>100:1			1000.00	1023.60	107.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.474	0/0	13109	17	>100:1	Target = 1.11		200.00	202.09		
526 > 219	59	4.473	4.474		13198	18	65:1	0.99 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.506	4.506	0	728676	19	>100:1			1000.00	941.19	105.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.506	4.498	1/1	133104	17	76:1	Target = 7.48		200.00	189.83		
613 > 169	38	4.506	4.498		19103	17	>100:1	6.96 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.739	4.746	0/0	53792	21	>100:1	Target = 3.23		200.00	174.04		
663 > 169	38	4.739	4.746		17477	32	>100:1	3.07 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.958	4.958	0	704996	20	>100:1			1000.00	852.85	113.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.966	4.958	1/1	107961	17	14:1	Target = 8.62		200.00	190.45		
713 > 169	42	4.966	4.958		12358	29	>100:1	8.73 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.348	5.351	0	391896	18	>100:1			1000.00	767.98	102.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.348	5.351	0/0	129108	19	11:1	Target = 12.71		200.00	214.10		
813 > 269	40	5.348	5.351		8379	17	>100:1	15.40 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.723	5.733	0/0	88748	22	9.5:1	Target = 113.87		200.00	187.24		
913 > 319	40	5.730	5.733		828	21	72:1	107.18 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.923	3.926	0	832794	21	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.432	2.431	1	999896	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.204	0	1068637	26	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.706	1	1173775	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.579	3.574	1	265902	30	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121015.d
Injection Date: 21-Jul-2021 14:33:14 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 8
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1137636	1198989			105.4	50 - 150
8 PFBA			1000.00	900.28	90	70 - 130
D 50 13C5_PFPeA	1166607	1149426			98.5	50 - 150
21 PFPeA			1000.00	912.96	91.3	70 - 130
7 PFBS			884.00	778.90	88.1	70 - 130
D 44 13C3_PFBS	325326	321861			98.9	50 - 150
1 4:2 FTS			934.00	1052.88	112.7	70 - 130
D 63 13C2_4:2 FTS_2	362671	329672			90.9	50 - 150
D 49 13C5_PFHxA	1051765	988045			93.9	50 - 150
15 PFHxA			1000.00	964.09	96.4	70 - 130
22 PFPeS			938.00	862.53	92	70 - 130
28 GenX			2000.00	2473.03	123.7	70 - 130
D 66 13C3_GenX	616778	563395			91.3	50 - 150
D 47 13C4_PFHpA	1067513	1034986			97	50 - 150
13 PFHpA			1000.00	900.07	90	70 - 130
D 45 13C3_PFHxS	290956	286838			98.6	50 - 150
14 PFHxS			910.00	863.09	94.8	70 - 130
29 ADONA			942.00	987.06	104.8	70 - 130
D 64 13C2_6:2 FTS_2	319985	281138			87.9	50 - 150
2 6:2 FTS			948.00	975.71	102.9	70 - 130
20 PFOA			1000.00	883.88	88.4	70 - 130
D 53 13C8_PFOA	979649	1009659			103.1	50 - 150
12 PFHpS			952.00	853.23	89.6	70 - 130
18 PFOS			928.00	785.75	84.7	70 - 130
D 54 13C8_PFOS	224981	272695			121.2	50 - 150
17 PFNA			1000.00	938.65	93.9	70 - 130
D 56 13C9_PFNA	1022766	1013634			99.1	50 - 150
30 9Cl-PF3ONS			932.00	757.25	81.3	70 - 130
D 55 13C8_PFOSA	502649	419658			83.5	50 - 150
19 PFOSA			1000.00	984.38	98.4	70 - 130
16 PFNS			960.00	852.94	88.8	70 - 130
D 65 13C2_8:2 FTS_2	233985	204506			87.4	50 - 150
3 8:2 FTS			958.00	1044.98	109.1	70 - 130
10 PFDA			1000.00	839.56	84	70 - 130
D 51 13C6_PFDA	778816	888853			114.1	50 - 150
6 N-MeFOSAA			1000.00	993.37	99.3	70 - 130

Report Date: 22-Jul-2021 11:00:33 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121015.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1136210	1071077			94.3	50 - 150
9 PFDS			964.00	763.54	79.2	70 - 130
25 PFUdA			1000.00	893.45	89.3	70 - 130
5 N-EtFOSAA			1000.00	916.55	91.7	70 - 130
D 60 d5-EtFOSAA	1136822	1060298			93.3	50 - 150
D 52 13C7_PFUdA	755318	766361			101.5	50 - 150
D 61 d7-MeFOSE	144143	131969			91.6	50 - 150
32 MeFOSE			1000.00	1096.83	109.7	70 - 130
26 MeFOSA			1000.00	1061.26	106.1	70 - 130
D 57 d3-MeFOSA	65937	56588			85.8	50 - 150
31 11Cl-PF3OUDS			942.00	757.07	80.4	70 - 130
D 62 d9-EtFOSE	139521	132073			94.7	50 - 150
33 EtFOSE			1000.00	970.15	97	70 - 130
D 59 d5-EtFOSA	58107	53350			91.8	50 - 150
27 EtFOSA			1000.00	1151.63	115.2	70 - 130
11 PFDoA			1000.00	878.76	87.9	70 - 130
D 38 13C2_PFDoA	692986	721445			104.1	50 - 150
4 10:2 FTS			964.00	838.52	87	70 - 130
34 PFDOS			968.00	767.76	79.3	70 - 130
24 PFTrDA			1000.00	764.48	76.4	70 - 130
23 PFTeDA			1000.00	851.94	85.2	70 - 130
D 42 13C2_PFTeDA	620886	660111			106.3	50 - 150
D 40 13C2_PFHxDA	382750	340223			88.9	50 - 150
35 PFHxDA			1000.00	1039.46	103.9	70 - 130
36 PFODA			1000.00	1057.99	105.8	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121015.d
Injection Date: 21-Jul-2021 14:33:14 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 8
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.702	1.706	0	1198989	23	>100:1			1000.00	1295.40	105.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.712	0/0	1093757	22	>100:1			1000.00	900.28		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.066	0	1149426	18	>100:1			1000.00	1212.78	98.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.066	0/0	1046993	18	>100:1			1000.00	912.96		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.118	0	321861	17	>100:1			1000.00	1060.84	98.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.118	0/0	346542	17	>100:1	Target = 3.79		884.00	778.90		
298.9 > 99	44	2.120	2.118		98625	18	>100:1	3.51 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.460	2.466	0/0	282462	20	>100:1	Target = 3.30		938.00	862.53		
349 > 99	44	2.460	2.466		92167	20	>100:1	3.06 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.390	2.388	0	329672	20	>100:1			5000.00	7198.99	90.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.390	2.388	0/0	122000	21		Target = 1.48		934.00	1052.88		
327 > 81	63	2.390	2.388		73690	20	>100:1	1.65 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.425	2.431	0	988045	20	>100:1			1000.00	1182.23	93.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.425	2.431	0/0	922569	20	>100:1	Target = 16.51		1000.00	964.09		
313 > 119	49	2.425	2.431		47262	19	>100:1	19.52 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.547	2.553	0	563395	19	>100:1			5000.00	3406.60	91.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.547	2.553	0/0	194477	19	>100:1	Target = 0.69		2000.00	2473.03		
285 > 185	66	2.547	2.553		247005	20	>100:1	0.78 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.814	2.809	0	1034986	20	>100:1			1000.00	1146.53	97	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.805	2.818	0/0	853793	21	>100:1	Target = 3.47		1000.00	900.07		
363 > 169	47	2.814	2.818		262274	19	>100:1	3.25 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.832	2.826	0	286838	20	>100:1			1000.00	1056.53	98.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.832	2.835	0/0	275231	29	>100:1	Target = 3.30	0.15	910.00	863.09		
399 > 99	45	2.832	2.835		79784	28	>100:1	3.44 (1.65-4.95)	0.08				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.849	2.862	0/0	1434304	20	>100:1	Target = 2.54		942.00	987.06		
377 > 85	45	2.849	2.862		535919	19	>100:1	2.67 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.211	0/0	240174	25	>100:1	Target = 3.54		952.00	853.23		
449 > 99	45	3.202	3.211		68757	25	>100:1	3.49 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.183	3.172	0	281138	25	>100:1			5000.00	6329.27	87.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.177	3.185	0/0	102792	36	>100:1	Target = 1.46		948.00	975.71		
427 > 81	64	3.177	3.185		64301	24	>100:1	1.59 (0.73-2.19)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.204	0	1009659	25	>100:1			1000.00	1125.53	103.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.204	0/0	893242	26	>100:1	Target = 2.72		1000.00	883.88		
413 > 169	53	3.202	3.204		327124	24	>100:1	2.73 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.572	3.582	0	272695	22	>100:1			1000.00	1197.47	121.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.579	3.582	0/0	240420	49	>100:1	Target = 3.88	0.26	928.00	785.75		M
499 > 99	54	3.572	3.582		57480	37	>100:1	4.18 (1.94-5.83)	0.12				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.782	3.784	0/0	592714	24	>100:1			932.00	757.25		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.911	0/0	196676	23	>100:1	Target = 3.09		960.00	852.94		
549 > 99	54	3.915	3.911		52212	22		3.76 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.218	0/0	206360	20	>100:1	Target = 3.32		964.00	763.54		
599 > 99	54	4.208	4.218		64199	25	>100:1	3.21 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.375	0/0	529297	18	>100:1			942.00	757.07		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.714	4.715	0/0	183335	20	>100:1	Target = 3.35		968.00	767.76		
699 > 99	54	4.707	4.715		51169	20	>100:1	3.58 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.579	3.582	0	1013634	22	>100:1			1000.00	1139.68	99.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.579	3.582	0/0	807078	23	>100:1	Target = 4.81		1000.00	938.65		
463 > 169	56	3.579	3.582		152873	21	>100:1	5.27 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.865	0	419658	20	>100:1			1000.00	931.21	83.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.858	0/0	420934	20	>100:1	Target = 40.56		1000.00	984.38		
498>478	55	3.870	3.858		11665	28	83:1	36.08 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.915	3.918	0	204506	20	>100:1			5000.00	6273.85	87.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.915	3.926	0/0	69069	20	>100:1	Target = 1.50		958.00	1044.98		
527 > 81	65	3.915	3.926		44097	18		1.56 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.505	4.515	0/0	67896	18	>100:1	Target = 2.24		964.00	838.52		
627 > 80	65	4.513	4.515		26686	17	>100:1	2.54 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.931	3.926	0	888853	19	>100:1			1000.00	1172.23	114.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.931	3.926	1/1	679138	22	>100:1	Target = 9.65		1000.00	839.56		M
513 > 169	51	3.915	3.926		69658	20	>100:1	9.74 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.079	0	1071077	19	>100:1			5000.00	5356.79	94.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.095	-1/-1	163506	37		Target = 1.47	0.10	1000.00	993.37		M
570 > 483	58	4.077	4.095		121734	37	>100:1	1.34 (0.73-2.21)	0.19				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.235	4.237	0	1060298	19	>100:1			5000.00	5904.12	93.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.237	0/0	194134	39	>100:1	Target = 1.78		1000.00	916.55		M
584 > 526	60	4.235	4.237		108003	34	>100:1	1.79 (0.89-2.67)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.227	0	766361	20	>100:1			1000.00	1025.45	101.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.237	0/0	604371	18	>100:1	Target = 9.77		1000.00	893.45		
563 > 169	52	4.235	4.237		60957	17	>100:1	9.91 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.284	0	131969	15	>100:1			1000.00	759.11	91.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.301	4.293	0/0	130338	17	>100:1			1000.00	1096.83		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.302	0	56588	16	>100:1			1000.00	908.90	85.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.310	4.302	0/0	63616	16	>100:1	Target = 1.18		1000.00	1061.26		
512 > 219	57	4.310	4.302		55177	15	>100:1	1.15 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.449	4.444	0	132073	21	>100:1			1000.00	833.63	94.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.457	0/0	107196	26	>100:1			1000.00	970.15		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.465	0	53350	19	>100:1			1000.00	873.95	91.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.474	0/0	63782	22	>100:1	Target = 1.11		1000.00	1151.63		
526 > 219	59	4.473	4.474		52799	19	>100:1	1.20 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.497	4.506	0	721445	18	>100:1			1000.00	931.85	104.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.505	4.498	0/0	610057	21	>100:1	Target = 7.48		1000.00	878.76		
613 > 169	38	4.497	4.498		76883	19	>100:1	7.93 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.738	4.746	0/0	233933	21	>100:1	Target = 3.23		1000.00	764.48		
663 > 169	38	4.732	4.746		74369	24	>100:1	3.14 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.957	4.958	0	660111	19	>100:1			1000.00	798.55	106.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.957	4.958	0/0	452191	18	64:1	Target = 8.62		1000.00	851.94		
713 > 169	42	4.957	4.958		48339	19	>100:1	9.35 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.339	5.351	0	340223	20	>100:1			1000.00	666.72	88.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.348	5.351	0/0	544173	19	56:1	Target = 12.71		1000.00	1039.46		
813 > 269	40	5.348	5.351		38892	20	>100:1	13.99 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.715	5.733	0/0	435344	36	51:1	Target = 113.87		1000.00	1057.99		
913 > 319	40	5.715	5.733		4672	36	>100:1	93.18 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.923	3.926	0	773633	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.434	2.431	0	933752	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.204	0	955355	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.706	0	1068387	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.572	3.574	0	238709	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121028.d
Injection Date: 21-Jul-2021 16:50:59 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 20
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1137636	1178762			103.6	50 - 150
8 PFBA			1000.00	925.37	92.5	70 - 130
D 50 13C5_PFPeA	1166607	1136051			97.4	50 - 150
21 PFPeA			1000.00	890.45	89	70 - 130
7 PFBS			884.00	688.52	77.9	70 - 130
D 44 13C3_PFBS	325326	363253			111.7	50 - 150
1 4:2 FTS			934.00	964.60	103.3	70 - 130
D 63 13C2_4:2 FTS_2	362671	322430			88.9	50 - 150
D 49 13C5_PFHxA	1051765	967527			92	50 - 150
15 PFHxA			1000.00	934.28	93.4	70 - 130
22 PFPeS			938.00	781.78	83.3	70 - 130
28 GenX			2000.00	2591.12	129.6	70 - 130
D 66 13C3_GenX	616778	597139			96.8	50 - 150
D 47 13C4_PFHpA	1067513	1002914			93.9	50 - 150
13 PFHpA			1000.00	916.81	91.7	70 - 130
D 45 13C3_PFHxS	290956	284097			97.6	50 - 150
14 PFHxS			910.00	855.44	94	70 - 130
29 ADONA			942.00	1029.72	109.3	70 - 130
D 64 13C2_6:2 FTS_2	319985	287454			89.8	50 - 150
2 6:2 FTS			948.00	1030.83	108.7	70 - 130
20 PFOA			1000.00	967.91	96.8	70 - 130
D 53 13C8_PFOA	979649	1000847			102.2	50 - 150
12 PFHpS			952.00	891.79	93.7	70 - 130
18 PFOS			928.00	850.09	91.6	70 - 130
D 54 13C8_PFOS	224981	251538			111.8	50 - 150
17 PFNA			1000.00	921.17	92.1	70 - 130
D 56 13C9_PFNA	1022766	1004858			98.2	50 - 150
30 9Cl-PF3ONS			932.00	814.58	87.4	70 - 130
D 55 13C8_PFOSA	502649	399144			79.4	50 - 150
19 PFOSA			1000.00	1050.29	105	70 - 130
16 PFNS			960.00	887.07	92.4	70 - 130
D 65 13C2_8:2 FTS_2	233985	224050			95.8	50 - 150
3 8:2 FTS			958.00	848.53	88.6	70 - 130
10 PFDA			1000.00	900.64	90.1	70 - 130
D 51 13C6_PFDA	778816	847811			108.9	50 - 150
6 N-MeFOSAA			1000.00	1013.09	101.3	70 - 130

Report Date: 22-Jul-2021 11:00:49 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121028.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1136210	1082327			95.3	50 - 150
9 PFDS			964.00	769.60	79.8	70 - 130
25 PFUdA			1000.00	878.73	87.9	70 - 130
5 N-EtFOSAA			1000.00	938.89	93.9	70 - 130
D 60 d5-EtFOSAA	1136822	1044997			91.9	50 - 150
D 52 13C7_PFUdA	755318	732977			97	50 - 150
D 61 d7-MeFOSE	144143	135655			94.1	50 - 150
32 MeFOSE			1000.00	1047.60	104.8	70 - 130
26 MeFOSA			1000.00	1113.00	111.3	70 - 130
D 57 d3-MeFOSA	65937	59962			90.9	50 - 150
31 11Cl-PF3OUDS			942.00	800.23	85	70 - 130
D 62 d9-EtFOSE	139521	128703			92.2	50 - 150
33 EtFOSE			1000.00	1035.36	103.5	70 - 130
D 59 d5-EtFOSA	58107	53854			92.7	50 - 150
27 EtFOSA			1000.00	1099.03	109.9	70 - 130
11 PFDoA			1000.00	806.06	80.6	70 - 130
D 38 13C2_PFDoA	692986	775727			111.9	50 - 150
4 10:2 FTS			964.00	769.34	79.8	70 - 130
34 PFDOS			968.00	805.09	83.2	70 - 130
24 PFTrDA			1000.00	734.09	73.4	70 - 130
23 PFTeDA			1000.00	941.31	94.1	70 - 130
D 42 13C2_PFTeDA	620886	653575			105.3	50 - 150
D 40 13C2_PFHxDA	382750	347541			90.8	50 - 150
35 PFHxDA			1000.00	1051.54	105.2	70 - 130
36 PFODA			1000.00	959.90	96	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121028.d
Injection Date: 21-Jul-2021 16:50:59 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 20
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.706	1	1178762	22	>100:1			1000.00	1273.55	103.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.712	0/-1	1105281	23	>100:1			1000.00	925.37		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.065	2.066	0	1136051	20	>100:1			1000.00	1198.66	97.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.065	2.066	0/0	1009286	17	>100:1			1000.00	890.45		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	0	363253	17	>100:1			1000.00	1197.27	111.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	0/0	345724	19	>100:1	Target = 3.79		884.00	688.52		
298.9 > 99	44	2.118	2.118		93930	16	>100:1	3.68 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	1/1	288943	20	>100:1	Target = 3.30		938.00	781.78		
349 > 99	44	2.466	2.466		89045	19	>100:1	3.24 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.387	2.388	0	322430	18	>100:1			5000.00	7040.85	88.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.387	2.388	0/0	109316	20	>100:1	Target = 1.48		934.00	964.60		
327 > 81	63	2.396	2.388		69606	20	>100:1	1.57 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.431	2.431	1	967527	20	>100:1			1000.00	1157.68	92	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.431	2.431	1/0	875478	20	>100:1	Target = 16.51		1000.00	934.28		
313 > 119	49	2.431	2.431		53408	19	>100:1	16.39 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.552	2.553	0	597139	25	>100:1			5000.00	3610.63	96.8	M
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.544	2.553	0/-1	215968	21	>100:1	Target = 0.69		2000.00	2591.12		
285 > 185	66	2.544	2.553		243394	20	>100:1	0.88 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.810	2.809	0	1002914	20	>100:1			1000.00	1111.00	93.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.810	2.818	1/1	842727	20	>100:1	Target = 3.47		1000.00	916.81		
363 > 169	47	2.810	2.818		246877	20	>100:1	3.41 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.826	1	284097	21	>100:1			1000.00	1046.43	97.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.835	0/-1	270186	29	>100:1	Target = 3.30	0.18	910.00	855.44		
399 > 99	45	2.827	2.835		82348	30	>100:1	3.28 (1.65-4.95)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.854	2.862	1/0	1481990	21	>100:1	Target = 2.54		942.00	1029.72		
377 > 85	45	2.854	2.862		536338	20	>100:1	2.76 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.209	3.211	1/0	248628	26	>100:1	Target = 3.54		952.00	891.79		
449 > 99	45	3.209	3.211		69017	23	>100:1	3.60 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.177	3.172	0	287454	28	>100:1			5000.00	6471.46	89.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.183	3.185	1/1	110644	27	>100:1	Target = 1.46		948.00	1030.83		
427 > 81	64	3.177	3.185		71930	35	>100:1	1.53 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.204	1	1000847	26	>100:1			1000.00	1115.71	102.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.209	3.204	1/0	969630	26	>100:1	Target = 2.72		1000.00	967.91		
413 > 169	53	3.209	3.204		341191	25	>100:1	2.84 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.580	3.582	1	251538	24	>100:1			1000.00	1104.57	111.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.580	3.582	1/0	239507	47	>100:1	Target = 3.88	0.24	928.00	850.09		M
499 > 99	54	3.587	3.582		62541	40	>100:1	3.82 (1.94-5.83)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.790	3.784	1/0	588117	21	>100:1			932.00	814.58		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.916	3.911	1/0	188677	19	>100:1	Target = 3.09		960.00	887.07		
549 > 99	54	3.923	3.911		58783	19	>100:1	3.20 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.217	4.218	1/0	191862	17	>100:1	Target = 3.32		964.00	769.60		
599 > 99	54	4.217	4.218		58783	18		3.26 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.374	4.375	1/0	516066	18	>100:1			942.00	800.23		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.714	4.715	1/0	177333	21	>100:1	Target = 3.35		968.00	805.09		
699 > 99	54	4.720	4.715		52447	22	>100:1	3.38 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.587	3.582	1	1004858	22	>100:1			1000.00	1129.82	98.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.587	3.582	1/0	785194	22	>100:1	Target = 4.81		1000.00	921.17		
463 > 169	56	3.587	3.582		152593	21	>100:1	5.14 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.865	1	399144	22	>100:1			1000.00	885.69	79.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.871	3.858	1/0	427166	22	>100:1	Target = 40.56		1000.00	1050.29		
498>478	55	3.863	3.858		9265	22		46.10 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.916	3.918	1	224050	21	>100:1			5000.00	6873.42	95.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.916	3.926	1/0	61444	15	>100:1	Target = 1.50		958.00	848.53		
527 > 81	65	3.923	3.926		37861	19	>100:1	1.62 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.514	4.515	1/0	68247	24	>100:1	Target = 2.24		964.00	769.34		
627 > 80	65	4.514	4.515		26762	16	>100:1	2.55 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.931	3.926	1	847811	22	>100:1			1000.00	1118.10	108.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.931	3.926	1/0	694902	21	>100:1	Target = 9.65		1000.00	900.64		
513 > 169	51	3.931	3.926		69079	23	>100:1	10.05 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.079	1	1082327	19	>100:1			5000.00	5413.05	95.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.086	4.095	0/-1	168504	36	>100:1	Target = 1.47		1000.00	1013.09		M
570 > 483	58	4.086	4.095		109954	32	>100:1	1.53 (0.73-2.21)	0.20				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.236	4.237	1	1044997	18	>100:1			5000.00	5818.92	91.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.245	4.237	1/0	195997	37	>100:1	Target = 1.78	0.06	1000.00	938.89		M
584 > 526	60	4.245	4.237		104729	35	>100:1	1.87 (0.89-2.67)	0.20				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.236	4.227	1	732977	18	>100:1			1000.00	980.78	97	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.236	4.237	1/0	568522	19	>100:1	Target = 9.77		1000.00	878.73		
563 > 169	52	4.236	4.237		64586	23		8.80 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.284	1	135655	16	>100:1			1000.00	780.31	94.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.301	4.293	1/0	127965	21	>100:1			1000.00	1047.60		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.311	4.302	1	59962	15	>100:1			1000.00	963.09	90.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.311	4.302	1/0	70696	17	90:1	Target = 1.18		1000.00	1113.00		
512 > 219	57	4.311	4.302		58799	16	>100:1	1.20 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.456	4.444	1	128703	21	>100:1			1000.00	812.36	92.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.464	4.457	1/0	111483	21	>100:1			1000.00	1035.36		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.473	4.465	1	53854	20	>100:1			1000.00	882.21	92.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.481	4.474	1/0	61444	24	>100:1	Target = 1.11		1000.00	1099.03		
526 > 219	59	4.481	4.474		56080	18	>100:1	1.09 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.505	4.506	1	775727	19	>100:1			1000.00	1001.96	111.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.505	4.498	1/0	601693	19	>100:1	Target = 7.48		1000.00	806.06		
613 > 169	38	4.505	4.498		77739	17	>100:1	7.73 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.739	4.746	1/0	241535	25	>100:1	Target = 3.23		1000.00	734.09		
663 > 169	38	4.739	4.746		70558	25	>100:1	3.42 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.957	4.958	1	653575	19	>100:1			1000.00	790.65	105.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.957	4.958	1/0	494684	18	71:1	Target = 8.62		1000.00	941.31		
713 > 169	42	4.957	4.958		53208	17	>100:1	9.29 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.340	5.351	1	347541	19	>100:1			1000.00	681.06	90.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.348	5.351	1/0	562341	18	63:1	Target = 12.71		1000.00	1051.54		
813 > 269	40	5.348	5.351		41769	22	>100:1	13.46 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.723	5.733	1/0	403477	26	52:1	Target = 113.87		1000.00	959.90		
913 > 319	40	5.723	5.733		3888	21	>100:1	103.77 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.931	3.926	1	780132	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.431	2.431	0	855556	21	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.209	3.204	1	1022546	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.705	1.706	0	1062924	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.580	3.574	1	232161	22	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\II\LCMSMS01.i\072121-DOD-2.b\072121040.d
Injection Date: 21-Jul-2021 18:58:08 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1137636	1142287			100.4	50 - 150
8 PFBA			1000.00	921.22	92.1	70 - 130
D 50 13C5_PFPeA	1166607	1151574			98.7	50 - 150
21 PFPeA			1000.00	906.55	90.7	70 - 130
7 PFBS			884.00	765.46	86.6	70 - 130
D 44 13C3_PFBS	325326	350403			107.7	50 - 150
1 4:2 FTS			934.00	917.27	98.2	70 - 130
D 63 13C2_4:2 FTS_2	362671	353823			97.6	50 - 150
D 49 13C5_PFHxA	1051765	1110257			105.6	50 - 150
15 PFHxA			1000.00	809.60	81	70 - 130
22 PFPeS			938.00	837.01	89.2	70 - 130
28 GenX			2000.00	2535.65	126.8	70 - 130
D 66 13C3_GenX	616778	586600			95.1	50 - 150
D 47 13C4_PFHpA	1067513	1060003			99.3	50 - 150
13 PFHpA			1000.00	835.15	83.5	70 - 130
D 45 13C3_PFHxS	290956	291375			100.1	50 - 150
14 PFHxS			910.00	899.21	98.8	70 - 130
29 ADONA			942.00	970.14	103	70 - 130
D 64 13C2_6:2 FTS_2	319985	306158			95.7	50 - 150
2 6:2 FTS			948.00	963.27	101.6	70 - 130
20 PFOA			1000.00	861.38	86.1	70 - 130
D 53 13C8_PFOA	979649	1044975			106.7	50 - 150
12 PFHpS			952.00	858.13	90.1	70 - 130
18 PFOS			928.00	880.34	94.9	70 - 130
D 54 13C8_PFOS	224981	253038			112.5	50 - 150
17 PFNA			1000.00	893.63	89.4	70 - 130
D 56 13C9_PFNA	1022766	995161			97.3	50 - 150
30 9Cl-PF3ONS			932.00	771.83	82.8	70 - 130
D 55 13C8_PFOSA	502649	435801			86.7	50 - 150
19 PFOSA			1000.00	1015.27	101.5	70 - 130
16 PFNS			960.00	809.11	84.3	70 - 130
D 65 13C2_8:2 FTS_2	233985	223232			95.4	50 - 150
3 8:2 FTS			958.00	946.59	98.8	70 - 130
10 PFDA			1000.00	966.88	96.7	70 - 130
D 51 13C6_PFDA	778816	842912			108.2	50 - 150
6 N-MeFOSAA			1000.00	1017.94	101.8	70 - 130

Report Date: 22-Jul-2021 14:28:05 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072121-DOD-2.b\072121040.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1136210	1104812			97.2	50 - 150
9 PFDS			964.00	826.80	85.8	70 - 130
25 PFUdA			1000.00	911.18	91.1	70 - 130
5 N-EtFOSAA			1000.00	983.74	98.4	70 - 130
D 60 d5-EtFOSAA	1136822	990742			87.2	50 - 150
D 52 13C7_PFUdA	755318	773910			102.5	50 - 150
D 61 d7-MeFOSE	144143	138922			96.4	50 - 150
32 MeFOSE			1000.00	1016.98	101.7	70 - 130
26 MeFOSA			1000.00	955.51	95.6	70 - 130
D 57 d3-MeFOSA	65937	60122			91.2	50 - 150
31 11Cl-PF3OUDS			942.00	785.77	83.4	70 - 130
D 62 d9-EtFOSE	139521	133082			95.4	50 - 150
33 EtFOSE			1000.00	954.36	95.4	70 - 130
D 59 d5-EtFOSA	58107	49949			86	50 - 150
27 EtFOSA			1000.00	1153.73	115.4	70 - 130
11 PFDoA			1000.00	942.69	94.3	70 - 130
D 38 13C2_PFDoA	692986	700048			101	50 - 150
4 10:2 FTS			964.00	705.89	73.2	70 - 130
34 PFDOS			968.00	775.94	80.2	70 - 130
24 PFTrDA			1000.00	725.97	72.6	70 - 130
23 PFTeDA			1000.00	926.17	92.6	70 - 130
D 42 13C2_PFTeDA	620886	615565			99.1	50 - 150
D 40 13C2_PFHxDA	382750	330189			86.3	50 - 150
35 PFHxDA			1000.00	996.52	99.7	70 - 130
36 PFODA			1000.00	1004.61	100.5	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\II\LCMSMS01.i\072121-DOD-2.b\072121040.d
Injection Date: 21-Jul-2021 18:58:08 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.706	1	1142287	23	>100:1			1000.00	1234.14	100.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.712	0/-1	1066271	23	>100:1			1000.00	921.22		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	0	1151574	17	>100:1			1000.00	1215.04	98.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	0/0	1041575	18	>100:1			1000.00	906.55		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	0	350403	17	>100:1			1000.00	1154.91	107.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	0/0	370765	18	>100:1	Target = 3.79		884.00	765.46		
298.9 > 99	44	2.118	2.118		100302	16	>100:1	3.69 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	1/1	298414	21	>100:1	Target = 3.30		938.00	837.01		
349 > 99	44	2.466	2.466		90609	18	>100:1	3.29 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.388	1	353823	20	>100:1			5000.00	7726.37	97.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.388	1/0	114073	20	>100:1	Target = 1.48		934.00	917.27		
327 > 81	63	2.388	2.388		76682	21	>100:1	1.48 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.431	2.431	1	1110257	21	>100:1			1000.00	1328.46	105.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.431	2.431	1/0	870563	20	>100:1	Target = 16.51		1000.00	809.60		
313 > 119	49	2.431	2.431		51727	21	>100:1	16.82 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	1	586600	23	>100:1			5000.00	3546.91	95.1	M
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	1/0	207614	22	>100:1	Target = 0.69		2000.00	2535.65		
285 > 185	66	2.553	2.553		240564	20	>100:1	0.86 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.809	1	1060003	21	>100:1			1000.00	1174.25	99.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	811365	19	>100:1	Target = 3.47		1000.00	835.15		
363 > 169	47	2.818	2.818		258096	20	>100:1	3.14 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.826	1	291375	19	>100:1			1000.00	1073.24	100.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.835	1/0	291284	31	>100:1	Target = 3.30	0.16	910.00	899.21		
399 > 99	45	2.827	2.835		87617	33	>100:1	3.32 (1.65-4.95)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.862	1/0	1432009	21	>100:1	Target = 2.54		942.00	970.14		
377 > 85	45	2.862	2.862		545544	21	>100:1	2.62 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.217	3.211	1/0	245372	24	>100:1	Target = 3.54		952.00	858.13		
449 > 99	45	3.217	3.211		66995	21	>100:1	3.66 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.185	3.172	1	306158	35	>100:1			5000.00	6892.54	95.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.185	3.185	1/0	110607	32	>100:1	Target = 1.46		948.00	963.27		
427 > 81	64	3.185	3.185		69924	24	>100:1	1.58 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.204	1	1044975	28	>100:1			1000.00	1164.90	106.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.211	3.204	1/0	900957	26	>100:1	Target = 2.72		1000.00	861.38		
413 > 169	53	3.211	3.204		337400	25	>100:1	2.67 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.582	1	253038	29	>100:1			1000.00	1111.16	112.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.582	1/0	249326	50	>100:1	Target = 3.88	0.24	928.00	880.34		M
499 > 99	54	3.582	3.582		65335	41	>100:1	3.81 (1.94-5.83)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.792	3.784	1/0	560575	21	>100:1			932.00	771.83		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.919	3.911	1/0	173121	25	>100:1	Target = 3.09		960.00	809.11		
549 > 99	54	3.926	3.911		56576	20	>100:1	3.05 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.220	4.218	1/0	207351	18	>100:1	Target = 3.32		964.00	826.80		
599 > 99	54	4.220	4.218		61605	17	>100:1	3.36 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.377	4.375	1/0	509761	18	>100:1			942.00	785.77		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.722	4.715	1/0	171932	21	>100:1	Target = 3.35		968.00	775.94		
699 > 99	54	4.722	4.715		58270	28		2.95 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.590	3.582	1	995161	24	>100:1			1000.00	1118.91	97.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.590	3.582	1/0	754363	21	>100:1	Target = 4.81		1000.00	893.63		
463 > 169	56	3.590	3.582		161248	31	>100:1	4.67 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.873	3.865	1	435801	23	>100:1			1000.00	967.03	86.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.873	3.858	1/0	450844	22	>100:1	Target = 40.56		1000.00	1015.27		
498>478	55	3.866	3.858		10384	14	64:1	43.41 (20.28-60.84)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.926	3.918	1	223232	21	>100:1			5000.00	6848.33	95.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.926	3.926	1/0	68295	25	>100:1	Target = 1.50		958.00	946.59		
527 > 81	65	3.919	3.926		47327	22	>100:1	1.44 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.516	4.515	1/0	62390	20		Target = 2.24		964.00	705.89		
627 > 80	65	4.516	4.515		29213	16	>100:1	2.13 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.926	1	842912	23	>100:1			1000.00	1111.64	108.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.934	3.926	2/1	741701	21	>100:1	Target = 9.65		1000.00	966.88		
513 > 169	51	3.926	3.926		62687	19	>100:1	11.83 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.087	4.079	1	1104812	20	>100:1			5000.00	5525.51	97.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.095	4.095	1/0	172829	39	>100:1	Target = 1.47	0.10	1000.00	1017.94		M
570 > 483	58	4.095	4.095		119035	34	>100:1	1.45 (0.73-2.21)	0.22				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.238	4.237	1	990742	18	>100:1			5000.00	5516.81	87.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.247	4.237	1/0	194697	38	>100:1	Target = 1.78	0.06	1000.00	983.74		M
584 > 526	60	4.247	4.237		112757	34	>100:1	1.72 (0.89-2.67)	0.17				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.238	4.227	1	773910	18	>100:1			1000.00	1035.55	102.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.238	4.237	1/0	622436	18	>100:1	Target = 9.77		1000.00	911.18		
563 > 169	52	4.238	4.237		61843	17	>100:1	10.06 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.294	4.284	1	138922	20	>100:1			1000.00	799.10	96.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.303	4.293	1/0	127217	20	>100:1			1000.00	1016.98		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.313	4.302	1	60122	25	>100:1			1000.00	965.66	91.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.322	4.302	1/0	60854	16	87:1	Target = 1.18		1000.00	955.51		
512 > 219	57	4.313	4.302		54062	16	>100:1	1.12 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.458	4.444	1	133082	26	>100:1			1000.00	840.00	95.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.467	4.457	1/0	106257	18	>100:1			1000.00	954.36		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.475	4.465	1	49949	19	>100:1			1000.00	818.24	86	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.483	4.474	1/0	59825	15	>100:1	Target = 1.11		1000.00	1153.73		
526 > 219	59	4.483	4.474		53907	13	>100:1	1.10 (0.55-1.67)					M
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.508	4.506	1	700048	18	>100:1			1000.00	904.21	101	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.508	4.498	1/0	635030	19	>100:1	Target = 7.48		1000.00	942.69		
613 > 169	38	4.508	4.498		78243	19		8.11 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.747	4.746	1/0	215560	21	>100:1	Target = 3.23		1000.00	725.97		
663 > 169	38	4.747	4.746		73839	23	>100:1	2.91 (1.61-4.85)					M
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.968	4.958	1	615565	20	>100:1			1000.00	744.66	99.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.968	4.958	1/0	458417	19	61:1	Target = 8.62		1000.00	926.17		
713 > 169	42	4.968	4.958		45784	19	>100:1	10.01 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.352	5.351	1	330189	20	>100:1			1000.00	647.06	86.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.352	5.351	1/0	506312	20	53:1	Target = 12.71		1000.00	996.52		
813 > 269	40	5.352	5.351		34879	20	>100:1	14.51 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.727	5.733	1/0	401187	26	55:1	Target = 113.87		1000.00	1004.61		
913 > 319	40	5.727	5.733		3962	24	>100:1	101.25 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.934	3.926	1	775650	22	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.431	2.431	0	898982	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.211	3.204	1	1009625	32	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.705	1.706	0	1059825	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.574	1	228076	23	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD.b\072121005.d
Injection Date: 21-Jul-2021 12:47:32 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	960189	1137636			118.5	50 - 150
8 PFBA			100.00	108.07	108.1	70 - 130
D 50 13C5_PFPeA	979583	1166607			119.1	50 - 150
21 PFPeA			100.00	95.068	95.1	70 - 130
7 PFBS			88.400	85.848	97.1	70 - 130
D 44 13C3_PFBS	316591	325326			102.8	50 - 150
1 4:2 FTS			93.400	106.06	113.6	70 - 130
D 63 13C2_4:2 FTS_2	251776	362671			144	50 - 150
D 49 13C5_PFHxA	862788	1051765			121.9	50 - 150
15 PFHxA			100.00	93.486	93.5	70 - 130
22 PFPeS			93.800	101.45	108.2	70 - 130
28 GenX			200.00	235.90	118	70 - 130
D 66 13C3_GenX	897310	616778			68.7	50 - 150
D 47 13C4_PFHpA	907666	1067513			117.6	50 - 150
13 PFHpA			100.00	83.025	83	70 - 130
D 45 13C3_PFHxS	303002	290956			96	50 - 150
14 PFHxS			91.000	91.242	100.3	70 - 130
29 ADONA			94.200	100.86	107.1	70 - 130
D 64 13C2_6:2 FTS_2	244810	319985			130.7	50 - 150
2 6:2 FTS			94.800	109.24	115.2	70 - 130
20 PFOA			100.00	98.932	98.9	70 - 130
D 53 13C8_PFOA	921507	979649			106.3	50 - 150
12 PFHpS			95.200	95.637	100.5	70 - 130
18 PFOS			92.800	90.948	98	70 - 130
D 54 13C8_PFOS	232494	224981			96.8	50 - 150
17 PFNA			100.00	103.77	103.8	70 - 130
D 56 13C9_PFNA	901596	1022766			113.4	50 - 150
30 9Cl-PF3ONS			93.200	110.46	118.5	70 - 130
D 55 13C8_PFOSA	459073	502649			109.5	50 - 150
19 PFOSA			100.00	83.738	83.7	70 - 130
16 PFNS			96.000	104.47	108.8	70 - 130
D 65 13C2_8:2 FTS_2	168869	233985			138.6	50 - 150
3 8:2 FTS			95.800	120.66	126	70 - 130
10 PFDA			100.00	102.03	102	70 - 130
D 51 13C6_PFDA	831393	778816			93.7	50 - 150
6 N-MeFOSAA			100.00	109.97	110	70 - 130

Report Date: 21-Jul-2021 15:25:26 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072121-DOD.b\072121005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	941259	1136210			120.7	50 - 150
9 PFDS			96.400	109.67	113.8	70 - 130
25 PFUdA			100.00	106.21	106.2	70 - 130
5 N-EtFOSAA			100.00	104.00	104	70 - 130
D 60 d5-EtFOSAA	956597	1136822			118.8	50 - 150
D 52 13C7_PFUdA	803090	755318			94.1	50 - 150
D 61 d7-MeFOSE	176335	144143			81.7	50 - 150
32 MeFOSE			100.00	119.30	119.3	70 - 130
26 MeFOSA			100.00	103.64	103.6	70 - 130
D 57 d3-MeFOSA	62206	65937			106	50 - 150
31 11Cl-PF3OUDS			94.200	96.226	102.2	70 - 130
D 62 d9-EtFOSE	156993	139521			88.9	50 - 150
33 EtFOSE			100.00	100.78	100.8	70 - 130
D 59 d5-EtFOSA	64110	58107			90.6	50 - 150
27 EtFOSA			100.00	123.97	124	70 - 130
11 PFDoA			100.00	104.78	104.8	70 - 130
D 38 13C2_PFDoA	788291	692986			87.9	50 - 150
4 10:2 FTS			96.400	70.119	72.7	70 - 130
34 PFDOS			96.800	104.58	108	70 - 130
24 PFTrDA			100.00	79.403	79.4	70 - 130
23 PFTeDA			100.00	95.221	95.2	70 - 130
D 42 13C2_PFTeDA	844286	620886			73.5	50 - 150
D 40 13C2_PFHxDA	524461	382750			73	50 - 150
35 PFHxDA			100.00	114.81	114.8	70 - 130
36 PFODA			100.00	94.054	94.1	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD.b\072121005.d
Injection Date: 21-Jul-2021 12:47:32 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.706	1	1137636	22	>100:1			1000.00	1229.11	118.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.712	1/0	124572	21	42:1			100.00	108.07		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	0	1166607	17	>100:1			1000.00	1230.90	119.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	0/0	110654	17	>100:1			100.00	95.068		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	0	325326	16	>100:1			1000.00	1072.26	102.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	0/0	38606	25	>100:1	Target = 3.79		88.400	85.848		
298.9 > 99	44	2.118	2.118		12324	19	95:1	3.13 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	0/0	33582	19	>100:1	Target = 3.30		93.800	101.45		
349 > 99	44	2.466	2.466		9708	18	>100:1	3.45 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	0	362671	20	>100:1			5000.00	7919.58	144	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.388	0/0	13520	20	>100:1	Target = 1.48		93.400	106.06		
327 > 81	63	2.396	2.388		9390	10	71:1	1.43 (0.74-2.22)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.431	2.431	0	1051765	20	>100:1			1000.00	1258.47	121.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.431	2.431	0/0	95230	18	>100:1	Target = 16.51		100.00	93.486		
313 > 119	49	2.422	2.431		6802	19	31:1	14.00 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	1	616778	21	>100:1			5000.00	3729.38	68.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	0/-1	20309	19	75:1	Target = 0.69		200.00	235.90		
285 > 185	66	2.553	2.553		28695	21	91:1	0.70 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.809	0	1067513	20	>100:1			1000.00	1182.57	117.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/1	81232	19	>100:1	Target = 3.47		100.00	83.025		
363 > 169	47	2.818	2.818		27763	21	86:1	2.92 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.826	2.826	0	290956	20	>100:1			1000.00	1071.70	96	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.835	0/0	29514	28	>100:1	Target = 3.30	0.15	91.000	91.242		
399 > 99	45	2.826	2.835		11174	27	91:1	2.64 (1.65-4.95)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.862	1/1	148668	20	>100:1	Target = 2.54		94.200	100.86		
377 > 85	45	2.853	2.862		60978	18	>100:1	2.43 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.211	3.211	0/0	27307	23	>100:1	Target = 3.54		95.200	95.637		M
449 > 99	45	3.211	3.211		8784	26	56:1	3.10 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.172	3.172	0	319985	31	>100:1			5000.00	7203.83	130.7	M
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.185	3.185	2/2	20007	22	85:1	Target = 1.46		94.800	109.24		M
427 > 81	64	3.172	3.185		16514	28	98:1	1.21 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.204	3.204	1	979649	24	>100:1			1000.00	1092.08	106.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.204	3.204	1/0	97009	21	47:1	Target = 2.72		100.00	98.932		
413 > 169	53	3.198	3.204		34758	21	61:1	2.79 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.582	1	224981	23	>100:1			1000.00	987.95	96.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.582	0/-1	27012	49	85:1	Target = 3.88	0.30	92.800	90.948		
499 > 99	54	3.567	3.582		7766	38	53:1	3.47 (1.94-5.83)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.784	3.784	1/0	71331	22	>100:1			93.200	110.46		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.911	3.911	1/0	19874	25	>100:1	Target = 3.09		96.000	104.47		
549 > 99	54	3.911	3.911		4358	14	31:1	4.56 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.218	4.218	1/0	24454	17	>100:1	Target = 3.32		96.400	109.67		
599 > 99	54	4.210	4.218		6662	22	46:1	3.67 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.375	4.375	1/0	55504	19	>100:1			94.200	96.226		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.715	4.715	1/0	20603	19	>100:1	Target = 3.35		96.800	104.58		
699 > 99	54	4.715	4.715		6191	27	86:1	3.32 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.582	1	1022766	22	>100:1			1000.00	1149.95	113.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.582	3.582	0/-1	90030	22	>100:1	Target = 4.81		100.00	103.77		
463 > 169	56	3.582	3.582		19514	20	>100:1	4.61 (2.40-7.21)					M
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.865	3.865	1	502649	21	>100:1			1000.00	1115.37	109.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.858	3.858	0/-1	42889	21	57:1	Target = 40.56		100.00	83.738		
498>478	55	3.858	3.858		1410	15	9.8:1	30.41 (20.28-60.84)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.918	3.918	1	233985	19	>100:1			5000.00	7178.21	138.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.926	3.926	1/0	9125	17	56:1	Target = 1.50		95.800	120.66		
527 > 81	65	3.911	3.926		5578	23	29:1	1.63 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.515	4.515	1/0	6496	19	72:1	Target = 2.24		96.400	70.119		
627 > 80	65	4.523	4.515		3172	24	35:1	2.04 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.926	3.926	1	778816	20	>100:1			1000.00	1027.11	93.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.926	3.926	1/0	72316	20	>100:1	Target = 9.65		100.00	102.03		
513 > 169	51	3.926	3.926		7756	17	49:1	9.32 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.079	4.079	1	1136210	20	>100:1			5000.00	5682.54	120.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.095	4.095	0/-1	19201	32	99:1	Target = 1.47	0.09	100.00	109.97		M
570 > 483	58	4.079	4.095		12971	35		1.48 (0.73-2.21)	0.21				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.237	4.237	1	1136822	19	>100:1			5000.00	6330.23	118.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.237	4.237	1/0	23618	33	>100:1	Target = 1.78		100.00	104.00		M
584 > 526	60	4.237	4.237		13827	32	31:1	1.70 (0.89-2.67)	0.26				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.227	4.227	1	755318	17	>100:1			1000.00	1010.67	94.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.237	4.237	1/0	70813	19	>100:1	Target = 9.77		100.00	106.21		
563 > 169	52	4.227	4.237		5944	14	23:1	11.91 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.284	4.284	1	144143	18	>100:1			1000.00	829.13	81.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.293	4.293	1/0	15485	18	28:1			100.00	119.30		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.302	4.302	1	65937	16	57:1			1000.00	1059.06	106	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.302	1/0	7239	16	43:1	Target = 1.18		100.00	103.64		
512 > 219	57	4.312	4.302		5988	16	20:1	1.20 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.444	4.444	1	139521	21	>100:1			1000.00	880.64	88.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.457	1/0	11764	17	45:1			100.00	100.78		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.465	1	58107	20	>100:1			1000.00	951.88	90.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.474	4.474	1/0	7478	22	38:1	Target = 1.11		100.00	123.97		
526 > 219	59	4.474	4.474		7362	21	31:1	1.01 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.506	4.506	1	692986	19	>100:1			1000.00	895.09	87.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.498	4.498	1/0	69872	23	39:1	Target = 7.48		100.00	104.78		
613 > 169	38	4.506	4.498		8409	16	85:1	8.30 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.746	4.746	1/0	23339	20	68:1	Target = 3.23		100.00	79.403		
663 > 169	38	4.746	4.746		7209	19	87:1	3.23 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.958	4.958	1	620886	21	>100:1			1000.00	751.10	73.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.958	4.958	1/0	47538	17	14:1	Target = 8.62		100.00	95.221		
713 > 169	42	4.958	4.958		6661	22	70:1	7.13 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.351	5.351	1	382750	19	>100:1			1000.00	750.06	73	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.351	5.351	1/0	67618	19	>100:1	Target = 12.71		100.00	114.81		
813 > 269	40	5.351	5.351		4303	16	76:1	15.71 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.733	5.733	0/-1	43539	25	>100:1	Target = 113.87		100.00	94.054		
913 > 319	40	5.726	5.733		439	28	41:1	99.17 (56.93-170.81)					M
*** 37 13C2_PFDA**													
515 > 470		3.926	3.926	1	764359	21	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.431	2.431	0	917509	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.204	3.204	1	1002619	25	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.706	0	1081283	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.574	3.574	1	273592	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD.b\072121006.d
Injection Date: 21-Jul-2021 12:58:04 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1137636	1159841			102	50 - 150
8 PFBA			200.00	210.07	105	70 - 130
D 50 13C5_PFPeA	1166607	1175645			100.8	50 - 150
21 PFPeA			200.00	204.55	102.3	70 - 130
7 PFBS			176.80	174.03	98.4	70 - 130
D 44 13C3_PFBS	325326	340068			104.5	50 - 150
1 4:2 FTS			186.80	156.02	83.5	70 - 130
D 63 13C2_4:2 FTS_2	362671	425317			117.3	50 - 150
D 49 13C5_PFHxA	1051765	1058790			100.7	50 - 150
15 PFHxA			200.00	193.79	96.9	70 - 130
22 PFPeS			187.60	198.96	106.1	70 - 130
28 GenX			400.00	507.28	126.8	70 - 130
D 66 13C3_GenX	616778	692842			112.3	50 - 150
D 47 13C4_PFHpA	1067513	1129218			105.8	50 - 150
13 PFHpA			200.00	179.71	89.9	70 - 130
D 45 13C3_PFHxS	290956	309810			106.5	50 - 150
14 PFHxS			182.00	170.93	93.9	70 - 130
29 ADONA			188.40	196.90	104.5	70 - 130
D 64 13C2_6:2 FTS_2	319985	328061			102.5	50 - 150
2 6:2 FTS			189.60	222.63	117.4	70 - 130
20 PFOA			200.00	189.31	94.7	70 - 130
D 53 13C8_PFOA	979649	1031674			105.3	50 - 150
12 PFHpS			190.40	177.06	93	70 - 130
18 PFOS			185.60	169.51	91.3	70 - 130
D 54 13C8_PFOS	224981	260952			116	50 - 150
17 PFNA			200.00	203.93	102	70 - 130
D 56 13C9_PFNA	1022766	1002289			98	50 - 150
30 9Cl-PF3ONS			186.40	184.18	98.8	70 - 130
D 55 13C8_PFOSA	502649	509260			101.3	50 - 150
19 PFOSA			200.00	193.69	96.8	70 - 130
16 PFNS			192.00	208.01	108.3	70 - 130
D 65 13C2_8:2 FTS_2	233985	230735			98.6	50 - 150
3 8:2 FTS			191.60	205.65	107.3	70 - 130
10 PFDA			200.00	205.35	102.7	70 - 130
D 51 13C6_PFDA	778816	892746			114.6	50 - 150
6 N-MeFOSAA			200.00	218.41	109.2	70 - 130

Report Date: 21-Jul-2021 15:25:28 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072121-DOD.b\072121006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1136210	1197877			105.4	50 - 150
9 PFDS			192.80	171.95	89.2	70 - 130
25 PFUdA			200.00	201.08	100.5	70 - 130
5 N-EtFOSAA			200.00	203.67	101.8	70 - 130
D 60 d5-EtFOSAA	1136822	1099414			96.7	50 - 150
D 52 13C7_PFUdA	755318	819955			108.6	50 - 150
D 61 d7-MeFOSE	144143	158779			110.2	50 - 150
32 MeFOSE			200.00	208.13	104.1	70 - 130
26 MeFOSA			200.00	232.52	116.3	70 - 130
D 57 d3-MeFOSA	65937	63578			96.4	50 - 150
31 11Cl-PF3OUDS			188.40	190.59	101.2	70 - 130
D 62 d9-EtFOSE	139521	147402			105.6	50 - 150
33 EtFOSE			200.00	196.01	98	70 - 130
D 59 d5-EtFOSA	58107	62485			107.5	50 - 150
27 EtFOSA			200.00	202.09	101	70 - 130
11 PFDoA			200.00	189.83	94.9	70 - 130
D 38 13C2_PFDoA	692986	728676			105.2	50 - 150
4 10:2 FTS			192.80	198.30	102.9	70 - 130
34 PFDOS			193.60	168.67	87.1	70 - 130
24 PFTrDA			200.00	174.04	87	70 - 130
23 PFTeDA			200.00	190.45	95.2	70 - 130
D 42 13C2_PFTeDA	620886	704996			113.5	50 - 150
D 40 13C2_PFHxDA	382750	391896			102.4	50 - 150
35 PFHxDA			200.00	214.10	107	70 - 130
36 PFODA			200.00	187.24	93.6	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD.b\072121006.d
Injection Date: 21-Jul-2021 12:58:04 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.706	1	1159841	22	>100:1			1000.00	1253.10	102	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.712	0/-1	246882	21	83:1			200.00	210.07		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	1	1175645	18	>100:1			1000.00	1240.44	100.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	1/0	239929	15	>100:1			200.00	204.55		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.118	1	340068	16	>100:1			1000.00	1120.85	104.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	1/0	81810	17	>100:1	Target = 3.79		176.80	174.03		
298.9 > 99	44	2.118	2.118		22783	15	>100:1	3.59 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.466	1/0	68843	21	>100:1	Target = 3.30		187.60	198.96		
349 > 99	44	2.466	2.466		21067	18	>100:1	3.26 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	1	425317	20	>100:1			5000.00	9287.57	117.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.388	1/0	23324	18	>100:1	Target = 1.48		186.80	156.02		
327 > 81	63	2.388	2.388		13536	11	>100:1	1.72 (0.74-2.22)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.431	1	1058790	19	>100:1			1000.00	1266.88	100.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.432	2.431	1/0	198720	18	>100:1	Target = 16.51		200.00	193.79		
313 > 119	49	2.432	2.431		12136	17	44:1	16.37 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.553	1	692842	22	>100:1			5000.00	4189.31	112.3	M
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.553	2.553	1/0	49058	21	>100:1	Target = 0.69		400.00	507.28		
285 > 185	66	2.553	2.553		57423	20	>100:1	0.85 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.809	1	1129218	20	>100:1			1000.00	1250.92	105.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	185994	21	>100:1	Target = 3.47		200.00	179.71		
363 > 169	47	2.818	2.818		58027	18	>100:1	3.20 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.826	1	309810	20	>100:1			1000.00	1141.14	106.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.835	0/-1	58875	30	>100:1	Target = 3.30	0.19	182.00	170.93		
399 > 99	45	2.827	2.835		19455	30	>100:1	3.02 (1.65-4.95)	0.09				M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.862	1/0	309032	18	>100:1	Target = 2.54		188.40	196.90		
377 > 85	45	2.853	2.862		119219	20	>100:1	2.59 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.211	0/-1	53832	28	>100:1	Target = 3.54		190.40	177.06		
449 > 99	45	3.208	3.211		15443	23	84:1	3.48 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.177	3.172	1	328061	26	>100:1			5000.00	7385.65	102.5	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													a
427 > 407	64	3.183	3.185	2/1	33524	25	>100:1	Target = 1.46		189.60	222.63		
427 > 81	64	3.183	3.185		23809	26	>100:1	1.40 (0.73-2.19)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.204	0	1031674	25	>100:1			1000.00	1150.07	105.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.204	0/0	195492	22	>100:1	Target = 2.72		200.00	189.31		
413 > 169	53	3.202	3.204		75721	25	>100:1	2.58 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.579	3.582	0	260952	24	>100:1			1000.00	1145.91	116	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.579	3.582	0/0	53803	40	>100:1	Target = 3.88	0.22	185.60	169.51		
499 > 99	54	3.572	3.582		15625	42	>100:1	3.44 (1.94-5.83)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.782	3.784	0/0	137955	22	>100:1			186.40	184.18		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.916	3.911	1/1	45898	20	>100:1	Target = 3.09		192.00	208.01		
549 > 99	54	3.923	3.911		14624	25	55:1	3.13 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.217	4.218	0/0	44472	17		Target = 3.32		192.80	171.95		
599 > 99	54	4.217	4.218		14437	18	45:1	3.08 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.374	4.375	0/0	127512	21	>100:1			188.40	190.59		M
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.714	4.715	0/0	38542	21	>100:1	Target = 3.35		193.60	168.67		
699 > 99	54	4.721	4.715		13226	21	>100:1	2.91 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.587	3.582	1	1002289	23	>100:1			1000.00	1126.93	98	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.587	3.582	1/0	173384	21	>100:1	Target = 4.81		200.00	203.93		
463 > 169	56	3.579	3.582		35657	22	>100:1	4.86 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.865	0	509260	22	>100:1			1000.00	1130.04	101.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.858	1/1	100510	20	>100:1	Target = 40.56		200.00	193.69		
498>478	55	3.855	3.858		2423	24	25:1	41.48 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.916	3.918	0	230735	20				5000.00	7078.51	98.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.916	3.926	0/0	15336	23	82:1	Target = 1.50		191.60	205.65		
527 > 81	65	3.916	3.926		10762	27		1.42 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.514	4.515	0/0	18116	24		Target = 2.24		192.80	198.30		
627 > 80	65	4.506	4.515		5589	18	55:1	3.24 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.923	3.926	0	892746	20	>100:1			1000.00	1177.36	114.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.923	3.926	0/0	166842	21	>100:1	Target = 9.65		200.00	205.35		
513 > 169	51	3.931	3.926		16352	24	71:1	10.20 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.079	0	1197877	19	>100:1			5000.00	5990.95	105.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.085	4.095	0/0	40206	40	>100:1	Target = 1.47	0.10	200.00	218.41		M
570 > 483	58	4.085	4.095		24413	32	>100:1	1.64 (0.73-2.21)	0.22				
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.235	4.237	0	1099414	17	>100:1			5000.00	6121.93	96.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.245	4.237	1/1	44730	34	>100:1	Target = 1.78	0.12	200.00	203.67		M
584 > 526	60	4.235	4.237		24905	37	58:1	1.79 (0.89-2.67)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.235	4.227	1	819955	19	>100:1			1000.00	1097.16	108.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.235	4.237	0/-1	145533	19	>100:1	Target = 9.77		200.00	201.08		
563 > 169	52	4.235	4.237		14643	19	49:1	9.93 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.284	0	158779	16	>100:1			1000.00	913.32	110.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.293	0/0	29757	14	60:1			200.00	208.13		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.302	0	63578	16	4.4:1			1000.00	1021.17	96.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.310	4.302	1/1	15660	12	75:1	Target = 1.18		200.00	232.52		M
512 > 219	57	4.310	4.302		13635	13	73:1	1.14 (0.59-1.78)					M
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.444	0	147402	28	>100:1			1000.00	930.38	105.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.457	0/0	24172	14	79:1			200.00	196.01		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.465	0	62485	20	>100:1			1000.00	1023.60	107.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.474	0/0	13109	17	>100:1	Target = 1.11		200.00	202.09		
526 > 219	59	4.473	4.474		13198	18	65:1	0.99 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.506	4.506	0	728676	19	>100:1			1000.00	941.19	105.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.506	4.498	1/1	133104	17	76:1	Target = 7.48		200.00	189.83		
613 > 169	38	4.506	4.498		19103	17	>100:1	6.96 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.739	4.746	0/0	53792	21	>100:1	Target = 3.23		200.00	174.04		
663 > 169	38	4.739	4.746		17477	32	>100:1	3.07 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.958	4.958	0	704996	20	>100:1			1000.00	852.85	113.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.966	4.958	1/1	107961	17	14:1	Target = 8.62		200.00	190.45		
713 > 169	42	4.966	4.958		12358	29	>100:1	8.73 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.348	5.351	0	391896	18	>100:1			1000.00	767.98	102.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.348	5.351	0/0	129108	19	11:1	Target = 12.71		200.00	214.10		
813 > 269	40	5.348	5.351		8379	17	>100:1	15.40 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.723	5.733	0/0	88748	22	9.5:1	Target = 113.87		200.00	187.24		
913 > 319	40	5.730	5.733		828	21	72:1	107.18 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.923	3.926	0	832794	21	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.432	2.431	1	999896	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.204	0	1068637	26	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.706	1	1173775	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.579	3.574	1	265902	30	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD.b\072121015.d
Injection Date: 21-Jul-2021 14:33:14 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 8
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1137636	1198989			105.4	50 - 150
8 PFBA			1000.00	900.28	90	70 - 130
D 50 13C5_PFPeA	1166607	1149426			98.5	50 - 150
21 PFPeA			1000.00	912.96	91.3	70 - 130
7 PFBS			884.00	778.90	88.1	70 - 130
D 44 13C3_PFBS	325326	321861			98.9	50 - 150
1 4:2 FTS			934.00	1052.88	112.7	70 - 130
D 63 13C2_4:2 FTS_2	362671	329672			90.9	50 - 150
D 49 13C5_PFHxA	1051765	988045			93.9	50 - 150
15 PFHxA			1000.00	964.09	96.4	70 - 130
22 PFPeS			938.00	862.53	92	70 - 130
28 GenX			2000.00	2473.03	123.7	70 - 130
D 66 13C3_GenX	616778	563395			91.3	50 - 150
D 47 13C4_PFHpA	1067513	1034986			97	50 - 150
13 PFHpA			1000.00	900.07	90	70 - 130
D 45 13C3_PFHxS	290956	286838			98.6	50 - 150
14 PFHxS			910.00	863.09	94.8	70 - 130
29 ADONA			942.00	987.06	104.8	70 - 130
D 64 13C2_6:2 FTS_2	319985	281138			87.9	50 - 150
2 6:2 FTS			948.00	975.71	102.9	70 - 130
20 PFOA			1000.00	883.88	88.4	70 - 130
D 53 13C8_PFOA	979649	1009659			103.1	50 - 150
12 PFHpS			952.00	853.23	89.6	70 - 130
18 PFOS			928.00	744.10	80.2	70 - 130
D 54 13C8_PFOS	224981	272695			121.2	50 - 150
17 PFNA			1000.00	938.65	93.9	70 - 130
D 56 13C9_PFNA	1022766	1013634			99.1	50 - 150
30 9Cl-PF3ONS			932.00	757.25	81.3	70 - 130
D 55 13C8_PFOSA	502649	419658			83.5	50 - 150
19 PFOSA			1000.00	984.38	98.4	70 - 130
16 PFNS			960.00	852.94	88.8	70 - 130
D 65 13C2_8:2 FTS_2	233985	204506			87.4	50 - 150
3 8:2 FTS			958.00	1044.98	109.1	70 - 130
10 PFDA			1000.00	807.74	80.8	70 - 130
D 51 13C6_PFDA	778816	888853			114.1	50 - 150
6 N-MeFOSAA			1000.00	996.40	99.6	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1136210	1071077			94.3	50 - 150
9 PFDS			964.00	763.54	79.2	70 - 130
25 PFUdA			1000.00	893.45	89.3	70 - 130
5 N-EtFOSAA			1000.00	925.35	92.5	70 - 130
D 60 d5-EtFOSAA	1136822	1060298			93.3	50 - 150
D 52 13C7_PFUdA	755318	766361			101.5	50 - 150
D 61 d7-MeFOSE	144143	131969			91.6	50 - 150
32 MeFOSE			1000.00	1096.83	109.7	70 - 130
26 MeFOSA			1000.00	1061.26	106.1	70 - 130
D 57 d3-MeFOSA	65937	56588			85.8	50 - 150
31 11Cl-PF3OUDS			942.00	757.07	80.4	70 - 130
D 62 d9-EtFOSE	139521	132073			94.7	50 - 150
33 EtFOSE			1000.00	970.15	97	70 - 130
D 59 d5-EtFOSA	58107	53350			91.8	50 - 150
27 EtFOSA			1000.00	1151.63	115.2	70 - 130
11 PFDoA			1000.00	878.76	87.9	70 - 130
D 38 13C2_PFDoA	692986	721445			104.1	50 - 150
4 10:2 FTS			964.00	838.52	87	70 - 130
34 PFDOS			968.00	767.76	79.3	70 - 130
24 PFTrDA			1000.00	764.48	76.4	70 - 130
23 PFTeDA			1000.00	851.94	85.2	70 - 130
D 42 13C2_PFTeDA	620886	660111			106.3	50 - 150
D 40 13C2_PFHxDA	382750	340223			88.9	50 - 150
35 PFHxDA			1000.00	1039.46	103.9	70 - 130
36 PFODA			1000.00	1057.99	105.8	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072121-DOD.b\072121015.d
Injection Date: 21-Jul-2021 14:33:14 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 8
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.702	1.706	0	1198989	23	>100:1			1000.00	1295.40	105.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.712	0/0	1093757	22	>100:1			1000.00	900.28		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.066	1	1149426	18	>100:1			1000.00	1212.78	98.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.066	1/0	1046993	18	>100:1			1000.00	912.96		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.118	1	321861	17	>100:1			1000.00	1060.84	98.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.118	1/0	346542	17	>100:1	Target = 3.79		884.00	778.90		
298.9 > 99	44	2.120	2.118		98625	18	>100:1	3.51 (1.89-5.68)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.460	2.466	0/-1	282462	20	>100:1	Target = 3.30		938.00	862.53		
349 > 99	44	2.460	2.466		92167	20	>100:1	3.06 (1.65-4.95)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.390	2.388	1	329672	20	>100:1			5000.00	7198.99	90.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.390	2.388	1/0	122000	21		Target = 1.48		934.00	1052.88		
327 > 81	63	2.390	2.388		73690	20	>100:1	1.65 (0.74-2.22)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.425	2.431	0	988045	20	>100:1			1000.00	1182.23	93.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.425	2.431	0/0	922569	20	>100:1	Target = 16.51		1000.00	964.09		
313 > 119	49	2.425	2.431		47262	19	>100:1	19.52 (8.25-24.77)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.547	2.553	0	563395	19	>100:1			5000.00	3406.60	91.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.547	2.553	0/0	194477	19	>100:1	Target = 0.69		2000.00	2473.03		
285 > 185	66	2.547	2.553		247005	20	>100:1	0.78 (0.34-1.04)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.814	2.809	1	1034986	20	>100:1			1000.00	1146.53	97	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.805	2.818	0/-1	853793	21	>100:1	Target = 3.47		1000.00	900.07		
363 > 169	47	2.814	2.818		262274	19	>100:1	3.25 (1.73-5.21)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.832	2.826	1	286838	20	>100:1			1000.00	1056.53	98.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.832	2.835	0/-1	275231	29	>100:1	Target = 3.30	0.15	910.00	863.09		
399 > 99	45	2.832	2.835		79784	28	>100:1	3.44 (1.65-4.95)	0.08				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.849	2.862	0/-1	1434304	20	>100:1	Target = 2.54		942.00	987.06		
377 > 85	45	2.849	2.862		535919	19	>100:1	2.67 (1.27-3.82)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.211	0/-1	240174	25	>100:1	Target = 3.54		952.00	853.23		
449 > 99	45	3.202	3.211		68757	25	>100:1	3.49 (1.77-5.31)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.183	3.172	1	281138	25	>100:1			5000.00	6329.27	87.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.177	3.185	0/-1	102792	36	>100:1	Target = 1.46		948.00	975.71		
427 > 81	64	3.177	3.185		58198	23	>100:1	1.76 (0.73-2.19)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.204	0	1009659	25	>100:1			1000.00	1125.53	103.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.204	0/0	893242	26	>100:1	Target = 2.72		1000.00	883.88		
413 > 169	53	3.202	3.204		327124	24	>100:1	2.73 (1.36-4.08)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.572	3.582	0	272695	22	>100:1			1000.00	1197.47	121.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.579	3.582	0/0	227970	41	>100:1	Target = 3.88	0.26	928.00	744.10		
499 > 99	54	3.572	3.582		57480	37	>100:1	3.96 (1.94-5.83)	0.12				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.782	3.784	0/0	592714	24	>100:1			932.00	757.25		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.911	0/0	196676	23	>100:1	Target = 3.09		960.00	852.94		
549 > 99	54	3.915	3.911		52212	22		3.76 (1.54-4.64)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.218	0/0	206360	20	>100:1	Target = 3.32		964.00	763.54		
599 > 99	54	4.208	4.218		64199	25	>100:1	3.21 (1.66-4.99)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.375	0/0	529297	18	>100:1			942.00	757.07		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.714	4.715	0/0	183335	20	>100:1	Target = 3.35		968.00	767.76		
699 > 99	54	4.707	4.715		51169	20	>100:1	3.58 (1.67-5.03)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.579	3.582	0	1013634	22	>100:1			1000.00	1139.68	99.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.579	3.582	0/0	807078	23	>100:1	Target = 4.81		1000.00	938.65		
463 > 169	56	3.579	3.582		152873	21	>100:1	5.27 (2.40-7.21)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.865	0	419658	20	>100:1			1000.00	931.21	83.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.858	1/1	420934	20	>100:1	Target = 40.56		1000.00	984.38		
498>478	55	3.870	3.858		11665	28	83:1	36.08 (20.28-60.84)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.915	3.918	0	204506	20	>100:1			5000.00	6273.85	87.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.915	3.926	0/0	69069	20	>100:1	Target = 1.50		958.00	1044.98		
527 > 81	65	3.915	3.926		44097	18		1.56 (0.75-2.26)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.505	4.515	0/0	67896	18	>100:1	Target = 2.24		964.00	838.52		
627 > 80	65	4.513	4.515		26686	17	>100:1	2.54 (1.12-3.37)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.931	3.926	1	888853	19	>100:1			1000.00	1172.23	114.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.931	3.926	1/0	653398	22	>100:1	Target = 9.65		1000.00	807.74		M
513 > 169	51	3.915	3.926		69658	20	>100:1	9.38 (4.82-14.47)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.079	0	1071077	19	>100:1			5000.00	5356.79	94.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.095	-1/-1	164006	38		Target = 1.47	0.10	1000.00	996.40		M
570 > 483	58	4.077	4.095		121734	37	>100:1	1.34 (0.73-2.21)	0.19				M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.235	4.237	0	1060298	19	>100:1			5000.00	5904.12	93.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.237	0/0	195997	41	>100:1	Target = 1.78		1000.00	925.35		M
584 > 526	60	4.235	4.237		108003	34	>100:1	1.81 (0.89-2.67)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.227	0	766361	20	>100:1			1000.00	1025.45	101.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.237	0/0	604371	18	>100:1	Target = 9.77		1000.00	893.45		
563 > 169	52	4.235	4.237		60957	17	>100:1	9.91 (4.88-14.66)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.284	0	131969	15	>100:1			1000.00	759.11	91.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.301	4.293	1/1	130338	17	>100:1			1000.00	1096.83		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.302	0	56588	16	>100:1			1000.00	908.90	85.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.310	4.302	1/1	63616	16	>100:1	Target = 1.18		1000.00	1061.26		
512 > 219	57	4.310	4.302		55177	15	>100:1	1.15 (0.59-1.78)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.449	4.444	1	132073	21	>100:1			1000.00	833.63	94.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.457	0/-1	107196	26	>100:1			1000.00	970.15		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.465	0	53350	19	>100:1			1000.00	873.95	91.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.474	0/0	63782	22	>100:1	Target = 1.11		1000.00	1151.63		
526 > 219	59	4.473	4.474		52799	19	>100:1	1.20 (0.55-1.67)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.497	4.506	0	721445	18	>100:1			1000.00	931.85	104.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.505	4.498	1/1	610057	21	>100:1	Target = 7.48		1000.00	878.76		
613 > 169	38	4.497	4.498		76883	19	>100:1	7.93 (3.74-11.22)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.738	4.746	0/0	233933	21	>100:1	Target = 3.23		1000.00	764.48		
663 > 169	38	4.732	4.746		74369	24	>100:1	3.14 (1.61-4.85)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.957	4.958	0	660111	19	>100:1			1000.00	798.55	106.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.957	4.958	0/0	452191	18	64:1	Target = 8.62		1000.00	851.94		
713 > 169	42	4.957	4.958		48339	19	>100:1	9.35 (4.31-12.93)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.339	5.351	0	340223	20	>100:1			1000.00	666.72	88.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.348	5.351	0/0	544173	19	56:1	Target = 12.71		1000.00	1039.46		
813 > 269	40	5.348	5.351		38892	20	>100:1	13.99 (6.35-19.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.715	5.733	-1/-1	435344	36	51:1	Target = 113.87		1000.00	1057.99		
913 > 319	40	5.715	5.733		4672	36	>100:1	93.18 (56.93-170.81)					
*** 37 13C2_PFDA**													
515 > 470		3.923	3.926	0	773633	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.434	2.431	1	933752	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.204	0	955355	24	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.706	1	1068387	23	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.572	3.574	0	238709	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221039.d
Injection Date: 22-Jul-2021 20:31:57 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 23
Sample Info: CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	879.82	88	70 - 130
D 46 13C4_PFBA	997866	911701			91.4	50 - 150
D 50 13C5_PFPeA	1059542	956490			90.3	50 - 150
21 PFPeA			1000.00	889.27	88.9	70 - 130
D 44 13C3_PFBS	297147	291117			98	50 - 150
7 PFBS			884.00	787.58	89.1	70 - 130
1 4:2 FTS			934.00	836.90	89.6	70 - 130
D 63 13C2_4:2 FTS_2	210753	220013			104.4	50 - 150
D 49 13C5_PFHxA	864384	768931			89	50 - 150
15 PFHxA			1000.00	945.71	94.6	70 - 130
22 PFPeS			938.00	809.89	86.3	70 - 130
28 GenX			2000.00	2128.32	106.4	70 - 130
D 66 13C3_GenX	649017	629854			97	50 - 150
D 47 13C4_PFHpA	1037869	847280			81.6	50 - 150
13 PFHpA			1000.00	940.66	94.1	70 - 130
D 45 13C3_PFHxS	261903	226744			86.6	50 - 150
14 PFHxS			910.00	935.93	102.8	70 - 130
29 ADONA			942.00	921.54	97.8	70 - 130
D 64 13C2_6:2 FTS_2	179008	172625			96.4	50 - 150
2 6:2 FTS			948.00	912.08	96.2	70 - 130
20 PFOA			1000.00	904.50	90.5	70 - 130
D 53 13C8_PFOA	991369	837202			84.4	50 - 150
12 PFHpS			952.00	937.48	98.5	70 - 130
18 PFOS			928.00	781.74	84.2	70 - 130
D 54 13C8_PFOS	227393	220479			97	50 - 150
17 PFNA			1000.00	920.36	92	70 - 130
D 56 13C9_PFNA	954829	863368			90.4	50 - 150
30 9Cl-PF3ONS			932.00	804.99	86.4	70 - 130
D 55 13C8_PFOSA	391661	347236			88.7	50 - 150
19 PFOSA			1000.00	1061.00	106.1	70 - 130
16 PFNS			960.00	860.89	89.7	70 - 130
D 65 13C2_8:2 FTS_2	132148	138036			104.5	50 - 150
3 8:2 FTS			958.00	899.24	93.9	70 - 130
10 PFDA			1000.00	984.59	98.5	70 - 130
D 51 13C6_PFDA	824029	677724			82.2	50 - 150
6 N-MeFOSAA			1000.00	1043.86	104.4	70 - 130

Report Date: 25-Jul-2021 09:47:59 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221039.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	862293	839561			97.4	50 - 150
9 PFDS			964.00	940.82	97.6	70 - 130
D 52 13C7_PFUdA	741490	699789			94.4	50 - 150
5 N-EtFOSAA			1000.00	1041.65	104.2	70 - 130
25 PFUdA			1000.00	845.33	84.5	70 - 130
D 60 d5-EtFOSAA	830172	766861			92.4	50 - 150
D 61 d7-MeFOSE	145483	131537			90.4	50 - 150
32 MeFOSE			1000.00	1049.15	104.9	70 - 130
26 MeFOSA			1000.00	971.82	97.2	70 - 130
D 57 d3-MeFOSA	60705	50294			82.8	50 - 150
31 11Cl-PF3OUDS			942.00	787.75	83.6	70 - 130
D 62 d9-EtFOSE	135458	130563			96.4	50 - 150
11 PFDoA			1000.00	956.05	95.6	70 - 130
D 38 13C2_PFDoA	798101	710397			89	50 - 150
4 10:2 FTS			964.00	910.82	94.5	70 - 130
33 EtFOSE			1000.00	1022.81	102.3	70 - 130
D 59 d5-EtFOSA	51036	46157			90.4	50 - 150
27 EtFOSA			1000.00	1114.45	111.4	70 - 130
34 PFDOS			968.00	795.53	82.2	70 - 130
24 PFTrDA			1000.00	913.41	91.3	70 - 130
23 PFTeDA			1000.00	913.81	91.4	70 - 130
D 42 13C2_PFTeDA	864247	735149			85.1	50 - 150
35 PFHxDA			1000.00	937.23	93.7	70 - 130
D 40 13C2_PFHxDA	383301	382475			99.8	50 - 150
36 PFODA			1000.00	976.69	97.7	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221039.d
Injection Date: 22-Jul-2021 20:31:57 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 23
Sample Info: CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	911701	20	>100:1			1000.00	982.61	91.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.713	1.705	1/0	819040	20	>100:1			1000.00	879.82		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.055	1	956490	16	>100:1			1000.00	991.00	90.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.055	1/0	848121	15	>100:1			1000.00	889.27		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.118	2.107	1	291117	16	>100:1			1000.00	1023.53	98	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	1/0	315700	15	>100:1	Target = 3.65		884.00	787.58		
298.9 > 99	44	2.118	2.118		81138	15	>100:1	3.89 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.466	2.457	1/0	240787	19	>100:1	Target = 3.30		938.00	809.89		
349 > 99	44	2.466	2.457		74088	19	>100:1	3.25 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	1	220013	18	>100:1			5000.00	4792.20	104.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.379	2/1	64930	17	>100:1	Target = 1.50		934.00	836.90		
327 > 81	63	2.388	2.379		40728	17	>100:1	1.59 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.422	1	768931	19	>100:1			1000.00	908.45	89	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.432	2.422	1/0	696287	17	>100:1	Target = 16.42		1000.00	945.71		
313 > 119	49	2.423	2.422		44277	19	>100:1	15.72 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.553	2.544	1	629854	18	>100:1			5000.00	4434.40	97	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.545	2.544	1/0	214602	19	>100:1	Target = 0.77		2000.00	2128.32		
285 > 185	66	2.553	2.544		258155	17	>100:1	0.83 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.800	1	847280	18	>100:1			1000.00	954.34	81.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.800	1/0	706727	18	>100:1	Target = 3.14		1000.00	940.66		
363 > 169	47	2.809	2.800		212067	18	>100:1	3.33 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.818	1	226744	17	>100:1			1000.00	902.54	86.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.818	1/0	237748	26	>100:1	Target = 3.31	0.18	910.00	935.93		
399 > 99	45	2.827	2.818		71374	24	>100:1	3.33 (1.66-4.98)	0.08				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.844	1/0	1089842	19	>100:1	Target = 2.54		942.00	921.54		
377 > 85	45	2.845	2.844		424873	18	>100:1	2.56 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.196	3.183	1/0	205587	22	>100:1	Target = 3.57		952.00	937.48		
449 > 99	45	3.189	3.183		58618	22	>100:1	3.50 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.164	3.145	2	172625	20	>100:1			5000.00	4654.96	96.4	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.164	3.152	1/-1	62784	22	>100:1	Target = 1.48		948.00	912.08		
427 > 81	64	3.164	3.152		45654	19	>100:1	1.37 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.189	3.177	1	837202	22	>100:1			1000.00	980.22	84.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.189	3.177	1/0	738200	22	>100:1	Target = 2.75		1000.00	904.50		
413 > 169	53	3.189	3.177		273670	24	>100:1	2.69 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.557	3.537	2	220479	20	>100:1			1000.00	1033.06	97	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.557	3.537	2/0	188814	39	>100:1	Target = 3.90	0.25	928.00	781.74		
499 > 99	54	3.557	3.537		54077	35	>100:1	3.49 (1.95-5.85)	0.14				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.761	3.742	2/0	492142	20	>100:1			932.00	804.99		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.885	3.871	1/-1	165261	18	>100:1	Target = 3.46		960.00	860.89		
549 > 99	54	3.885	3.871		42118	17	>100:1	3.92 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.175	4.159	1/-1	192411	16	>100:1	Target = 3.36		964.00	940.82		
599 > 99	54	4.184	4.159		56293	15		3.41 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.338	4.320	2/0	431090	15	>100:1			942.00	787.75		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.670	4.646	2/0	151159	17	>100:1	Target = 3.51		968.00	795.53		
699 > 99	54	4.670	4.646		45200	16	>100:1	3.34 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.557	3.544	1	863368	20	>100:1			1000.00	975.47	90.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.564	3.544	2/1	674234	20	>100:1	Target = 4.84		1000.00	920.36		
463 > 169	56	3.564	3.544		145232	20	>100:1	4.64 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.870	3.848	2	347236	18	>100:1			1000.00	866.08	88.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.870	3.856	1/-1	364134	17	>100:1	Target = 42.34		1000.00	1061.00		
498>478	55	3.870	3.856		9771	25		37.26 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.893	3.871	2	138036	20	>100:1			5000.00	4833.89	104.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.893	3.871	2/0	38450	18	>100:1	Target = 1.37		958.00	899.24		
527 > 81	65	3.893	3.871		26256	16	>100:1	1.46 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.473	4.449	2/0	53894	18	>100:1	Target = 2.23		964.00	910.82		
627 > 80	65	4.465	4.449		27173	22	>100:1	1.98 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.893	3.878	1	677724	17	>100:1			1000.00	942.88	82.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.901	3.878	2/1	605664	18	>100:1	Target = 11.16		1000.00	984.59		
513 > 169	51	3.893	3.878		55061	16	>100:1	10.99 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.049	4.030	2	839561	16	>100:1			5000.00	4689.32	97.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.049	4.030	2/0	129134	30	>100:1	Target = 1.39	0.09	1000.00	1043.86		M
570 > 483	58	4.049	4.030		85580	32	>100:1	1.50 (0.69-2.09)	0.13				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.200	4.176	2	699789	17	>100:1			1000.00	1040.56	94.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.200	4.184	1/-1	531420	17	>100:1	Target = 10.79		1000.00	845.33		
563 > 169	52	4.200	4.184		60099	17	>100:1	8.84 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.200	4.184	1	766861	18	>100:1			5000.00	4735.37	92.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.208	4.184	2/1	153217	32	>100:1	Target = 1.79		1000.00	1041.65		M
584 > 526	60	4.208	4.184		83814	32	>100:1	1.82 (0.89-2.69)	0.21				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.283	1	131537	16	>100:1			1000.00	876.51	90.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.301	4.292	1/0	131086	14	>100:1			1000.00	1049.15		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.310	4.301	1	50294	20	>100:1			1000.00	845.59	82.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.310	4.301	1/0	49565	14	80:1	Target = 1.04		1000.00	971.82		
512 > 219	57	4.310	4.301		50756	15	>100:1	0.97 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.457	4.443	1	710397	19	>100:1			1000.00	979.73	89	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.457	4.443	1/0	648306	17	>100:1	Target = 7.82		1000.00	956.05		
613 > 169	38	4.457	4.443		84705	19	>100:1	7.65 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.693	4.677	1/0	258432	17	>100:1	Target = 3.35		1000.00	913.41		
663 > 169	38	4.693	4.677		80956	18	>100:1	3.19 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.457	4.443	1	130563	16	>100:1			1000.00	910.73	96.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.465	4.456	1/0	108765	16	>100:1			1000.00	1022.81		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.473	4.464	1	46157	16	>100:1			1000.00	803.52	90.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.481	4.473	1/0	54009	14	>100:1	Target = 1.06		1000.00	1114.45		
526 > 219	59	4.481	4.473		45107	17	>100:1	1.19 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.907	4.889	2	735149	18	>100:1			1000.00	929.61	85.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.907	4.889	2/0	546222	18	>100:1	Target = 9.29		1000.00	913.81		
713 > 169	42	4.907	4.889		60068	14	>100:1	9.09 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.271	5.253	2	382475	16	>100:1			1000.00	939.16	99.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.279	5.253	2/0	576342	18	66:1	Target = 13.38		1000.00	937.23		
813 > 269	40	5.279	5.253		44148	15	>100:1	13.05 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.614	5.584	2/0	443694	22	73:1	Target = 106.35		1000.00	976.69		
913 > 319	40	5.614	5.584		4044	18	>100:1	109.71 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.901	3.878	2	719423	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.432	2.422	1	718118	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.189	3.171	2	783348	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.713	1.705	1	869328	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.557	3.537	2	204549	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

TETRA TECH

INTERNAL CORRESPONDENCE

TO: D. WILSON **DATE:** SEPTEMBER 13, 2021

FROM: GLORIA SCHIFINO **COPIES:** DV FILE

SUBJECT: **ORGANIC DATA VALIDATION – PER & POLYFLUOROALKYL SUBSTANCES (PFAS),**
NASA AMES
SAMPLE DELIVERY GROUP (SDG) WG20002

SAMPLES:

28/ Soil

AOPC1-SB01-0-0.5	AOPC1-SB01-0.5-2	AOPC1-SB02-0-0.5
AOPC1-SB02-0.5-2	AOPC1-SB03-0-0.5	AOPC1-SB03-0.5-2
AOPC1-SB04-0-0.5	AOPC1-SB04-0.5-2	AOPC2-SB01-0-0.5
AOPC2-SB01-0.5-2	AOPC2-SB02-0-0.5	AOPC2-SB02-0.5-2
AOPC2-SB03-0-0.5	AOPC2-SB03-0.5-2	AOPC2-SB04-0-0.5
AOPC2-SB04-0.5-2	AOPC2-SB05-0-0.5	AOPC2-SB05-0.5-2
AOPC2-SB06-0-0.5	AOPC2-SB06-0.5-2	AOPC2-SB07-0-0.5
AOPC2-SB07-0.5-2	AOPC6-SB01-0-0.5	AOPC6-SB01-0.5-2
AOPC7-SB01-0-0.5	AOPC7-SB01-0.5-2	AOPC7-SB02-0-0.5
AOPC7-SB02-0.5-2		

1/ Aqueous Sample

ERB-071321-S

Overview

The sample set for NASA Ames, SDG WG20002 consisted of twenty-eight (28) soil samples and one aqueous sample. All samples were analyzed for PFAS.

The samples were collected by Tetra Tech, Inc. on July 13, 2021 and analyzed by Pace Analytical. The analyses were conducted in compliance with Department of Defense (DoD)/Department of Energy (DOE) for Environmental Laboratories version 5.3 PFAS using LC/MS/MS (February 2018). The data contained in this SDG was validated via Stage 2B:

* • Data completeness
* • Hold times/Sample Preservation
* • Mass Calibration
* • LC/MS/MS System Tuning and Performance
* • Mass Spectral Acquisition Rate
* • Instrument Sensitivity Check
* • Ion Transition Check
* • Initial/Continuing Calibrations
• Laboratory Method/Preparation and Field Blank Results
* • Field Reagent Blank Results
• Extraction Internal Standard Recoveries

* • Injection Internal Standard Recoveries
* • Laboratory Control Sample Recoveries
* • Field Duplicate Precision
* • Compound Identification
* • Compound Quantitation
• Matrix spike/matrix spike duplicate recoveries

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, and documentation supporting these findings is presented in Appendix C.

PFAS

The matrix spike percent recovery 8:2FTS was poor (<10%) in sample AOPC2-SB03-0.5-2. The nondetected result was qualified (UX).

The matrix spike / matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) for 6:2FTS were outside the quality control limits for sample AOPC2-SB03-0-0.5. The nondetected results were qualified as (UJ).

The MS/MSD percent recovery and relative percent differences (RPD) PFOS outside the quality control limit for sample AOPC2-SB03-0-0.5. The detected results were qualified as (J).

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

Additional Comments

The following labeled extraction internal standard recovery 8:2 FTS was >150% quality control limit for sample AOPC1-SB02-0.0.5. No action was required because the aforementioned compound was nondetected.

The matrix spike / matrix spike duplicate (MS/MSD) percent recoveries PFNS and PFTeDA were >150% quality control limits for sample AOPC1-SB03-0.5-2. No validation because the sample results were nondetected.

Samples AOPC1-SB03-0-0.5, AOPC1-SB03-0.5-2, AOPC6-SB01-0.5-2, AOPC7-SB02-0-0.5 and AOPC7-SB02-0.5-2 were analyzed at a dilution 5x, 10x and 20x dilutions for PFOS.

Detected results reported below the LOQ but above the Detection Limit (DL) were qualified as estimated, (J).

Non-detected results were reported to the LOD.

Executive Summary

Laboratory Performance Issues:

Other Factors Affecting Data Quality: Detected results below the LOQ were estimated. A few matrix spike / matrix spike duplicate recoveries and relative percent differences (RPD) for PFOA, 8:2FTS and 6:2FTS were outside the quality control limits. The matrix spike 8:2FTS was not recovered in sample AOPC2-SB03-0.5-2

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled "Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis be QSM Table B15" (May 2020). The text of this report has been formulated to address only those areas affecting data quality.

Gloria Schifino

Tetra Tech, Inc.
Gloria Schifino
Chemist/Data Validator

Joseph A. Samchuck

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

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

Data Qualifier Definitions

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

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

Appendix A

Qualified Analytical Results

Qualifier Codes:

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

PROJ_NO: 09033A	NSAMPLE	AOPC1-SB01-0.5-2			AOPC1-SB01-0-0.5			AOPC1-SB02-0.5-2			AOPC1-SB02-0-0.5		
SDG: WG20002	LAB_ID	WG20002-006			WG20002-005			WG20002-008			WG20002-007		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	86.6			90.8			81.8			98.2		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		1	U		0.95	U		1.2	U		0.9	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		1	U		0.95	U		1.2	U		0.9	U	
4:2 FLUOROTELOMER SULFONATE		1	U		0.95	U		1.2	U		0.9	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		1	U		0.95	U		1.2	U		0.9	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		1	U		0.95	U		1.2	U		0.9	U	
9CL-PF3ONS		1	U		0.95	U		1.2	U		0.9	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		2	U		1.9	U		2.4	U		1.8	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		1	U		0.95	U		1.2	U		0.9	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		1	U		0.95	U		1.2	U		0.9	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		30			7			7.1			0.29	J	P
PERFLUOROBUTANESULFONIC ACID (PFBS)		0.31	J	P	0.19	J	P	0.6	U		0.46	U	
PERFLUOROBUTANOIC ACID (PFBA)		0.59	J	P	0.48	J	P	0.47	J	P	0.46	U	
PERFLUORODECANESULFONIC ACID (PFDS)		0.49	U		0.47	U		0.6	U		0.46	U	
PERFLUORODECANOIC ACID (PFDA)		0.49	U		0.81	J	P	0.6	U		0.46	U	
PERFLUORODODECANOIC ACID (PFDOA)		0.49	U		0.47	U		0.6	U		0.46	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.1			0.39	J	P	0.6	U		0.46	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		0.36	J	P	0.36	J	P	0.52	J	P	0.18	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		22			7.8			1.2			0.46	J	P
PERFLUOROHEXANOIC ACID (PFHXA)		1.1			1			0.82	J	P	0.27	J	P
PERFLUORONONANESULFONIC ACID (PFNS)		0.49	U		0.34	J	P	0.6	U		0.46	U	
PERFLUORONONANOIC ACID (PFNA)		0.71	J	P	0.29	J	P	0.6	U		0.46	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		0.49	U		1.4			0.6	U		0.46	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		40			61			2.5			11		
PERFLUOROPENTANESULFONIC ACID (PFPES)		0.54	J	P	0.24	J	P	0.6	U		0.46	U	

PROJ_NO: 09033A	NSAMPLE	AOPC1-SB03-0.5-2			AOPC1-SB03-0-0.5			AOPC1-SB04-0.5-2			AOPC1-SB04-0-0.5		
SDG: WG20002	LAB_ID	WG20002-010			WG20002-009			WG20002-012			WG20002-011		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	87.6			98.5			82.3			93.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		1.2	U		0.9	U		1.1	U		1	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		1.2	U		0.9	U		1.1	U		1	U	
4:2 FLUOROTELOMER SULFONATE		1.2	U		0.9	U		1.1	U		1	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		1.2	U		0.9	U		1.1	U		1	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		1.2	U		0.9	U		1.1	U		1	U	
9CL-PF3ONS		1.2	U		0.9	U		1.1	U		1	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		2.3	U		1.8	U		2.2	U		2	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		1.2	U		0.9	U		1.1	U		1	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		1.2	U		0.9	U		1.1	U		1	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		2.2			1.6			45			120		
PERFLUOROBUTANESULFONIC ACID (PFBS)		1.2			1.8			0.55	U		0.5	U	
PERFLUOROBUTANOIC ACID (PFBA)		0.49	J	P	0.51	J	P	1.1			0.36	J	P
PERFLUORODECANESULFONIC ACID (PFDS)		0.55	U		2.5			0.55	U		0.5	U	
PERFLUORODECANOIC ACID (PFDA)		0.55	U		0.45	U		0.55	U		0.54	J	P
PERFLUORODODECANOIC ACID (PFDOA)		0.55	U		0.45	U		0.55	U		0.25	J	P
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		3.8			0.77	J	P	0.55	U		0.21	J	P
PERFLUOROHEPTANOIC ACID (PFHPA)		0.3	J	P	0.24	J	P	0.56	J	P	1.6		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		42			26			5.5			5.8		
PERFLUOROHEXANOIC ACID (PFHXA)		4			3.6			1.9			3.1		
PERFLUORONONANESULFONIC ACID (PFNS)		0.55	U		3			0.55	U		0.5	U	
PERFLUORONONANOIC ACID (PFNA)		0.55	U		0.45	U		0.55	U		0.26	J	P
PERFLUOROOCTANE SULFONAMIDE (FOSA)		0.27	J	P	4.7			0.55	U		0.5	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		920			300			6.2			22		
PERFLUOROPENTANESULFONIC ACID (PFPES)		3.2			3			0.55	U		0.5	U	

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB01-0.5-2			AOPC2-SB01-0-0.5			AOPC2-SB02-0.5-2			AOPC2-SB02-0-0.5		
SDG: WG20002	LAB_ID	WG20002-016			WG20002-015			WG20002-018			WG20002-017		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.1			85.4			85.2			86.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		1.2	U		1.1	U		1.1	U		1.1	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		1.2	U		1.1	U		1.1	U		1.1	U	
4:2 FLUOROTELOMER SULFONATE		1.2	U		1.1	U		1.1	U		1.1	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		1.2	U		1.1	U		1.1	U		1.1	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		1.2	U		1.1	U		1.1	U		1.1	U	
9CL-PF3ONS		1.2	U		1.1	U		1.1	U		1.1	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		2.4	U		2.1	U		2.2	U		2.2	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		1.2	U		1.1	U		1.1	U		1.1	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		1.2	U		1.1	U		1.1	U		1.1	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		5.1			6.3			1.1			7.7		
PERFLUOROBUTANESULFONIC ACID (PFBS)		0.6	U		0.55	U		0.55	U		0.23	J	P
PERFLUOROBUTANOIC ACID (PFBA)		0.66	J	P	1.3			1.6			1.5		
PERFLUORODECANESULFONIC ACID (PFDS)		0.6	U		0.55	U		0.55	U		0.55	U	
PERFLUORODECANOIC ACID (PFDA)		0.6	U		0.55	U		0.55	U		0.29	J	P
PERFLUORODODECANOIC ACID (PFDOA)		0.6	U		0.55	U		0.55	U		0.55	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		0.36	J	P	0.6	J	P	0.55	U		0.44	J	P
PERFLUOROHEPTANOIC ACID (PFHPA)		0.6	U		0.6	J	P	0.55	U		1.4		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		10			14			2.6			6.5		
PERFLUOROHEXANOIC ACID (PFHXA)		1.2			1.3			0.81	J	P	2		
PERFLUORONONANESULFONIC ACID (PFNS)		0.6	U		0.55	U		0.55	U		0.55	U	
PERFLUORONONANOIC ACID (PFNA)		0.6	U		0.67	J	P	0.55	U		1.1		
PERFLUOROOCTANE SULFONAMIDE (FOSA)		0.6	U		0.54	J	P	0.55	U		0.55	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		12			41			0.55	U		19		
PERFLUOROPENTANESULFONIC ACID (PFPES)		0.6	U		0.28	J	P	0.55	U		0.55	U	

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB03-0.5-2			AOPC2-SB03-0-0.5			AOPC2-SB04-0.5-2			AOPC2-SB04-0-0.5		
SDG: WG20002	LAB_ID	WG20002-020			WG20002-019			WG20002-022			WG20002-021		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	82.2			80.0			85.5			78.8		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		1.2	U		1.3	U		1.2	U		1.2	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		1.2	U		1.3	U		1.2	U		1.2	U	
4:2 FLUOROTELOMER SULFONATE		1.2	U		1.3	U		1.2	U		1.2	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		1.2	U		1.3	UJ	D	1.2	U		1.2	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		1.2	UX	D	1.3	U		1.2	U		1.2	U	
9CL-PF3ONS		1.2	U		1.3	U		1.2	U		1.2	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		2.4	U		2.5	U		2.3	U		2.3	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		1.2	U		1.3	U		1.2	U		1.2	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		1.2	U		1.3	U		1.2	U		1.2	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		0.6	U		1.8			0.55	U		4.2		
PERFLUOROBUTANESULFONIC ACID (PFBS)		0.6	U		0.6	U		0.55	U		0.54	J	P
PERFLUOROBUTANOIC ACID (PFBA)		0.6	U		1.1	J	P	2.2			4.4		
PERFLUORODECANESULFONIC ACID (PFDS)		0.6	U		0.6	U		0.55	U		0.55	U	
PERFLUORODECANOIC ACID (PFDA)		0.6	U		0.6	U		0.55	U		0.55	U	
PERFLUORODODECANOIC ACID (PFDOA)		0.6	U		0.6	U		0.55	U		0.55	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		0.6	U		0.6	U		0.55	U		0.55	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		0.6	U		0.45	J	P	0.55	U		0.76	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		0.6	U		1.2			1.3			3.8		
PERFLUOROHEXANOIC ACID (PFHXA)		0.6	U		0.86	J	P	0.28	J	P	2.2		
PERFLUORONONANESULFONIC ACID (PFNS)		0.6	U		0.6	U		0.55	U		0.55	U	
PERFLUORONONANOIC ACID (PFNA)		0.6	U		0.25	J	P	0.55	U		0.25	J	P
PERFLUOROOCTANE SULFONAMIDE (FOSA)		0.6	U		0.6	U		0.55	U		0.55	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		0.6	U		4.2	J	D	0.55	U		6.7		
PERFLUOROPENTANESULFONIC ACID (PFPES)		0.6	U		0.6	U		0.55	U		0.55	U	

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB05-0.5-2			AOPC2-SB05-0-0.5			AOPC2-SB06-0.5-2			AOPC2-SB06-0-0.5		
SDG: WG20002	LAB_ID	WG20002-024			WG20002-023			WG20002-026			WG20002-025		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	82.8			89.0			84.3			91.4		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		1.1	U		1.1	U		1.2	U		1.1	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		1.1	U		1.1	U		1.2	U		1.1	U	
4:2 FLUOROTELOMER SULFONATE		1.1	U		1.1	U		1.2	U		1.1	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		1.1	U		1.1	U		1.2	U		1.1	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		1.1	U		1.1	U		1.2	U		1.1	U	
9CL-PF3ONS		1.1	U		1.1	U		1.2	U		1.1	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		2.1	U		2.2	U		2.3	U		2.1	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		1.1	U		1.1	U		1.2	U		1.1	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		1.1	U		1.1	U		1.2	U		1.1	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		3.3			0.64	J	P	0.26	J	P	3.5		
PERFLUOROBUTANESULFONIC ACID (PFBS)		0.5	U		0.55	U		0.55	U		0.55	U	
PERFLUOROBUTANOIC ACID (PFBA)		0.86	J	P	0.34	J	P	0.89	J	P	0.59	J	P
PERFLUORODECANESULFONIC ACID (PFDS)		0.5	U		0.55	U		0.55	U		0.55	U	
PERFLUORODECANOIC ACID (PFDA)		0.5	U		0.55	U		0.55	U		0.55	U	
PERFLUORODODECANOIC ACID (PFDOA)		0.5	U		0.55	U		0.55	U		0.55	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		0.41	J	P	0.55	U		0.55	U		0.55	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		0.63	J	P	0.31	J	P	0.55	U		1.1		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		14			2.8			0.55	U		1.5		
PERFLUOROHEXANOIC ACID (PFHXA)		1.2			0.71	J	P	0.55	U		1	J	P
PERFLUORONONANESULFONIC ACID (PFNS)		0.5	U		0.55	U		0.55	U		0.55	U	
PERFLUORONONANOIC ACID (PFNA)		0.39	J	P	0.58	J	P	0.55	U		0.72	J	P
PERFLUOROOCTANE SULFONAMIDE (FOSA)		0.27	J	P	0.31	J	P	0.55	U		0.55	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		21			14			0.55	U		9.6		
PERFLUOROPENTANESULFONIC ACID (PFPES)		0.31	J	P	0.55	U		0.55	U		0.55	U	

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB07-0.5-2			AOPC2-SB07-0-0.5			AOPC6-SB01-0.5-2			AOPC6-SB01-0-0.5		
SDG: WG20002	LAB_ID	WG20002-028			WG20002-027			WG20002-014			WG20002-013		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	85.4			80.8			77.2			98.1		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		1	U		1.2	U		1.3	U		0.85	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		1	U		1.2	U		1.3	U		0.85	U	
4:2 FLUOROTELOMER SULFONATE		1	U		1.2	U		1.3	U		0.85	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		1	U		1.2	U		1.3	U		0.85	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		1	U		1.2	U		1.3	U		0.81	J	P
9CL-PF3ONS		1	U		1.2	U		1.3	U		0.85	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		2	U		2.4	U		2.6	U		1.8	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		1	U		1.2	U		1.3	U		1.1	J	P
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		1	U		1.2	U		1.3	U		0.85	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		0.49	U		2.4			5.1			0.45	J	P
PERFLUOROBUTANESULFONIC ACID (PFBS)		0.49	U		0.6	U		0.29	J	P	0.36	J	P
PERFLUOROBUTANOIC ACID (PFBA)		1.2			1.1	J	P	0.58	J	P	0.43	U	
PERFLUORODECANESULFONIC ACID (PFDS)		0.49	U		0.6	U		0.65	U		0.42	J	P
PERFLUORODECANOIC ACID (PFDA)		0.49	U		0.6	U		0.65	U		1.2		
PERFLUORODODECANOIC ACID (PFDOA)		0.49	U		0.6	U		0.65	U		0.94		
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		0.49	U		0.6	U		25			0.44	J	P
PERFLUOROHEPTANOIC ACID (PFHPA)		0.23	J	P	0.61	J	P	0.47	J	P	0.43	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		0.49	U		0.68	J	P	92			12		
PERFLUOROHEXANOIC ACID (PFHXA)		0.3	J	P	0.67	J	P	4.1			1.1		
PERFLUORONONANESULFONIC ACID (PFNS)		0.49	U		0.6	U		0.65	U		0.33	J	P
PERFLUORONONANOIC ACID (PFNA)		0.49	U		0.6	U		0.43	J	P	0.43	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		0.49	U		0.6	U		0.65	U		0.43	J	P
PERFLUOROOCTANESULFONIC ACID (PFOS)		0.49	U		4.9			1900			120		
PERFLUOROPENTANESULFONIC ACID (PFPES)		0.49	U		0.6	U		0.94	J	P	0.58	J	P

PROJ_NO: 09033A	NSAMPLE	AOPC7-SB01-0.5-2			AOPC7-SB01-0-0.5			AOPC7-SB02-0.5-2			AOPC7-SB02-0-0.5		
SDG: WG20002	LAB_ID	WG20002-002			WG20002-001			WG20002-004			WG20002-003		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	92.5			78.5			83.5			76.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		0.95	U		1.2	U		1.1	U		1.2	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		0.95	U		1.2	U		1.1	U		1.2	U	
4:2 FLUOROTELOMER SULFONATE		0.95	U		1.2	U		1.1	U		1.2	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		0.95	U		1.2	U		1.1	U		1.3	J	P
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		0.95	U		1.2	U		0.73	J	P	0.78	J	P
9CL-PF3ONS		0.95	U		1.2	U		1.1	U		1.2	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		1.9	U		2.3	U		2.2	U		2.5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		0.95	U		1.2	U		1.1	U		1.2	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		0.95	U		1.2	U		1.1	U		1.2	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.1			1.4			4.2			3		
PERFLUOROBUTANESULFONIC ACID (PFBS)		0.48	U		0.55	U		0.41	J	P	0.55	J	P
PERFLUOROBUTANOIC ACID (PFBA)		0.47	J	P	0.5	J	P	0.92	J	P	3.8		
PERFLUORODECANESULFONIC ACID (PFDS)		0.48	U		0.56	J	P	2.4			5.1		
PERFLUORODECANOIC ACID (PFDA)		0.47	J	P	0.27	J	P	2.4			0.95	J	P
PERFLUORODODECANOIC ACID (PFDOA)		0.48	U		0.55	U		0.55	U		0.6	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		0.39	J	P	0.39	J	P	3			1.4		
PERFLUOROHEPTANOIC ACID (PFHPA)		0.6	J	P	0.58	J	P	2.4			11		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		4.8			5.6			21			23		
PERFLUOROHEXANOIC ACID (PFHXA)		0.81	J	P	0.87	J	P	4.8			12		
PERFLUORONONANESULFONIC ACID (PFNS)		0.32	J	P	0.97	J	P	4.4			4.2		
PERFLUORONONANOIC ACID (PFNA)		0.72	J	P	0.39	J	P	2.6			2		
PERFLUOROOCTANE SULFONAMIDE (FOSA)		0.55	J	P	0.62	J	P	24			4.6		
PERFLUOROOCTANESULFONIC ACID (PFOS)		140			110			1500			300		
PERFLUOROPENTANESULFONIC ACID (PFPES)		0.34	J	P	0.35	J	P	0.7	J	P	1.4		

PROJ_NO: 09033A	NSAMPLE	AOPC1-SB01-0.5-2			AOPC1-SB01-0-0.5			AOPC1-SB02-0.5-2			AOPC1-SB02-0-0.5		
SDG: WG20002	LAB_ID	WG20002-006			WG20002-005			WG20002-008			WG20002-007		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	86.6			90.8			81.8			98.2		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		0.8	J	P	0.43	J	P	0.85	J	P	0.44	J	P
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.49	U		0.47	U		0.6	U		0.46	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.49	U		0.47	U		0.6	U		0.46	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		0.49	U		0.25	J	P	0.6	U		0.46	U	

PROJ_NO: 09033A	NSAMPLE	AOPC1-SB03-0.5-2			AOPC1-SB03-0-0.5			AOPC1-SB04-0.5-2			AOPC1-SB04-0-0.5		
SDG: WG20002	LAB_ID	WG20002-010			WG20002-009			WG20002-012			WG20002-011		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	87.6			98.5			82.3			93.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1	J	P	0.76	J	P	1.9			1		
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.55	U		0.45	U		0.55	U		0.5	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.55	U		0.45	U		0.55	U		0.5	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		0.55	U		0.45	U		0.55	U		0.5	U	

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB01-0.5-2			AOPC2-SB01-0-0.5			AOPC2-SB02-0.5-2			AOPC2-SB02-0-0.5		
SDG: WG20002	LAB_ID	WG20002-016			WG20002-015			WG20002-018			WG20002-017		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.1			85.4			85.2			86.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		0.62	J	P	0.65	J	P	0.29	J	P	1.1		
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.6	U		0.55	U		0.55	U		0.55	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.6	U		0.55	U		0.55	U		0.55	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		0.6	U		0.55	U		0.55	U		0.55	U	

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB03-0.5-2			AOPC2-SB03-0-0.5			AOPC2-SB04-0.5-2			AOPC2-SB04-0-0.5		
SDG: WG20002	LAB_ID	WG20002-020			WG20002-019			WG20002-022			WG20002-021		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	82.2			80.0			85.5			78.8		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		0.6	U		0.65	J	P	0.55	U		1.5		
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.6	U		0.6	U		0.55	U		0.55	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.6	U		0.6	U		0.55	U		0.55	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		0.6	U		0.6	U		0.55	U		0.55	U	

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB05-0.5-2			AOPC2-SB05-0-0.5			AOPC2-SB06-0.5-2			AOPC2-SB06-0-0.5		
SDG: WG20002	LAB_ID	WG20002-024			WG20002-023			WG20002-026			WG20002-025		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	82.8			89.0			84.3			91.4		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		0.69	J	P	0.28	J	P	0.55	U		0.63	J	P
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.5	U		0.55	U		0.55	U		0.55	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.5	U		0.55	U		0.55	U		0.55	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		0.5	U		0.55	U		0.55	U		0.55	U	

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB07-0.5-2			AOPC2-SB07-0-0.5			AOPC6-SB01-0.5-2			AOPC6-SB01-0-0.5		
SDG: WG20002	LAB_ID	WG20002-028			WG20002-027			WG20002-014			WG20002-013		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	85.4			80.8			77.2			98.1		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		0.24	J	P	0.39	J	P	1.5			0.2	J	P
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.49	U		0.6	U		0.65	U		0.28	J	P
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.49	U		0.6	U		0.65	U		0.19	J	P
PERFLUOROUNDECANOIC ACID (PFUNA)		0.49	U		0.6	U		0.65	U		0.4	J	P

PROJ_NO: 09033A	NSAMPLE	AOPC7-SB01-0.5-2			AOPC7-SB01-0-0.5			AOPC7-SB02-0.5-2			AOPC7-SB02-0-0.5		
SDG: WG20002	LAB_ID	WG20002-002			WG20002-001			WG20002-004			WG20002-003		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	92.5			78.5			83.5			76.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.1			1.4			7.8			31		
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.48	U		0.55	U		0.55	U		0.6	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.48	U		0.55	U		0.55	U		0.6	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		0.26	J	P	0.63	J	P	0.52	J	P	1.4		

PROJ_NO: 09033A	NSAMPLE	AOPC1-SB01-0.5-2			AOPC1-SB01-0-0.5			AOPC1-SB02-0.5-2			AOPC1-SB02-0-0.5		
SDG: WG20002	LAB_ID	WG20002-006			WG20002-005			WG20002-008			WG20002-007		
FRACTION: MISC	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	%			%			%			%		
	PCT_SOLIDS	86.6			90.8			81.8			98.2		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
% SOLIDS		86.6			90.8			81.8			98.2		

PROJ_NO: 09033A	NSAMPLE	AOPC1-SB03-0.5-2			AOPC1-SB03-0-0.5			AOPC1-SB04-0.5-2			AOPC1-SB04-0-0.5		
SDG: WG20002	LAB_ID	WG20002-010			WG20002-009			WG20002-012			WG20002-011		
FRACTION: MISC	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	%			%			%			%		
	PCT_SOLIDS	87.6			98.5			82.3			93.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
% SOLIDS		87.6			98.5			82.3			93.9		

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB01-0.5-2			AOPC2-SB01-0-0.5			AOPC2-SB02-0.5-2			AOPC2-SB02-0-0.5		
SDG: WG20002	LAB_ID	WG20002-016			WG20002-015			WG20002-018			WG20002-017		
FRACTION: MISC	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	%			%			%			%		
	PCT_SOLIDS	84.1			85.4			85.2			86.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
% SOLIDS		84.1			85.4			85.2			86.9		

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB03-0.5-2			AOPC2-SB03-0-0.5			AOPC2-SB04-0.5-2			AOPC2-SB04-0-0.5		
SDG: WG20002	LAB_ID	WG20002-020			WG20002-019			WG20002-022			WG20002-021		
FRACTION: MISC	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	%			%			%			%		
	PCT_SOLIDS	82.2			80.0			85.5			78.8		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
% SOLIDS		82.2			80			85.5			78.8		

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB05-0.5-2			AOPC2-SB05-0-0.5			AOPC2-SB06-0.5-2			AOPC2-SB06-0-0.5		
SDG: WG20002	LAB_ID	WG20002-024			WG20002-023			WG20002-026			WG20002-025		
FRACTION: MISC	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	%			%			%			%		
	PCT_SOLIDS	82.8			89.0			84.3			91.4		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
% SOLIDS		82.8			89			84.3			91.4		

PROJ_NO: 09033A	NSAMPLE	AOPC2-SB07-0.5-2			AOPC2-SB07-0-0.5			AOPC6-SB01-0.5-2			AOPC6-SB01-0-0.5		
SDG: WG20002	LAB_ID	WG20002-028			WG20002-027			WG20002-014			WG20002-013		
FRACTION: MISC	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	%			%			%			%		
	PCT_SOLIDS	85.4			80.8			77.2			98.1		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
% SOLIDS		85.4			80.8			77.2			98.1		

PROJ_NO: 09033A	NSAMPLE	AOPC7-SB01-0.5-2			AOPC7-SB01-0-0.5			AOPC7-SB02-0.5-2			AOPC7-SB02-0-0.5		
SDG: WG20002	LAB_ID	WG20002-002			WG20002-001			WG20002-004			WG20002-003		
FRACTION: MISC	SAMP_DATE	7/13/2021			7/13/2021			7/13/2021			7/13/2021		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	%			%			%			%		
	PCT_SOLIDS	92.5			78.5			83.5			76.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
% SOLIDS		92.5			78.5			83.5			76		

PROJ_NO: 09033A	NSAMPLE	ERB-071321-S		
SDG: WG20002	LAB_ID	WG20002-029		
FRACTION: PFAS	SAMP_DATE	7/13/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
11CL-PF3OUDS		4	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		4	U	
4:2 FLUOROTELOMER SULFONATE		4	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		4	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		4	U	
9CL-PF3ONS		4	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		4	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		4	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		4	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		2	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		2	U	
PERFLUOROBUTANOIC ACID (PFBA)		2	U	
PERFLUORODECANESULFONIC ACID (PFDS)		2	U	
PERFLUORODECANOIC ACID (PFDA)		2	U	
PERFLUORODODECANOIC ACID (PFDOA)		2	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		2	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		2	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2	U	
PERFLUOROHEXANOIC ACID (PFHXA)		2	U	
PERFLUORONONANESULFONIC ACID (PFNS)		2	U	
PERFLUORONONANOIC ACID (PFNA)		2	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		2	U	

PROJ_NO: 09033A	NSAMPLE	ERB-071321-S		
SDG: WG20002	LAB_ID	WG20002-029		
FRACTION: PFAS	SAMP_DATE	7/13/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		2	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		2	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		2	U	

Appendix B

Results as Reported by the Laboratory

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-001
Description: AOPC7-SB01-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1000 | Project Name: NASA ARC PFAS | % Solids: 78.5 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1753	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.56	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.39	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.97	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.62	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.35	J	1.1	0.55	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.6		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.50	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.27	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.58	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.87	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.39	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.4		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.4		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.63	J	1.1	0.55	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	110		1.1	0.55	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		98	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		88	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-001
Description: AOPC7-SB01-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1000	Project Name: NASA ARC PFAS	% Solids: 78.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-002
Description: AOPC7-SB01-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1005 | Project Name: NASA ARC PFAS | % Solids: 92.5 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1825	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.95	U	1.9	0.95	0.48	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.48	U	0.96	0.48	0.19	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.48	U	0.96	0.48	0.19	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.39	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.32	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.34	J	0.96	0.48	0.19	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4.8		0.96	0.48	0.19	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.47	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.47	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.48	U	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.60	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.81	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.72	J	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.1		0.96	0.48	0.19	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1		0.96	0.48	0.19	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.48	U	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.48	U	0.96	0.48	0.19	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.26	J	0.96	0.48	0.19	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	140		0.96	0.48	0.19	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	50-150
13C2_6:2FTS		87	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		76	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-002
Description: AOPC7-SB01-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1005	Project Name: NASA ARC PFAS	% Solids: 92.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20002-003
Description: AOPC7-SB02-0-0.5
Matrix: Solid
Date Sampled: 07/13/2021 1030
Project Name: NASA ARC PFAS
% Solids: 76.0 07/20/2021 2309
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1835	JJG	07/25/2021 1645	99970
2	SOP SPE	PFAS by ID SOP QSM B-15	5	07/28/2021 1436	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.78	J	2.4	1.2	0.61	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.3	J	2.4	1.2	0.61	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.5	U	4.9	2.5	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.4	1.2	0.61	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	J	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	5.1		1.2	0.60	0.24	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.4		1.2	0.60	0.24	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	4.2		1.2	0.60	0.24	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	4.6		1.2	0.60	0.24	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.4		1.2	0.60	0.24	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	23		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.8		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.95	J	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	11		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	12		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.0		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	31		1.2	0.60	0.24	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.4		1.2	0.60	0.24	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	300		6.1	3.1	1.2	ug/kg	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		69	50-150		91	50-150
13C2_6:2FTS		82	50-150		96	50-150
13C2_8:2FTS		74	50-150		87	50-150
13C2_PFDoA		69	50-150		94	50-150
13C2_PFTeDA		72	50-150		91	50-150
13C3_PFBS		63	50-150		89	50-150
13C3_PFHxS		67	50-150		89	50-150
13C3-HFPO-DA		75	50-150		94	50-150
13C4_PFBA		66	50-150		88	50-150
13C4_PFHpA		71	50-150		90	50-150
13C5_PFHxA		70	50-150		86	50-150
13C5_PFPeA		66	50-150		91	50-150
13C6_PFDA		70	50-150		81	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-003
Description: AOPC7-SB02-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1030	Project Name: NASA ARC PFAS	% Solids: 76.0 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		75	50-150		98	50-150
13C8_PFOA		71	50-150		89	50-150
13C8_PFOS		61	50-150		96	50-150
13C8_PFOSA		78	50-150		97	50-150
13C9_PFNA		63	50-150		93	50-150
d5-EtFOSAA		79	50-150		97	50-150
d3-MeFOSAA		77	50-150		93	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20002-004
Description: AOPC7-SB02-0.5-2
Matrix: Solid
Date Sampled: 07/13/2021 1035
Project Name: NASA ARC PFAS
% Solids: 83.5 07/20/2021 2309
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1846	JJG	07/25/2021 1645	99970
2	SOP SPE	PFAS by ID SOP QSM B-15	20	07/28/2021 1446	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.73	J	2.2	1.1	0.54	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.41	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.4		1.1	0.55	0.22	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	3.0		1.1	0.55	0.22	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	4.4		1.1	0.55	0.22	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	24		1.1	0.55	0.22	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.70	J	1.1	0.55	0.22	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	21		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.92	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.4		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.4		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.8		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.6		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.2		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	7.8		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.52	J	1.1	0.55	0.22	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1500		22	11	4.3	ug/kg	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		83	50-150		90	50-150
13C2_6:2FTS		95	50-150		97	50-150
13C2_8:2FTS		89	50-150		94	50-150
13C2_PFDoA		77	50-150		88	50-150
13C2_PFTeDA		80	50-150		90	50-150
13C3_PFBS		79	50-150		91	50-150
13C3_PFHxS		87	50-150		93	50-150
13C3-HFPO-DA		87	50-150		97	50-150
13C4_PFBA		79	50-150		91	50-150
13C4_PFHpA		80	50-150		96	50-150
13C5_PFHxA		79	50-150		85	50-150
13C5_PFPeA		79	50-150		92	50-150
13C6_PFDA		86	50-150		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-004
Description: AOPC7-SB02-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1035	Project Name: NASA ARC PFAS	% Solids: 83.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		84	50-150		90	50-150
13C8_PFOA		84	50-150		98	50-150
13C8_PFOS		58	50-150		93	50-150
13C8_PFOSA		99	50-150		92	50-150
13C9_PFNA		60	50-150		96	50-150
d5-EtFOSAA		88	50-150		93	50-150
d3-MeFOSAA		87	50-150		99	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-005
Description: AOPC1-SB01-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1100 | Project Name: NASA ARC PFAS | % Solids: 90.8 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1856	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.95	U	1.9	0.95	0.47	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.19	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.47	U	0.94	0.47	0.19	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.39	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.34	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.4		0.94	0.47	0.19	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.24	J	0.94	0.47	0.19	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	7.8		0.94	0.47	0.19	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.48	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.81	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.47	U	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.36	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.0		0.94	0.47	0.19	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.29	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	7.0		0.94	0.47	0.19	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.43	J	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.47	U	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.47	U	0.94	0.47	0.19	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.25	J	0.94	0.47	0.19	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	61		0.94	0.47	0.19	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		80	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-005
Description: AOPC1-SB01-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1100	Project Name: NASA ARC PFAS	% Solids: 90.8 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-006
Description: AOPC1-SB01-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1105 | Project Name: NASA ARC PFAS | % Solids: 86.6 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1907	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.31	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.1		0.98	0.49	0.20	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.54	J	0.98	0.49	0.20	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	22		0.98	0.49	0.20	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.59	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.36	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.1		0.98	0.49	0.20	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.71	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	30		0.98	0.49	0.20	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.80	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	40		0.98	0.49	0.20	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		83	50-150
13C2_6:2FTS		91	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		77	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		79	50-150
13C6_PFDA		78	50-150
13C7_PFUdA		88	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-006
Description: AOPC1-SB01-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1105	Project Name: NASA ARC PFAS	% Solids: 86.6 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	50-150
13C8_PFOS		77	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-007
Description: AOPC1-SB02-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1120 | Project Name: NASA ARC PFAS | % Solids: 98.2 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1918	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.90	UQ	1.8	0.90	0.45	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.46	J	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.18	J	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.27	J	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.29	J	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.44	J	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.46	U	0.91	0.46	0.18	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	11		0.91	0.46	0.18	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		108	50-150
13C2_6:2FTS		135	50-150
13C2_8:2FTS	N	214	50-150
13C2_PFDoA		95	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		99	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-007
Description: AOPC1-SB02-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1120	Project Name: NASA ARC PFAS	% Solids: 98.2 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	50-150
13C8_PFOS		90	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		140	50-150
d3-MeFOSAA		142	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-008
Description: AOPC1-SB02-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1125 | Project Name: NASA ARC PFAS | % Solids: 81.8 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1928	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.2		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.47	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.52	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.82	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	7.1		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.85	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.5		1.2	0.60	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		78	50-150
13C2_6:2FTS		98	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		73	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		74	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		84	50-150
13C7_PFUdA		81	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-008
Description: AOPC1-SB02-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1125	Project Name: NASA ARC PFAS	% Solids: 81.8 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		75	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20002-009
Description: AOPC1-SB03-0-0.5
Matrix: Solid
Date Sampled: 07/13/2021 1140
Project Name: NASA ARC PFAS
% Solids: 98.5 07/20/2021 2309
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1939	JJG	07/25/2021 1645	99970
2	SOP SPE	PFAS by ID SOP QSM B-15	5	07/28/2021 1457	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.90	U	1.8	0.90	0.45	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8		0.89	0.45	0.18	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.5		0.89	0.45	0.18	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.77	J	0.89	0.45	0.18	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.0		0.89	0.45	0.18	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	4.7		0.89	0.45	0.18	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.0		0.89	0.45	0.18	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	26		0.89	0.45	0.18	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.51	J	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.24	J	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.6		0.89	0.45	0.18	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.6		0.89	0.45	0.18	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.76	J	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.45	U	0.89	0.45	0.18	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	300		4.5	2.3	0.89	ug/kg	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		84	50-150		92	50-150
13C2_6:2FTS		97	50-150		102	50-150
13C2_8:2FTS		98	50-150		90	50-150
13C2_PFDoA		86	50-150		85	50-150
13C2_PFTeDA		84	50-150		94	50-150
13C3_PFBS		73	50-150		91	50-150
13C3_PFHxS		81	50-150		91	50-150
13C3-HFPO-DA		84	50-150		94	50-150
13C4_PFBA		78	50-150		89	50-150
13C4_PFHpA		85	50-150		88	50-150
13C5_PFHxA		79	50-150		86	50-150
13C5_PFPeA		79	50-150		94	50-150
13C6_PFDA		81	50-150		87	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-009
Description: AOPC1-SB03-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1140	Project Name: NASA ARC PFAS	% Solids: 98.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		87	50-150		98	50-150
13C8_PFOA		79	50-150		93	50-150
13C8_PFOS		73	50-150		93	50-150
13C8_PFOSA		90	50-150		99	50-150
13C9_PFNA		73	50-150		95	50-150
d5-EtFOSAA		99	50-150		100	50-150
d3-MeFOSAA		91	50-150		94	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-010
Description: AOPC1-SB03-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1145 | Project Name: NASA ARC PFAS | % Solids: 87.6 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1950	JJG	07/25/2021 1645	99970
2	SOP SPE	PFAS by ID SOP QSM B-15	10	07/28/2021 1508	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.3	U	4.6	2.3	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.2		1.1	0.55	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	3.8		1.1	0.55	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.27	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.2		1.1	0.55	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	42		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.49	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.30	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.0		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.2		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.0	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	920		11	5.5	2.3	ug/kg	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		68	50-150		93	50-150
13C2_6:2FTS		74	50-150		97	50-150
13C2_8:2FTS		77	50-150		88	50-150
13C2_PFDoA		72	50-150		94	50-150
13C2_PFTeDA		75	50-150		92	50-150
13C3_PFBS		61	50-150		88	50-150
13C3_PFHxS		71	50-150		87	50-150
13C3-HFPO-DA		73	50-150		97	50-150
13C4_PFBA		68	50-150		91	50-150
13C4_PFHpA		77	50-150		92	50-150
13C5_PFHxA		67	50-150		83	50-150
13C5_PFPeA		71	50-150		95	50-150
13C6_PFDA		69	50-150		87	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-010
Description: AOPC1-SB03-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1145	Project Name: NASA ARC PFAS	% Solids: 87.6 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		81	50-150		91	50-150
13C8_PFOA		67	50-150		93	50-150
13C8_PFOS		59	50-150		92	50-150
13C8_PFOSA		82	50-150		96	50-150
13C9_PFNA		62	50-150		91	50-150
d5-EtFOSAA		74	50-150		98	50-150
d3-MeFOSAA		76	50-150		101	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-011
Description: AOPC1-SB04-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1200 | Project Name: NASA ARC PFAS | % Solids: 93.9 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2000	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.50	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.21	J	1.0	0.50	0.20	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.8		1.0	0.50	0.20	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.36	J	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.54	J	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.25	J	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.6		1.0	0.50	0.20	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.1		1.0	0.50	0.20	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.26	J	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	120		1.0	0.50	0.20	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.0		1.0	0.50	0.20	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.50	U	1.0	0.50	0.20	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	22		1.0	0.50	0.20	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		98	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		149	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		98	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-011
Description: AOPC1-SB04-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1200	Project Name: NASA ARC PFAS	% Solids: 93.9 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		116	50-150
d3-MeFOSAA		119	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-012
Description: AOPC1-SB04-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1205 | Project Name: NASA ARC PFAS | % Solids: 82.3 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2043	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.5		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.1		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.56	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	45		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	6.2		1.1	0.55	0.21	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		73	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		81	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-012
Description: AOPC1-SB04-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1205	Project Name: NASA ARC PFAS	% Solids: 82.3 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		80	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-013
Description: AOPC6-SB01-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1320 | Project Name: NASA ARC PFAS | % Solids: 98.1 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2054	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.81	J	1.7	0.85	0.43	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.86	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	J	1.7	0.85	0.43	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.85	U	1.7	0.85	0.43	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.36	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.42	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.44	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.33	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.43	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.58	J	0.86	0.43	0.17	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	12		0.86	0.43	0.17	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.43	U	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.2		0.86	0.43	0.17	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.94		0.86	0.43	0.17	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.43	U	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.1		0.86	0.43	0.17	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.43	U	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.45	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.20	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.28	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.19	J	0.86	0.43	0.17	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.40	J	0.86	0.43	0.17	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	120		0.86	0.43	0.17	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		81	50-150
13C2_6:2FTS		89	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		77	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-013
Description: AOPC6-SB01-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1320	Project Name: NASA ARC PFAS	% Solids: 98.1 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		110	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Description: AOPC6-SB01-0.5-2
Date Sampled: 07/13/2021 1325
Date Received: 07/20/2021
Project Name: NASA ARC PFAS
Project Number: 103IG667601
Laboratory ID: WG20002-014
Matrix: Solid
% Solids: 77.2 07/20/2021 2309

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2104	JJG	07/25/2021 1645	99970
2	SOP SPE	PFAS by ID SOP QSM B-15	20	07/28/2021 1539	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.3	U	2.6	1.3	0.64	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.29	J	1.3	0.65	0.26	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	25		1.3	0.65	0.26	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.94	J	1.3	0.65	0.26	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	92		1.3	0.65	0.26	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.58	J	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.47	J	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.1		1.3	0.65	0.26	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.43	J	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	5.1		1.3	0.65	0.26	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.5		1.3	0.65	0.26	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.65	U	1.3	0.65	0.26	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1900		26	13	5.1	ug/kg	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		91	50-150		96	50-150
13C2_6:2FTS		92	50-150		97	50-150
13C2_8:2FTS		89	50-150		93	50-150
13C2_PFDoA		88	50-150		89	50-150
13C2_PFTeDA		87	50-150		93	50-150
13C3_PFBS		86	50-150		88	50-150
13C3_PFHxS		84	50-150		97	50-150
13C3-HFPO-DA		92	50-150		99	50-150
13C4_PFBA		84	50-150		93	50-150
13C4_PFHpA		90	50-150		97	50-150
13C5_PFHxA		86	50-150		88	50-150
13C5_PFPeA		86	50-150		97	50-150
13C6_PFDA		82	50-150		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-014
Description: AOPC6-SB01-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1325	Project Name: NASA ARC PFAS	% Solids: 77.2 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		86	50-150		97	50-150
13C8_PFOA		86	50-150		97	50-150
13C8_PFOS		70	50-150		96	50-150
13C8_PFOSA		99	50-150		95	50-150
13C9_PFNA		68	50-150		94	50-150
d5-EtFOSAA		95	50-150		105	50-150
d3-MeFOSAA		91	50-150		100	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-015
Description: AOPC2-SB01-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1430 | Project Name: NASA ARC PFAS | % Solids: 85.4 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2115	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.60	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.54	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.28	J	1.1	0.55	0.21	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	14		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.3		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.60	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.3		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.67	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	6.3		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.65	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	41		1.1	0.55	0.21	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		70	50-150
13C2_6:2FTS		70	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		65	50-150
13C2_PFTeDA		66	50-150
13C3_PFBS		69	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		74	50-150
13C4_PFBA		65	50-150
13C4_PFHpA		69	50-150
13C5_PFHxA		67	50-150
13C5_PFPeA		66	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		75	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-015
Description: AOPC2-SB01-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1430	Project Name: NASA ARC PFAS	% Solids: 85.4 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		67	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		68	50-150
d5-EtFOSAA		68	50-150
d3-MeFOSAA		66	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-016
Description: AOPC2-SB01-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1435 | Project Name: NASA ARC PFAS | % Solids: 84.1 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2126	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.36	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	10		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.66	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.2		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	5.1		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.62	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	12		1.2	0.60	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	50-150
13C2_6:2FTS		95	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		94	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-016
Description: AOPC2-SB01-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1435	Project Name: NASA ARC PFAS	% Solids: 84.1 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		98	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-017
Description: AOPC2-SB02-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1445 | Project Name: NASA ARC PFAS | % Solids: 86.9 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2136	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.23	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.44	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	6.5		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.5		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.29	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.4		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.1		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	7.7		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	19		1.1	0.55	0.21	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	50-150
13C2_6:2FTS		91	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		77	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		73	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-017
Description: AOPC2-SB02-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1445	Project Name: NASA ARC PFAS	% Solids: 86.9 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		75	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		76	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20002-018
Description: AOPC2-SB02-0.5-2
Matrix: Solid
Date Sampled: 07/13/2021 1450
Project Name: NASA ARC PFAS
% Solids: 85.2 07/20/2021 2309
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2147	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.54	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.6		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.6		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.81	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.1		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.29	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		81	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		80	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		78	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-018
Description: AOPC2-SB02-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1450	Project Name: NASA ARC PFAS	% Solids: 85.2 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		77	50-150
d5-EtFOSAA		75	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-019
Description: AOPC2-SB03-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1500 | Project Name: NASA ARC PFAS | % Solids: 80.0 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2158	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.3	US	2.5	1.3	0.62	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.5	U	5.0	2.5	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.3	U	2.5	1.3	0.62	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.2		1.2	0.60	0.25	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.1	J	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.45	J	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.86	J	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.25	J	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8		1.2	0.60	0.25	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.65	J	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.25	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.2	S	1.2	0.60	0.25	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		88	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-019
Description: AOPC2-SB03-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1500	Project Name: NASA ARC PFAS	% Solids: 80.0 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		80	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		102	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-020
Description: AOPC2-SB03-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1505 | Project Name: NASA ARC PFAS | % Solids: 82.2 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2016	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	US	2.4	1.2	0.60	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	US	2.4	1.2	0.60	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.4	U	4.8	2.4	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.4	1.2	0.60	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.60	US	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	US	1.2	0.60	0.24	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.24	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	50-150
13C2_6:2FTS		86	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		85	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-020
Description: AOPC2-SB03-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1505	Project Name: NASA ARC PFAS	% Solids: 82.2 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	50-150
13C8_PFOS		92	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-021
Description: AOPC2-SB04-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1510 | Project Name: NASA ARC PFAS | % Solids: 78.8 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 2229	JJG	07/25/2021 1645	99970

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.54	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3.8		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.4		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.76	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.2		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.25	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.2		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.5		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	6.7		1.1	0.55	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		81	50-150
13C4_PFBA		73	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		75	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		77	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-021
Description: AOPC2-SB04-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1510	Project Name: NASA ARC PFAS	% Solids: 78.8 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	50-150
13C8_PFOS		87	50-150
13C8_PFOSA		93	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-022
Description: AOPC2-SB04-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1515 | Project Name: NASA ARC PFAS | % Solids: 85.5 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2048	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.3		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.2		1.1	0.55	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.28	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		90	50-150
13C2_6:2FTS		88	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		90	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		85	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-022
Description: AOPC2-SB04-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1515	Project Name: NASA ARC PFAS	% Solids: 85.5 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Description: AOPC2-SB05-0-0.5
Date Sampled: 07/13/2021 1520
Date Received: 07/20/2021
Project Name: NASA ARC PFAS
Project Number: 103IG667601
Laboratory ID: WG20002-023
Matrix: Solid
% Solids: 89.0 07/20/2021 2309

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2058	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.2	1.1	0.55	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.31	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.8		1.1	0.55	0.22	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.34	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.31	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.71	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.58	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.64	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.28	J	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.22	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	14		1.1	0.55	0.22	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		87	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-023
Description: AOPC2-SB05-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1520	Project Name: NASA ARC PFAS	% Solids: 89.0 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		92	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-024
Description: AOPC2-SB05-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1525 | Project Name: NASA ARC PFAS | % Solids: 82.8 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2109	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.52	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.41	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.27	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.31	J	1.0	0.50	0.21	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	14		1.0	0.50	0.21	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.86	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.63	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.2		1.0	0.50	0.21	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.39	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.3		1.0	0.50	0.21	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.69	J	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.50	U	1.0	0.50	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	21		1.0	0.50	0.21	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		83	50-150
13C2_6:2FTS		89	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-024
Description: AOPC2-SB05-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1525	Project Name: NASA ARC PFAS	% Solids: 82.8 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-025
Description: AOPC2-SB06-0-0.5 | Matrix: Solid
Date Sampled: 07/13/2021 1530 | Project Name: NASA ARC PFAS | % Solids: 91.4 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2120	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.1	U	2.1	1.1	0.53	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.5		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.59	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.1		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.0	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.72	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.5		1.1	0.55	0.21	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.63	J	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.21	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.6		1.1	0.55	0.21	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	50-150
13C2_6:2FTS		86	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		74	50-150
13C5_PFPeA		81	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		86	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-025
Description: AOPC2-SB06-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1530	Project Name: NASA ARC PFAS	% Solids: 91.4 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		72	50-150
d3-MeFOSAA		70	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20002-026
Description: AOPC2-SB06-0.5-2
Matrix: Solid
Date Sampled: 07/13/2021 1535
Project Name: NASA ARC PFAS
% Solids: 84.3 07/20/2021 2309
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2130	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.3	U	4.6	2.3	1.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.57	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.89	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.26	J	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.55	U	1.1	0.55	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	50-150
13C2_6:2FTS		88	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		82	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		77	50-150
13C3_PFHxS		76	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		75	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		77	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-026
Description: AOPC2-SB06-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1535	Project Name: NASA ARC PFAS	% Solids: 84.3 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20002-027
Description: AOPC2-SB07-0-0.5
Matrix: Solid
Date Sampled: 07/13/2021 1540
Project Name: NASA ARC PFAS
% Solids: 80.8 07/20/2021 2309
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2141	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.4	U	4.7	2.4	1.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.2	U	2.3	1.2	0.58	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.68	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.1	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.61	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.67	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.4		1.2	0.60	0.23	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.39	J	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.60	U	1.2	0.60	0.23	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.9		1.2	0.60	0.23	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		83	50-150
13C2_6:2FTS		88	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		82	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		84	50-150
13C6_PFDA		80	50-150
13C7_PFUdA		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-027
Description: AOPC2-SB07-0-0.5		Matrix: Solid
Date Sampled: 07/13/2021 1540	Project Name: NASA ARC PFAS	% Solids: 80.8 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20002-028
Description: AOPC2-SB07-0.5-2 | Matrix: Solid
Date Sampled: 07/13/2021 1545 | Project Name: NASA ARC PFAS | % Solids: 85.4 07/20/2021 2309
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2152	JJG	07/26/2021 2046	10065

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	1.0	U	2.0	1.0	0.49	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.2		0.98	0.49	0.20	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.23	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.30	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.24	J	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.49	U	0.98	0.49	0.20	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		80	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		78	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		80	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		85	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20002-028
Description: AOPC2-SB07-0.5-2		Matrix: Solid
Date Sampled: 07/13/2021 1545	Project Name: NASA ARC PFAS	% Solids: 85.4 07/20/2021 2309
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20002-029
Description: ERB-071321-S
Matrix: Aqueous
Date Sampled: 07/13/2021 1550
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1526	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		112	50-150
13C2_6:2FTS		128	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		107	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		102	50-150
13C3-HFPO-DA		107	50-150
13C4_PFBA		110	50-150
13C4_PFHpA		112	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		98	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20002-029
Description: ERB-071321-S			Matrix: Aqueous
Date Sampled: 07/13/2021 1550		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		118	50-150
13C8_PFOS		103	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		108	50-150
d5-EtFOSAA		108	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Appendix C

Support Documentation

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122961

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves		WG20002
Project Name: NASA ARC PFAS			KBS2
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G-Grab C-Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 kit	Field Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC7-SB01-0-0.5	7/13/21	1000	G		x		1							X	
AOPC7-SB01-0.5-2	7/13/21	1005	G		x		1							X	
AOPC7-SB02-0-0.5	7/13/21	1030	G		x		1							X	
AOPC7-SB02-0.5-2	7/13/21	1035	G		x		1							X	
AOPC1-SB01-0-0.5	7/13/21	1100	G		x		1							X	
AOPC1-SB01-0.5-2	7/13/21	1105	G		x		1							X	
AOPC1-SB02-0-0.5	7/13/21	1120	G		x		1							X	
AOPC1-SB02-0.5-2	7/13/21	1125	G		x		1							X	
AOPC1-SB03-0-0.5	7/13/21	1140	G		x		1							X	
AOPC1-SB03-0.5-2	7/13/21	1145	G		x		1							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves [signature] Tt	7/19/21	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	7/20/21	0955	4. Laboratory received by: [signature]	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on Ice (Circle) Yes No Ice Pack Receipt Temp 4.7 °C Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122963

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x Callie Neaves	Analysis (Attach list if more space is needed)	Page 2 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves		
Project Name: NASA ARC PFAS			
Project No.: 103IG667601; P.O. No.			

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	HCl	HNO3	H2SO4	NaOH	ZnAc/NaOH	Other	PFAS (Modified 537 Isotope Dilution)								Remarks / Cooler ID
AOPC1-SB04-0-0.5	7/13/21	1200	G		X		1							X								
AOPC1-SB04-0.5-2	7/13/21	1205	G		X		1							X								
AOPC6-SB01-0-0.5	7/13/21	1320	G		X		1							X								
AOPC6-SB01-0.5-2	7/13/21	1325	G		X		1							X								
AOPC2-SB01-0-0.5	7/13/21	1430	G		X		1							X								
AOPC2-SB01-0.5-2	7/13/21	1435	G		X		1							X								
AOPC2-SB02-0-0.5	7/13/21	1445	G		X		1							X								
AOPC2-SB02-0.5-2	7/13/21	1450	G		X		1							X								
AOPC2-SB03-0-0.5	7/13/21	1500	G		X		3							X								MS/MSD
AOPC2-SB03-0.5-2	7/13/21	1505	G		X		3							X								MS/MSD

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☐ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves	7/19/21	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	7/20/21	0955	4. Laboratory received by	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on Ice (Circle): (Yes) No; Ice Pack; Receipt Temp 4.7 °C; Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

WG20002

KES2

PACE ANALYTICAL SERVICES, LLC

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122955

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 3 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves		WG20002
Project Name: NASA ARC PFAS			
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Specific C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	NaOH/Zn	Field Filtered	PFAS (GLM B-15)	Remarks / Cooler I.D.
AOPC2-SB04-0-0.5	7/13/21	1510	G		X		1							X	
AOPC2-SB04-0.5-2	7/13/21	1515	G		X		1							X	
AOPC2-SB05-0-0.5	7/13/21	1520	G		X		1							X	
AOPC2-SB05-0.5-2	7/13/21	1525	G		X		1							X	
AOPC2-SB06-0-0.5	7/13/21	1530	G		X		1							X	
AOPC2-SB06-0.5-2	7/13/21	1535	G		X		1							X	
AOPC2-SB07-0-0.5	7/13/21	1540	G		X		1							X	
AOPC2-SB07-0.5-2	7/13/21	1545	G		X		1							X	
ERB-071321-S	7/13/21	1550	G	X			2							X	
~~EP~~ CN															

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	7/19/21	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	7/20/21	0955	4. Laboratory received by: [signature]	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 4.7 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PaceAnalytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCO

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: JRG2 / 07/20/2021 Lot #: WO20002

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: 21-1425

4.7 / 4.7 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JRG2 Date: 07/20/2021

Comments:

Case Narrative
Tetra Tech
Lot Number: WG20002

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

The continuing calibration verification (CCV) associated with sample WG20002-029 for analyte: 8:2 FTS recovered above the upper control limit. The sample(s) associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

Surrogate recovery for the following sample(s) was outside the upper control limit: WG20002-007. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

The MS/MSD associated with samples WG20002-019, WG20002-020 had multiple analytes recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample Summary
Tetra Tech
Lot Number: WG20002
Project Name: NASA ARC PFAS
Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC7-SB01-0-0.5	Solid	07/13/2021 1000	07/20/2021
002	AOPC7-SB01-0.5-2	Solid	07/13/2021 1005	07/20/2021
003	AOPC7-SB02-0-0.5	Solid	07/13/2021 1030	07/20/2021
004	AOPC7-SB02-0.5-2	Solid	07/13/2021 1035	07/20/2021
005	AOPC1-SB01-0-0.5	Solid	07/13/2021 1100	07/20/2021
006	AOPC1-SB01-0.5-2	Solid	07/13/2021 1105	07/20/2021
007	AOPC1-SB02-0-0.5	Solid	07/13/2021 1120	07/20/2021
008	AOPC1-SB02-0.5-2	Solid	07/13/2021 1125	07/20/2021
009	AOPC1-SB03-0-0.5	Solid	07/13/2021 1140	07/20/2021
010	AOPC1-SB03-0.5-2	Solid	07/13/2021 1145	07/20/2021
011	AOPC1-SB04-0-0.5	Solid	07/13/2021 1200	07/20/2021
012	AOPC1-SB04-0.5-2	Solid	07/13/2021 1205	07/20/2021
013	AOPC6-SB01-0-0.5	Solid	07/13/2021 1320	07/20/2021
014	AOPC6-SB01-0.5-2	Solid	07/13/2021 1325	07/20/2021
015	AOPC2-SB01-0-0.5	Solid	07/13/2021 1430	07/20/2021
016	AOPC2-SB01-0.5-2	Solid	07/13/2021 1435	07/20/2021
017	AOPC2-SB02-0-0.5	Solid	07/13/2021 1445	07/20/2021
018	AOPC2-SB02-0.5-2	Solid	07/13/2021 1450	07/20/2021
019	AOPC2-SB03-0-0.5	Solid	07/13/2021 1500	07/20/2021
020	AOPC2-SB03-0.5-2	Solid	07/13/2021 1505	07/20/2021
021	AOPC2-SB04-0-0.5	Solid	07/13/2021 1510	07/20/2021
022	AOPC2-SB04-0.5-2	Solid	07/13/2021 1515	07/20/2021
023	AOPC2-SB05-0-0.5	Solid	07/13/2021 1520	07/20/2021
024	AOPC2-SB05-0.5-2	Solid	07/13/2021 1525	07/20/2021
025	AOPC2-SB06-0-0.5	Solid	07/13/2021 1530	07/20/2021
026	AOPC2-SB06-0.5-2	Solid	07/13/2021 1535	07/20/2021
027	AOPC2-SB07-0-0.5	Solid	07/13/2021 1540	07/20/2021
028	AOPC2-SB07-0.5-2	Solid	07/13/2021 1545	07/20/2021
029	ERB-071321-S	Aqueous	07/13/2021 1550	07/20/2021

(29 samples)

PFAS by LC/MS/MS - MB

Sample ID: WQ10065-001
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
11Cl-PF3OUdS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
8:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
6:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
4:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
GenX	2.0	U	1	4.0	2.0	1.0	ug/kg	07/28/2021 1954
ADONA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
EtFOSAA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
MeFOSAA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/28/2021 1954
PFBS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFDS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFHpS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFNS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFOSA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFPeS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFHxS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFBA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFDoA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFHpA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFHxA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFNA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFOA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFPeA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFTeDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFTrDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFUdA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954
PFOS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/28/2021 1954

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		88	50-150
13C2_8:2FTS		84	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		75	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10065-001
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		80	50-150
13C7_PFUdA		83	50-150
13C8_PFOA		84	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10065-002
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	1.9	2.3		1	125	70-130	07/28/2021 2005
11Cl-PF3OUdS	1.9	2.3		1	121	70-130	07/28/2021 2005
8:2 FTS	1.9	2.0		1	106	65-137	07/28/2021 2005
6:2 FTS	1.9	1.7		1	88	64-140	07/28/2021 2005
4:2 FTS	1.9	2.0		1	106	62-145	07/28/2021 2005
GenX	4.0	4.6		1	114	70-150	07/28/2021 2005
ADONA	1.9	2.1		1	114	70-130	07/28/2021 2005
EtFOSAA	2.0	2.3		1	117	61-139	07/28/2021 2005
MeFOSAA	2.0	1.7		1	87	63-144	07/28/2021 2005
PFBS	1.8	1.9		1	111	72-128	07/28/2021 2005
PFDS	1.9	2.4		1	125	59-134	07/28/2021 2005
PFHpS	1.9	2.3		1	124	70-132	07/28/2021 2005
PFNS	1.9	2.4		1	124	69-125	07/28/2021 2005
PFOSA	2.0	2.0		1	102	67-137	07/28/2021 2005
PFPeS	1.9	2.3		1	122	73-123	07/28/2021 2005
PFHxS	1.8	2.0		1	108	67-130	07/28/2021 2005
PFBA	2.0	2.3		1	113	71-135	07/28/2021 2005
PFDA	2.0	2.3		1	114	69-133	07/28/2021 2005
PFDoA	2.0	2.2		1	112	69-135	07/28/2021 2005
PFHpA	2.0	2.2		1	112	71-131	07/28/2021 2005
PFHxA	2.0	2.2		1	111	70-132	07/28/2021 2005
PFNA	2.0	2.1		1	104	72-129	07/28/2021 2005
PFOA	2.0	2.4		1	121	69-133	07/28/2021 2005
PFPeA	2.0	2.2		1	109	69-132	07/28/2021 2005
PFTeDA	2.0	2.3		1	117	69-133	07/28/2021 2005
PFTrDA	2.0	2.6		1	132	66-139	07/28/2021 2005
PFUdA	2.0	2.3		1	113	64-136	07/28/2021 2005
PFOS	1.9	2.2		1	116	68-136	07/28/2021 2005

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		91	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10065-002
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		88	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20002-020MS
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	2.1	2.5		1	116	70-130	07/28/2021 2026
11Cl-PF3OUdS	ND	2.2	2.5		1	115	70-130	07/28/2021 2026
8:2 FTS	ND	2.3	ND	N	1	0.00	65-137	07/28/2021 2026
6:2 FTS	ND	2.2	1.8		1	85	64-140	07/28/2021 2026
4:2 FTS	ND	2.1	2.6		1	121	62-145	07/28/2021 2026
GenX	ND	4.6	4.7		1	103	70-130	07/28/2021 2026
ADONA	ND	2.2	2.3		1	107	70-130	07/28/2021 2026
EtFOSAA	ND	2.3	2.4		1	103	61-139	07/28/2021 2026
MeFOSAA	ND	2.3	2.7		1	116	63-144	07/28/2021 2026
PFBS	ND	2.0	2.6		1	127	72-128	07/28/2021 2026
PFDS	ND	2.2	2.1		1	95	59-134	07/28/2021 2026
PFHpS	ND	2.2	2.3		1	105	70-132	07/28/2021 2026
PFNS	ND	2.2	2.9	N	1	133	69-125	07/28/2021 2026
PFOSA	ND	2.3	2.6		1	113	67-137	07/28/2021 2026
PFPeS	ND	2.1	2.4		1	114	73-123	07/28/2021 2026
PFHxS	ND	2.1	2.5		1	118	67-130	07/28/2021 2026
PFBA	ND	2.3	2.9		1	128	71-135	07/28/2021 2026
PFDA	ND	2.3	2.5		1	111	69-133	07/28/2021 2026
PFDoA	ND	2.3	3.0		1	129	69-135	07/28/2021 2026
PFHpA	ND	2.3	2.5		1	111	71-131	07/28/2021 2026
PFHxA	ND	2.3	2.8		1	123	70-132	07/28/2021 2026
PFNA	ND	2.3	2.7		1	118	72-129	07/28/2021 2026
PFOA	ND	2.3	2.9		1	128	69-133	07/28/2021 2026
PFPeA	ND	2.3	2.7		1	117	69-132	07/28/2021 2026
PFTeDA	ND	2.3	2.5		1	109	69-133	07/28/2021 2026
PFTrDA	ND	2.3	3.3	N	1	144	66-139	07/28/2021 2026
PFUdA	ND	2.3	2.9		1	128	64-136	07/28/2021 2026
PFOS	ND	2.1	2.0		1	95	68-136	07/28/2021 2026

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		84	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20002-020MS
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		87	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20002-020MD
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	2.0	2.1		1	106	17	70-130	30	07/28/2021 2037
11Cl-PF3OUdS	ND	2.0	2.2		1	112	10	70-130	30	07/28/2021 2037
8:2 FTS	ND	2.0	2.2	+	1	107	200	65-137	30	07/28/2021 2037
6:2 FTS	ND	2.0	5.2	N,+	1	260	95	64-140	30	07/28/2021 2037
4:2 FTS	ND	2.0	2.5		1	128	2.8	62-145	30	07/28/2021 2037
GenX	ND	4.2	4.5		1	108	4.0	70-130	30	07/28/2021 2037
ADONA	ND	2.0	2.3		1	115	1.5	70-130	30	07/28/2021 2037
EtFOSAA	ND	2.1	2.3		1	107	4.9	61-139	30	07/28/2021 2037
MeFOSAA	ND	2.1	2.0		1	94	29	63-144	30	07/28/2021 2037
PFBS	ND	1.9	2.2		1	120	14	72-128	30	07/28/2021 2037
PFDS	ND	2.0	2.4		1	118	13	59-134	30	07/28/2021 2037
PFHpS	ND	2.0	2.6		1	131	14	70-132	30	07/28/2021 2037
PFNS	ND	2.0	2.5		1	124	16	69-125	30	07/28/2021 2037
PFOSA	ND	2.1	2.3		1	108	13	67-137	30	07/28/2021 2037
PFPeS	ND	2.0	2.3		1	117	4.5	73-123	30	07/28/2021 2037
PFHxS	ND	1.9	2.2		1	116	9.7	67-130	30	07/28/2021 2037
PFBA	ND	2.1	2.8		1	132	5.5	71-135	30	07/28/2021 2037
PFDA	ND	2.1	2.6		1	123	1.9	69-133	30	07/28/2021 2037
PFDoA	ND	2.1	2.5		1	119	17	69-135	30	07/28/2021 2037
PFHpA	ND	2.1	2.4		1	112	7.3	71-131	30	07/28/2021 2037
PFHxA	ND	2.1	2.5		1	118	12	70-132	30	07/28/2021 2037
PFNA	ND	2.1	2.5		1	117	8.6	72-129	30	07/28/2021 2037
PFOA	ND	2.1	2.6		1	123	12	69-133	30	07/28/2021 2037
PFPeA	ND	2.1	2.5		1	120	5.6	69-132	30	07/28/2021 2037
PFTeDA	ND	2.1	2.3		1	109	8.5	69-133	30	07/28/2021 2037
PFTrDA	ND	2.1	2.7		1	126	22	66-139	30	07/28/2021 2037
PFUdA	ND	2.1	2.5		1	118	17	64-136	30	07/28/2021 2037
PFOS	ND	2.0	2.2		1	110	7.0	68-136	30	07/28/2021 2037

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		82	50-150
13C2_6:2FTS		87	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA		90	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		80	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		75	50-150
13C5_PFPeA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20002-020MD
Batch: 10065
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/26/2021 2046

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		86	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		76	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99902-001
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		84	50-150
13C2_6:2FTS		79	50-150
13C2_8:2FTS		71	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		65	50-150
13C3_PFBS		71	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		75	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99902-001
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		76	50-150
13C7_PFUdA		67	50-150
13C8_PFOA		81	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		78	50-150
13C9_PFNA		77	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99902-002
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	107	70-150	07/25/2021 2318
11Cl-PF3OUdS	15	14		1	95	70-150	07/25/2021 2318
8:2 FTS	15	18		1	118	67-138	07/25/2021 2318
6:2 FTS	15	11		1	75	64-140	07/25/2021 2318
4:2 FTS	15	16		1	107	63-143	07/25/2021 2318
GenX	32	30		1	94	70-150	07/25/2021 2318
ADONA	15	16		1	104	70-150	07/25/2021 2318
EtFOSAA	16	15		1	96	61-135	07/25/2021 2318
MeFOSAA	16	15		1	93	65-136	07/25/2021 2318
PFBS	14	15		1	105	72-130	07/25/2021 2318
PFDS	15	19		1	121	53-142	07/25/2021 2318
PFHpS	15	16		1	104	69-134	07/25/2021 2318
PFNS	15	16		1	101	69-127	07/25/2021 2318
PFOSA	16	16		1	101	67-137	07/25/2021 2318
PFPeS	15	16		1	105	71-127	07/25/2021 2318
PFHxS	15	15		1	101	68-131	07/25/2021 2318
PFBA	16	17		1	105	73-129	07/25/2021 2318
PFDA	16	17		1	109	71-129	07/25/2021 2318
PFDoA	16	18		1	110	72-134	07/25/2021 2318
PFHpA	16	19		1	119	72-130	07/25/2021 2318
PFHxA	16	18		1	113	72-129	07/25/2021 2318
PFNA	16	17		1	105	69-130	07/25/2021 2318
PFOA	16	17		1	108	71-133	07/25/2021 2318
PFPeA	16	16		1	102	72-129	07/25/2021 2318
PFTeDA	16	16		1	102	71-132	07/25/2021 2318
PFTrDA	16	20		1	122	65-144	07/25/2021 2318
PFUdA	16	14		1	90	69-133	07/25/2021 2318
PFOS	15	14		1	94	65-140	07/25/2021 2318

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		89	50-150
13C2_8:2FTS		75	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		73	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99902-002
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	50-150
13C7_PFUdA		80	50-150
13C8_PFOA		87	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99970-001
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
11Cl-PF3OUdS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
8:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
6:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
4:2 FTS	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
GenX	2.0	U	1	4.0	2.0	1.0	ug/kg	07/27/2021 1502
ADONA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
EtFOSAA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
MeFOSAA	1.0	U	1	2.0	1.0	0.50	ug/kg	07/27/2021 1502
PFBS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFDS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFHpS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFNS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFOSA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFPeS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFHxS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFBA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFDoA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFHpA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFHxA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFNA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFOA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFPeA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFTeDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFTrDA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFUdA	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502
PFOS	0.50	U	1	1.0	0.50	0.20	ug/kg	07/27/2021 1502

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		85	50-150
13C2_6:2FTS		97	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		80	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99970-001
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		84	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99970-002
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	1.9	2.1		1	113	70-130	07/27/2021 1513
11Cl-PF3OUdS	1.9	1.8		1	96	70-130	07/27/2021 1513
8:2 FTS	1.9	2.3		1	122	65-137	07/27/2021 1513
6:2 FTS	1.9	2.1		1	110	64-140	07/27/2021 1513
4:2 FTS	1.9	1.5		1	79	62-145	07/27/2021 1513
GenX	4.0	4.0		1	99	70-150	07/27/2021 1513
ADONA	1.9	2.1		1	110	70-130	07/27/2021 1513
EtFOSAA	2.0	2.1		1	104	61-139	07/27/2021 1513
MeFOSAA	2.0	2.2		1	110	63-144	07/27/2021 1513
PFBS	1.8	1.7		1	94	72-128	07/27/2021 1513
PFDS	1.9	2.2		1	117	59-134	07/27/2021 1513
PFHpS	1.9	2.1		1	110	70-132	07/27/2021 1513
PFNS	1.9	1.9		1	99	69-125	07/27/2021 1513
PFOSA	2.0	1.8		1	90	67-137	07/27/2021 1513
PFPeS	1.9	2.0		1	106	73-123	07/27/2021 1513
PFHxS	1.8	1.8		1	97	67-130	07/27/2021 1513
PFBA	2.0	2.2		1	109	71-135	07/27/2021 1513
PFDA	2.0	2.2		1	109	69-133	07/27/2021 1513
PFDoA	2.0	2.2		1	108	69-135	07/27/2021 1513
PFHpA	2.0	2.1		1	106	71-131	07/27/2021 1513
PFHxA	2.0	2.2		1	110	70-132	07/27/2021 1513
PFNA	2.0	2.0		1	101	72-129	07/27/2021 1513
PFOA	2.0	2.2		1	111	69-133	07/27/2021 1513
PFPeA	2.0	2.2		1	112	69-132	07/27/2021 1513
PFTeDA	2.0	2.2		1	108	69-133	07/27/2021 1513
PFTrDA	2.0	2.3		1	114	66-139	07/27/2021 1513
PFUdA	2.0	2.4		1	119	64-136	07/27/2021 1513
PFOS	1.9	1.7		1	92	68-136	07/27/2021 1513

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99970-002
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	50-150
13C7_PFUdA		80	50-150
13C8_PFOA		80	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		99	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20002-019MS
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	2.3	2.6		1	113	70-130	07/27/2021 2208
11Cl-PF3OUdS	ND	2.3	2.2		1	96	70-130	07/27/2021 2208
8:2 FTS	ND	2.4	2.5		1	105	65-137	07/27/2021 2208
6:2 FTS	ND	2.3	1.1	N	1	48	64-140	07/27/2021 2208
4:2 FTS	ND	2.3	2.3		1	100	62-145	07/27/2021 2208
GenX	ND	5.0	5.6		1	112	70-130	07/27/2021 2208
ADONA	ND	2.3	2.3		1	100	70-130	07/27/2021 2208
EtFOSAA	ND	2.5	2.6		1	106	61-139	07/27/2021 2208
MeFOSAA	ND	2.5	3.0		1	120	63-144	07/27/2021 2208
PFBS	ND	2.2	2.7		1	121	72-128	07/27/2021 2208
PFDS	ND	2.4	2.9		1	123	59-134	07/27/2021 2208
PFHpS	ND	2.4	2.5		1	107	70-132	07/27/2021 2208
PFNS	ND	2.4	2.7		1	113	69-125	07/27/2021 2208
PFOSA	ND	2.5	2.7		1	108	67-137	07/27/2021 2208
PFPeS	ND	2.3	2.7		1	116	73-123	07/27/2021 2208
PFHxS	1.2	2.3	3.6		1	104	67-130	07/27/2021 2208
PFBA	1.1	2.5	3.9		1	110	71-135	07/27/2021 2208
PFDA	ND	2.5	3.0		1	121	69-133	07/27/2021 2208
PFDoA	ND	2.5	3.0		1	122	69-135	07/27/2021 2208
PFHpA	0.45	2.5	3.5		1	123	71-131	07/27/2021 2208
PFHxA	0.86	2.5	3.2		1	96	70-132	07/27/2021 2208
PFNA	0.25	2.5	3.2		1	127	72-129	07/27/2021 2208
PFOA	1.8	2.5	4.7		1	116	69-133	07/27/2021 2208
PFPeA	0.65	2.5	3.1		1	99	69-132	07/27/2021 2208
PFTeDA	ND	2.5	2.7		1	110	69-133	07/27/2021 2208
PFTrDA	ND	2.5	3.1		1	127	66-139	07/27/2021 2208
PFUdA	ND	2.5	2.7		1	108	64-136	07/27/2021 2208
PFOS	4.2	2.3	7.4	N	1	140	68-136	07/27/2021 2208

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	50-150
13C2_6:2FTS		91	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		75	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		77	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		76	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20002-019MS
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		75	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		93	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		75	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20002-019MD
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Parameter	Sample Amount (ug/kg)	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	2.1	2.3		1	110	11	70-130	30	07/27/2021 2219
11Cl-PF3OUdS	ND	2.1	2.2		1	103	1.1	70-130	30	07/27/2021 2219
8:2 FTS	ND	2.2	2.0		1	90	23	65-137	30	07/27/2021 2219
6:2 FTS	ND	2.2	1.9	+	1	87	50	64-140	30	07/27/2021 2219
4:2 FTS	ND	2.1	2.4		1	113	4.0	62-145	30	07/27/2021 2219
GenX	ND	4.5	4.3		1	95	25	70-130	30	07/27/2021 2219
ADONA	ND	2.1	2.1		1	96	13	70-130	30	07/27/2021 2219
EtFOSAA	ND	2.3	2.1		1	92	23	61-139	30	07/27/2021 2219
MeFOSAA	ND	2.3	2.4		1	108	20	63-144	30	07/27/2021 2219
PFBS	ND	2.0	2.1		1	107	22	72-128	30	07/27/2021 2219
PFDS	ND	2.2	2.7		1	124	6.7	59-134	30	07/27/2021 2219
PFHpS	ND	2.2	2.0		1	93	22	70-132	30	07/27/2021 2219
PFNS	ND	2.2	2.2		1	102	19	69-125	30	07/27/2021 2219
PFOSA	ND	2.3	2.3		1	100	17	67-137	30	07/27/2021 2219
PFPeS	ND	2.1	2.3		1	109	15	73-123	30	07/27/2021 2219
PFHxS	1.2	2.1	2.9		1	81	21	67-130	30	07/27/2021 2219
PFBA	1.1	2.3	3.4		1	100	13	71-135	30	07/27/2021 2219
PFDA	ND	2.3	2.7		1	121	9.0	69-133	30	07/27/2021 2219
PFDoA	ND	2.3	2.6		1	113	16	69-135	30	07/27/2021 2219
PFHpA	0.45	2.3	2.6		1	96	28	71-131	30	07/27/2021 2219
PFHxA	0.86	2.3	2.8		1	87	13	70-132	30	07/27/2021 2219
PFNA	0.25	2.3	2.6		1	116	19	72-129	30	07/27/2021 2219
PFOA	1.8	2.3	4.3		1	107	9.8	69-133	30	07/27/2021 2219
PFPeA	0.65	2.3	2.9		1	100	6.0	69-132	30	07/27/2021 2219
PFTeDA	ND	2.3	2.2		1	96	22	69-133	30	07/27/2021 2219
PFTrDA	ND	2.3	2.5		1	112	21	66-139	30	07/27/2021 2219
PFUdA	ND	2.3	2.6		1	115	2.3	64-136	30	07/27/2021 2219
PFOS	4.2	2.1	5.3	N,+	1	53	33	68-136	30	07/27/2021 2219

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		90	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		80	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20002-019MD
Batch: 99970
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 07/25/2021 1645

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		81	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		81	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		97	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
ERB-071321-S	112	128	109	107	97	103	102	107	110
WQ99902-001	84	79	71	71	65	71	74	88	81
WQ99902-002	86	89	75	72	73	78	83	94	85

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
ERB-071321-S	112	107	103	101	98	118	103	103	
WQ99902-001	75	81	81	76	67	81	71	78	
WQ99902-002	82	79	85	82	80	87	76	82	

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
ERB-071321-S	108	108	106						0
WQ99902-001	77	78	77						0
WQ99902-002	82	84	83						0

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Soil

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC7-SB01-0-0.5	89	98	91	87	89	81	83	93	83
AOPC7-SB01-0.5-2	84	87	89	89	83	80	90	93	82
AOPC7-SB02-0-0.5	69	82	74	69	72	63	67	75	66
AOPC7-SB02-0-0.5	91	96	87	94	91	89	89	94	88
AOPC7-SB02-0.5-2	83	95	89	77	80	79	87	87	79
AOPC7-SB02-0.5-2	90	97	94	88	90	91	93	97	91
AOPC1-SB01-0-0.5	84	93	89	81	83	78	74	83	76
AOPC1-SB01-0.5-2	83	91	96	77	86	76	83	84	77
AOPC1-SB02-0-0.5	108	135	214 *	95	84	90	98	88	84
AOPC1-SB02-0.5-2	78	98	92	80	81	73	79	83	76
AOPC1-SB03-0-0.5	84	97	98	86	84	73	81	84	78
AOPC1-SB03-0-0.5	92	102	90	85	94	91	91	94	89
AOPC1-SB03-0.5-2	68	74	77	72	75	61	71	73	68
AOPC1-SB03-0.5-2	93	97	88	94	92	88	87	97	91
AOPC1-SB04-0-0.5	98	107	149	93	87	81	88	87	84
AOPC1-SB04-0.5-2	87	94	92	84	85	73	82	89	79
AOPC6-SB01-0-0.5	81	89	112	88	83	77	86	84	82
AOPC6-SB01-0.5-2	91	92	89	88	87	86	84	92	84
AOPC6-SB01-0.5-2	96	97	93	89	93	88	97	99	93
AOPC2-SB01-0-0.5	70	70	81	65	66	69	74	74	65
AOPC2-SB01-0.5-2	87	95	94	87	84	80	86	89	84
AOPC2-SB02-0-0.5	87	91	89	76	77	79	80	83	77
AOPC2-SB02-0.5-2	81	90	87	75	79	76	80	84	78
AOPC2-SB03-0-0.5	87	94	95	85	88	81	87	86	84
AOPC2-SB03-0.5-2	86	86	92	79	88	79	81	87	83
AOPC2-SB04-0-0.5	89	90	91	76	82	76	87	81	73
AOPC2-SB04-0.5-2	90	88	87	90	90	80	86	90	83
AOPC2-SB05-0-0.5	89	93	91	87	91	86	89	87	87
AOPC2-SB05-0.5-2	83	89	86	78	83	82	81	85	81
AOPC2-SB06-0-0.5	84	86	87	80	88	81	86	84	79

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Soil

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC2-SB06-0.5-2	84	88	82	82	84	77	76	83	78
AOPC2-SB07-0-0.5	83	88	92	82	86	78	84	86	82
AOPC2-SB07-0.5-2	80	90	85	80	88	82	78	89	81
WQ99970-001	85	97	93	85	84	80	84	93	83
WQ99970-002	86	92	85	85	86	83	83	93	82
AOPC2-SB03-0-0.5MS	81	91	88	74	81	75	89	77	76
AOPC2-SB03-0-0.5MSD	90	90	95	88	88	79	89	88	80
WQ10065-001	86	88	84	87	87	75	82	88	84
WQ10065-002	91	92	86	85	89	80	84	88	86
AOPC2-SB03-0.5-2MS	84	93	94	77	89	88	83	89	85
AOPC2-SB03-0.5-2MSD	82	87	88	83	90	82	81	86	80

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Soil

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC7-SB01-0-0.5	91	85	83	90	88	83	85	103	
AOPC7-SB01-0.5-2	83	76	82	83	84	81	82	94	
AOPC7-SB02-0-0.5	71	70	66	70	75	71	61	78	
AOPC7-SB02-0-0.5	90	86	91	81	98	89	96	97	
AOPC7-SB02-0.5-2	80	79	79	86	84	84	58	99	
AOPC7-SB02-0.5-2	96	85	92	93	90	98	93	92	
AOPC1-SB01-0-0.5	89	79	76	80	83	77	83	95	
AOPC1-SB01-0.5-2	82	79	79	78	88	76	77	88	
AOPC1-SB02-0-0.5	94	86	87	101	99	83	90	103	
AOPC1-SB02-0.5-2	77	74	76	84	81	75	78	90	
AOPC1-SB03-0-0.5	85	79	79	81	87	79	73	90	
AOPC1-SB03-0-0.5	88	86	94	87	98	93	93	99	
AOPC1-SB03-0.5-2	77	67	71	69	81	67	59	82	
AOPC1-SB03-0.5-2	92	83	95	87	91	93	92	96	
AOPC1-SB04-0-0.5	89	84	82	90	98	76	82	103	
AOPC1-SB04-0.5-2	86	80	81	90	84	77	79	91	
AOPC6-SB01-0-0.5	84	81	83	90	83	76	86	94	
AOPC6-SB01-0.5-2	90	86	86	82	86	86	70	99	
AOPC6-SB01-0.5-2	97	88	97	91	97	97	96	95	
AOPC2-SB01-0-0.5	69	67	66	74	75	67	71	75	
AOPC2-SB01-0.5-2	90	82	83	83	94	82	83	98	
AOPC2-SB02-0-0.5	81	73	76	77	83	74	79	83	
AOPC2-SB02-0.5-2	80	78	78	82	82	77	82	88	
AOPC2-SB03-0-0.5	89	80	83	82	88	80	83	102	
AOPC2-SB03-0.5-2	81	77	88	79	85	89	92	86	
AOPC2-SB04-0-0.5	84	75	76	77	77	76	87	93	
AOPC2-SB04-0.5-2	85	80	85	85	84	89	86	87	
AOPC2-SB05-0-0.5	90	84	92	83	87	93	92	88	
AOPC2-SB05-0.5-2	84	78	85	84	84	90	86	87	
AOPC2-SB06-0-0.5	82	74	81	74	86	82	86	92	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Soil

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC2-SB06-0.5-2	82	75	82	79	77	87	86	84	
AOPC2-SB07-0-0.5	85	80	84	80	93	85	84	91	
AOPC2-SB07-0.5-2	80	78	83	82	85	86	88	84	
WQ99970-001	80	84	84	85	86	84	79	88	
WQ99970-002	87	84	84	82	80	80	80	99	
AOPC2-SB03-0-0.5MS	77	77	76	79	85	75	79	93	
AOPC2-SB03-0-0.5MSD	83	89	82	81	85	81	85	97	
WQ10065-001	86	81	90	80	83	84	84	87	
WQ10065-002	88	81	85	83	88	88	81	90	
AOPC2-SB03-0.5-2MS	86	80	85	84	86	87	88	90	
AOPC2-SB03-0.5-2MSD	85	75	84	84	87	86	89	81	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Soil

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC7-SB01-0-0.5	84	87	87						0
AOPC7-SB01-0.5-2	81	89	86						0
AOPC7-SB02-0-0.5	63	79	77						0
AOPC7-SB02-0-0.5	93	97	93						0
AOPC7-SB02-0.5-2	60	88	87						0
AOPC7-SB02-0.5-2	96	93	99						0
AOPC1-SB01-0-0.5	79	84	83						0
AOPC1-SB01-0.5-2	81	81	82						0
AOPC1-SB02-0-0.5	94	140	142						1
AOPC1-SB02-0.5-2	79	84	82						0
AOPC1-SB03-0-0.5	73	99	91						0
AOPC1-SB03-0-0.5	95	100	94						0
AOPC1-SB03-0.5-2	62	74	76						0
AOPC1-SB03-0.5-2	91	98	101						0
AOPC1-SB04-0-0.5	88	116	119						0
AOPC1-SB04-0.5-2	80	78	80						0
AOPC6-SB01-0-0.5	86	105	110						0
AOPC6-SB01-0.5-2	68	95	91						0
AOPC6-SB01-0.5-2	94	105	100						0
AOPC2-SB01-0-0.5	68	68	66						0
AOPC2-SB01-0.5-2	87	93	95						0
AOPC2-SB02-0-0.5	75	89	76						0
AOPC2-SB02-0.5-2	77	75	77						0
AOPC2-SB03-0-0.5	83	78	86						0
AOPC2-SB03-0.5-2	87	81	83						0
AOPC2-SB04-0-0.5	82	82	82						0
AOPC2-SB04-0.5-2	89	87	83						0
AOPC2-SB05-0-0.5	94	102	99						0
AOPC2-SB05-0.5-2	89	89	86						0
AOPC2-SB06-0-0.5	88	72	70						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Soil

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC2-SB06-0.5-2	86	81	83						0
AOPC2-SB07-0-0.5	84	84	81						0
AOPC2-SB07-0.5-2	84	82	91						0
WQ99970-001	84	95	99						0
WQ99970-002	86	95	95						0
AOPC2-SB03-0-0.5MS	81	75	81						0
AOPC2-SB03-0-0.5MSD	83	84	85						0
WQ10065-001	87	96	90						0
WQ10065-002	97	98	101						0
AOPC2-SB03-0.5-2MS	85	88	81						0
AOPC2-SB03-0.5-2MSD	85	76	83						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 3
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Soil

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): AOPC2-SB03-0-0.5

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2 Lab Sample ID: WG20002-019MS

Concentration Units (ug/L, mg/L, ug/kg): ug/kg

ANALYTE	SPIKE ADDED	SAMPLE CONCENTRATION	MS CONCENTRATION	MS %REC	#	QC LIMITS REC.
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	2.3		2.6	113		70-130
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.3		2.2	96		70-130
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	2.4		2.5	105		65-137
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	2.3		1.1	48	*	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	2.3		2.3	100		62-145
Hexafluoropropylene oxide dimer acid (GenX)	5.0		5.6	112		70-130
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	2.3		2.3	100		70-130
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2.5		2.6	106		61-139
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2.5		3	120		63-144
Perfluoro-1-butanesulfonic acid (PFBS)	2.2		2.7	121		72-128
Perfluoro-1-decanesulfonic acid (PFDS)	2.4		2.9	123		59-134
Perfluoro-1-heptanesulfonic acid (PFHpS)	2.4		2.5	107		70-132
Perfluoro-1-nonanesulfonic acid (PFNS)	2.4		2.7	113		69-125
Perfluoro-1-octanesulfonamide (PFOSA)	2.5		2.7	108		67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	2.3		2.7	116		73-123
Perfluorohexanesulfonic acid (PFHxS)	2.3	1.2	3.6	104		67-130
Perfluoro-n-butanoic acid (PFBA)	2.5	1.1	3.9	110		71-135
Perfluoro-n-decanoic acid (PFDA)	2.5		3	121		69-133
Perfluoro-n-dodecanoic acid (PFDoA)	2.5		3	122		69-135
Perfluoro-n-heptanoic acid (PFHpA)	2.5	0.45	3.5	123		71-131
Perfluoro-n-hexanoic acid (PFHxA)	2.5	0.86	3.2	96		70-132
Perfluoro-n-nonanoic acid (PFNA)	2.5	0.25	3.2	127		72-129
Perfluoro-n-octanoic acid (PFOA)	2.5	1.8	4.7	116		69-133
Perfluoro-n-pentanoic acid (PFPeA)	2.5	0.65	3.1	99		69-132
Perfluoro-n-tetradecanoic acid (PFTeDA)	2.5		2.7	110		69-133
Perfluoro-n-tridecanoic acid (PFTrDA)	2.5		3.1	127		66-139
Perfluoro-n-undecanoic acid (PFUdA)	2.5		2.7	108		64-136
Perfluorooctanesulfonic acid (PFOS)	2.3	4.2	7.4	140	*	68-136

* Values outside of QC Limits

FORM 3
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Soil

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): AOPC2-SB03-0-0.5

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2 Lab Sample ID: WG20002-019MS

Concentration Units (ug/L, mg/L, ug/kg): ug/kg

ANALYTE	SPIKE ADDED	MSD CONCENTRATION	MSD %R #	RPD #	QC LIMITS	
					RPD	%R
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	2.1	2.3	110	11	0-30	70-130
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.1	2.2	103	1.1	0-30	70-130
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	2.2	2	90	23	0-30	65-137
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	2.2	1.9	87	50 *	0-30	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	2.1	2.4	113	4.0	0-30	62-145
Hexafluoropropylene oxide dimer acid (GenX)	4.5	4.3	95	25	0-30	70-130
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	2.1	2.1	96	13	0-30	70-130
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2.3	2.1	92	23	0-30	61-139
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2.3	2.4	108	20	0-30	63-144
Perfluoro-1-butanesulfonic acid (PFBS)	2.0	2.1	107	22	0-30	72-128
Perfluoro-1-decanesulfonic acid (PFDS)	2.2	2.7	124	6.7	0-30	59-134
Perfluoro-1-heptanesulfonic acid (PFHpS)	2.2	2	93	22	0-30	70-132
Perfluoro-1-nonanesulfonic acid (PFNS)	2.2	2.2	102	19	0-30	69-125
Perfluoro-1-octanesulfonamide (PFOSA)	2.3	2.3	100	17	0-30	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	2.1	2.3	109	15	0-30	73-123
Perfluorohexanesulfonic acid (PFHxS)	2.1	2.9	81	21	0-30	67-130
Perfluoro-n-butanoic acid (PFBA)	2.3	3.4	100	13	0-30	71-135
Perfluoro-n-decanoic acid (PFDA)	2.3	2.7	121	9.0	0-30	69-133
Perfluoro-n-dodecanoic acid (PFDoA)	2.3	2.6	113	16	0-30	69-135
Perfluoro-n-heptanoic acid (PFHpA)	2.3	2.6	96	28	0-30	71-131
Perfluoro-n-hexanoic acid (PFHxA)	2.3	2.8	87	13	0-30	70-132
Perfluoro-n-nonanoic acid (PFNA)	2.3	2.6	116	19	0-30	72-129
Perfluoro-n-octanoic acid (PFOA)	2.3	4.3	107	9.8	0-30	69-133
Perfluoro-n-pentanoic acid (PFPeA)	2.3	2.9	100	6.0	0-30	69-132
Perfluoro-n-tetradecanoic acid (PFTeDA)	2.3	2.2	96	22	0-30	69-133
Perfluoro-n-tridecanoic acid (PFTrDA)	2.3	2.5	112	21	0-30	66-139
Perfluoro-n-undecanoic acid (PFUdA)	2.3	2.6	115	2.3	0-30	64-136
Perfluorooctanesulfonic acid (PFOS)	2.1	5.3	53 *	33 *	0-30	68-136

* Values outside of QC Limits

FORM 3
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Soil

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): AOPC2-SB03-0.5-2

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2 Lab Sample ID: WG20002-020MS

Concentration Units (ug/L, mg/L, ug/kg): ug/kg

ANALYTE	SPIKE ADDED	SAMPLE CONCENTRATION	MS CONCENTRATION	MS %REC	#	QC LIMITS REC.
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	2.1		2.5	116		70-130
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.2		2.5	115		70-130
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	2.3			0.00	*	65-137
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	2.2		1.8	85		64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	2.1		2.6	121		62-145
Hexafluoropropylene oxide dimer acid (GenX)	4.6		4.7	103		70-130
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	2.2		2.3	107		70-130
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2.3		2.4	103		61-139
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2.3		2.7	116		63-144
Perfluoro-1-butanesulfonic acid (PFBS)	2.0		2.6	127		72-128
Perfluoro-1-decanesulfonic acid (PFDS)	2.2		2.1	95		59-134
Perfluoro-1-heptanesulfonic acid (PFHpS)	2.2		2.3	105		70-132
Perfluoro-1-nonanesulfonic acid (PFNS)	2.2		2.9	133	*	69-125
Perfluoro-1-octanesulfonamide (PFOSA)	2.3		2.6	113		67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	2.1		2.4	114		73-123
Perfluorohexanesulfonic acid (PFHxS)	2.1		2.5	118		67-130
Perfluoro-n-butanoic acid (PFBA)	2.3		2.9	128		71-135
Perfluoro-n-decanoic acid (PFDA)	2.3		2.5	111		69-133
Perfluoro-n-dodecanoic acid (PFDoA)	2.3		3	129		69-135
Perfluoro-n-heptanoic acid (PFHpA)	2.3		2.5	111		71-131
Perfluoro-n-hexanoic acid (PFHxA)	2.3		2.8	123		70-132
Perfluoro-n-nonanoic acid (PFNA)	2.3		2.7	118		72-129
Perfluoro-n-octanoic acid (PFOA)	2.3		2.9	128		69-133
Perfluoro-n-pentanoic acid (PFPeA)	2.3		2.7	117		69-132
Perfluoro-n-tetradecanoic acid (PFTeDA)	2.3		2.5	109		69-133
Perfluoro-n-tridecanoic acid (PFTrDA)	2.3		3.3	144	*	66-139
Perfluoro-n-undecanoic acid (PFUdA)	2.3		2.9	128		64-136
Perfluorooctanesulfonic acid (PFOS)	2.1		2	95		68-136

* Values outside of QC Limits

FORM 3
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Soil

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): AOPC2-SB03-0.5-2

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2 Lab Sample ID: WG20002-020MS

Concentration Units (ug/L, mg/L, ug/kg): ug/kg

ANALYTE	SPIKE ADDED	MSD CONCENTRATION	MSD %R #	RPD #	QC LIMITS	
					RPD	%R
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	2.0	2.1	106	17	0-30	70-130
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.0	2.2	112	10	0-30	70-130
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	2.0	2.2	107	200 *	0-30	65-137
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	2.0	5.2	260 *	95 *	0-30	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	2.0	2.5	128	2.8	0-30	62-145
Hexafluoropropylene oxide dimer acid (GenX)	4.2	4.5	108	4.0	0-30	70-130
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	2.0	2.3	115	1.5	0-30	70-130
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2.1	2.3	107	4.9	0-30	61-139
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2.1	2	94	29	0-30	63-144
Perfluoro-1-butanesulfonic acid (PFBS)	1.9	2.2	120	14	0-30	72-128
Perfluoro-1-decanesulfonic acid (PFDS)	2.0	2.4	118	13	0-30	59-134
Perfluoro-1-heptanesulfonic acid (PFHpS)	2.0	2.6	131	14	0-30	70-132
Perfluoro-1-nonanesulfonic acid (PFNS)	2.0	2.5	124	16	0-30	69-125
Perfluoro-1-octanesulfonamide (PFOSA)	2.1	2.3	108	13	0-30	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	2.0	2.3	117	4.5	0-30	73-123
Perfluorohexanesulfonic acid (PFHxS)	1.9	2.2	116	9.7	0-30	67-130
Perfluoro-n-butanoic acid (PFBA)	2.1	2.8	132	5.5	0-30	71-135
Perfluoro-n-decanoic acid (PFDA)	2.1	2.6	123	1.9	0-30	69-133
Perfluoro-n-dodecanoic acid (PFDoA)	2.1	2.5	119	17	0-30	69-135
Perfluoro-n-heptanoic acid (PFHpA)	2.1	2.4	112	7.3	0-30	71-131
Perfluoro-n-hexanoic acid (PFHxA)	2.1	2.5	118	12	0-30	70-132
Perfluoro-n-nonanoic acid (PFNA)	2.1	2.5	117	8.6	0-30	72-129
Perfluoro-n-octanoic acid (PFOA)	2.1	2.6	123	12	0-30	69-133
Perfluoro-n-pentanoic acid (PFPeA)	2.1	2.5	120	5.6	0-30	69-132
Perfluoro-n-tetradecanoic acid (PFTeDA)	2.1	2.3	109	8.5	0-30	69-133
Perfluoro-n-tridecanoic acid (PFTrDA)	2.1	2.7	126	22	0-30	66-139
Perfluoro-n-undecanoic acid (PFUdA)	2.1	2.5	118	17	0-30	64-136
Perfluorooctanesulfonic acid (PFOS)	2.0	2.2	110	7.0	0-30	68-136

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Soil

Client Sample ID: WQ99970-002 Lab Sample ID: WQ99970-002

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2

Concentration Units (ug/L, mg/L, ug/kg): ug/kg

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	1.9	1.8	96	70-130
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	1.9	2.3	122	65-137
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	1.9	2.1	110	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	1.9	1.5	79	62-145
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.9	2.1	110	70-130
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	1.9	2.1	113	70-130
Hexafluoropropylene oxide dimer acid (GenX)	4.0	4	99	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2.0	2.1	104	61-139
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2.0	2.2	110	63-144
Perfluoro-1-butanesulfonic acid (PFBS)	1.8	1.7	94	72-128
Perfluoro-1-decanesulfonic acid (PFDS)	1.9	2.2	117	59-134
Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	2.1	110	70-132
Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	1.9	99	69-125
Perfluoro-1-octanesulfonamide (PFOSA)	2.0	1.8	90	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	2	106	73-123
Perfluoro-n-butanoic acid (PFBA)	2.0	2.2	109	71-135
Perfluoro-n-decanoic acid (PFDA)	2.0	2.2	109	69-133
Perfluoro-n-dodecanoic acid (PFDoA)	2.0	2.2	108	69-135
Perfluoro-n-heptanoic acid (PFHpA)	2.0	2.1	106	71-131
Perfluoro-n-hexanoic acid (PFHxA)	2.0	2.2	110	70-132
Perfluoro-n-nonanoic acid (PFNA)	2.0	2	101	72-129
Perfluoro-n-octanoic acid (PFOA)	2.0	2.2	111	69-133
Perfluoro-n-pentanoic acid (PFPeA)	2.0	2.2	112	69-132
Perfluoro-n-tetradecanoic acid (PFTeDA)	2.0	2.2	108	69-133
Perfluoro-n-tridecanoic acid (PFTrDA)	2.0	2.3	114	66-139
Perfluoro-n-undecanoic acid (PFUdA)	2.0	2.4	119	64-136
Perfluorohexanesulfonic acid (PFHxS)	1.8	1.8	97	67-130
Perfluorooctanesulfonic acid (PFOS)	1.9	1.7	92	68-136

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Soil

Client Sample ID: WQ10065-002 Lab Sample ID: WQ10065-002

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2

Concentration Units (ug/L, mg/L, ug/kg): ug/kg

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	1.9	2.3	121	70-130
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	1.9	2	106	65-137
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	1.9	1.7	88	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	1.9	2	106	62-145
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.9	2.1	114	70-130
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	1.9	2.3	125	70-130
Hexafluoropropylene oxide dimer acid (GenX)	4.0	4.6	114	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2.0	2.3	117	61-139
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2.0	1.7	87	63-144
Perfluoro-1-butanesulfonic acid (PFBS)	1.8	1.9	111	72-128
Perfluoro-1-decanesulfonic acid (PFDS)	1.9	2.4	125	59-134
Perfluoro-1-heptanesulfonic acid (PFHpS)	1.9	2.3	124	70-132
Perfluoro-1-nonanesulfonic acid (PFNS)	1.9	2.4	124	69-125
Perfluoro-1-octanesulfonamide (PFOSA)	2.0	2	102	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	1.9	2.3	122	73-123
Perfluoro-n-butanoic acid (PFBA)	2.0	2.3	113	71-135
Perfluoro-n-decanoic acid (PFDA)	2.0	2.3	114	69-133
Perfluoro-n-dodecanoic acid (PFDoA)	2.0	2.2	112	69-135
Perfluoro-n-heptanoic acid (PFHpA)	2.0	2.2	112	71-131
Perfluoro-n-hexanoic acid (PFHxA)	2.0	2.2	111	70-132
Perfluoro-n-nonanoic acid (PFNA)	2.0	2.1	104	72-129
Perfluoro-n-octanoic acid (PFOA)	2.0	2.4	121	69-133
Perfluoro-n-pentanoic acid (PFPeA)	2.0	2.2	109	69-132
Perfluoro-n-tetradecanoic acid (PFTeDA)	2.0	2.3	117	69-133
Perfluoro-n-tridecanoic acid (PFTrDA)	2.0	2.6	132	66-139
Perfluoro-n-undecanoic acid (PFUdA)	2.0	2.3	113	64-136
Perfluorohexanesulfonic acid (PFHxS)	1.8	2	108	67-130
Perfluorooctanesulfonic acid (PFOS)	1.9	2.2	116	68-136

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ99902-002 Lab Sample ID: WQ99902-002

Instrument ID: _Sciex 4500_LCMSMS1

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	14	95	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	18	118	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	11	75	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	16	107	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	16	104	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	16	107	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	30	94	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	15	96	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	15	93	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	15	105	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	19	121	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	16	104	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	16	101	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	16	101	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	16	105	71-127
Perfluoro-n-butanoic acid (PFBA)	16	17	105	73-129
Perfluoro-n-decanoic acid (PFDA)	16	17	109	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	18	110	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	19	119	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	18	113	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	17	105	69-130
Perfluoro-n-octanoic acid (PFOA)	16	17	108	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	16	102	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	16	102	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	20	122	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	14	90	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	15	101	68-131
Perfluorooctanesulfonic acid (PFOS)	15	14	94	65-140

* Values outside of QC Limits

CLIENT SAMPLE ID

WQ99970-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG20002

Project No.: 103IG667601
Lab Sample ID: WQ99970-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Soil

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/25/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/27/2021

Time Analyzed: 15:02

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC7-SB01-0-0.5	WG20002-001		17:53
AOPC7-SB01-0.5-2	WG20002-002		18:25
AOPC7-SB02-0-0.5	WG20002-003		18:35
AOPC7-SB02-0-0.5	WG20002-003		14:36
AOPC7-SB02-0.5-2	WG20002-004		18:46
AOPC7-SB02-0.5-2	WG20002-004		14:46
AOPC1-SB01-0-0.5	WG20002-005		18:56
AOPC1-SB01-0.5-2	WG20002-006		19:07
AOPC1-SB02-0-0.5	WG20002-007		19:18
AOPC1-SB02-0.5-2	WG20002-008		19:28
AOPC1-SB03-0-0.5	WG20002-009		19:39
AOPC1-SB03-0-0.5	WG20002-009		14:57
AOPC1-SB03-0.5-2	WG20002-010		19:50
AOPC1-SB03-0.5-2	WG20002-010		15:08
AOPC1-SB04-0-0.5	WG20002-011		20:00
AOPC1-SB04-0.5-2	WG20002-012		20:43
AOPC6-SB01-0-0.5	WG20002-013		20:54
AOPC6-SB01-0.5-2	WG20002-014		21:04
AOPC6-SB01-0.5-2	WG20002-014		15:39
AOPC2-SB01-0-0.5	WG20002-015		21:15
AOPC2-SB01-0.5-2	WG20002-016		21:26
AOPC2-SB02-0-0.5	WG20002-017		21:36
AOPC2-SB02-0.5-2	WG20002-018		21:47
AOPC2-SB03-0-0.5	WG20002-019		21:58
AOPC2-SB04-0-0.5	WG20002-021		22:29
WQ99970-002	WQ99970-002		15:13
AOPC2-SB03-0-0.5MS	WG20002-019MS		22:08
AOPC2-SB03-0-0.5MSD	WG20002-019MD		22:19

CLIENT SAMPLE ID

WQ10065-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20002

Project No.: 103IG667601 Lab Sample ID: WQ10065-001

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Soil

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2 Lab File ID:

Extraction Type: SOP SPE Date Extracted: 07/26/2021

LC Column: Gemini C18 ID: 2.00 (mm) Date Analyzed: 07/28/2021

Time Analyzed: 19:54

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC2-SB03-0.5-2	WG20002-020		20:16
AOPC2-SB04-0.5-2	WG20002-022		20:48
AOPC2-SB05-0-0.5	WG20002-023		20:58
AOPC2-SB05-0.5-2	WG20002-024		21:09
AOPC2-SB06-0-0.5	WG20002-025		21:20
AOPC2-SB06-0.5-2	WG20002-026		21:30
AOPC2-SB07-0-0.5	WG20002-027		21:41
AOPC2-SB07-0.5-2	WG20002-028		21:52
WQ10065-002	WQ10065-002		20:05
AOPC2-SB03-0.5-2MS	WG20002-020MS		20:26
AOPC2-SB03-0.5-2MSD	WG20002-020MD		20:37

CLIENT SAMPLE ID

WQ99902-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG20002

Project No.: 103IG667601
Lab Sample ID: WQ99902-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex 4500_LCMSMS1
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/23/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/25/2021

Time Analyzed: 23:08

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
ERB-071321-S	WG20002-029		15:26
WQ99902-002	WQ99902-002		23:18

Pace Environmental Services, LLC
Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.321	3.288	4.138	4.137	3.727	3.671	3.337	3.480	3.690	3.810	3.659	2.808-4.645	0.30603	1.863
1 4:2 FTS	0.853	1.412	1.669	1.502	1.395	1.625	1.846	1.498	1.511	1.755	1.506	0.620-2.169	0.25803	0.697
15 PFHxA	18.557	15.829	15.562	14.692	15.325	17.499	16.990	17.248	16.985	15.608	16.429	11.883-18.766	1.14721	7.662
22 PFPeS	3.746	3.334	2.960	3.382	3.079	3.193	3.233	3.322	3.504	3.320	3.307	2.441-3.716	0.21265	1.539
28 GenX	0.871	0.833	0.776	0.772	0.799	0.732	0.728	0.806	0.738	0.726	0.778	0.656-0.941	0.04748	0.399
13 PFHpA	3.068	2.922	2.751	3.071	3.398	3.373	3.442	2.961	3.375	3.126	3.148	2.699-4.096	0.23299	1.699
14 PFHxS	2.926	3.405	3.429	3.261	3.461	3.408	3.429	3.352	3.276	3.261	3.320	2.815-4.106	0.21512	1.730
29 ADONA	2.310	2.436	3.294	2.588	2.531	2.494	2.531	2.426	2.375	2.432	2.541	1.429-3.632	0.36718	1.265
2 6:2 FTS	1.155	1.375	1.414	1.626	1.416	1.669	1.457	1.551	1.691	1.541	1.489	0.953-1.878	0.15432	0.708
20 PFOA	2.503	2.945	2.501	3.127	2.626	2.757	2.876	2.849	2.742	2.665	2.759	2.025-3.226	0.20024	1.313
12 PFHpS	3.678	4.415	3.526	3.215	3.738	3.239	3.394	3.365	3.669	3.502	3.574	2.716-4.759	0.34054	1.869
18 PFOS	3.197	4.346	4.230	3.674	3.760	3.686	3.838	4.082	4.322	3.923	3.905	2.749-4.770	0.33686	1.880
17 PFNA	5.255	5.083	4.792	4.705	4.821	5.027	4.843	4.728	4.491	4.697	4.844	4.184-5.457	0.21216	2.410
19 PFOSA	75.390	24.756	40.572	39.362	43.922	41.633	39.152	37.527	39.958	41.159	42.343	6.076-81.767	12.61508	21.961
16 PFNS	4.131	2.605	3.992	3.093	3.220	3.525	4.244	3.245	3.351	3.283	3.468	1.639-4.800	0.52682	1.610
3 8:2 FTS	Disabled	1.087	0.920	1.278	1.337	1.654	1.581	1.444	1.511	1.542	1.372	0.628-2.045	0.23632	0.668
10 PFDA	11.555	17.454	9.696	11.433	9.469	10.411	10.327	10.800	10.458	10.081	11.168	2.522-16.415	2.31557	4.734
6 N-MeFOSAA	1.058	1.409	1.233	1.486	1.424	1.493	1.504	1.465	1.427	1.446	1.394	0.993-1.854	0.14353	0.712
9 PFDS	3.649	3.205	3.762	3.092	3.783	3.312	3.163	3.349	3.136	3.215	3.366	2.927-4.638	0.28525	1.891
5 N-EtFOSAA	1.821	1.842	1.797	1.581	2.065	1.724	1.809	1.746	1.778	1.825	1.798	1.716-2.413	0.11610	1.032
25 PFUdA	13.785	9.546	10.529	13.385	10.254	9.559	10.088	9.803	10.638	10.369	10.795	5.713-14.794	1.51356	5.127
26 MeFOSA	0.699	1.058	1.195	0.934	1.057	1.068	1.136	1.088	1.103	1.139	1.047	0.625-1.488	0.14399	0.528
11 PFDoA	8.519	8.778	7.816	8.044	8.015	7.418	7.617	7.255	7.351	7.435	7.824	6.105-9.924	0.63665	4.007
4 10:2 FTS	1.910	1.850	2.054	2.316	2.453	2.276	2.364	2.328	2.414	2.379	2.234	1.773-3.132	0.22648	1.226
27 EtFOSA	1.304	0.917	0.918	1.015	1.068	1.020	1.100	1.038	1.107	1.132	1.061	0.730-1.405	0.11265	0.534
34 PFDOS	4.352	3.740	3.762	2.886	3.469	3.341	3.443	3.385	3.436	3.335	3.514	2.303-4.634	0.38855	1.734
24 PFTrDA	3.219	3.157	3.682	3.226	3.366	3.387	3.271	3.369	3.375	3.542	3.359	2.908-3.823	0.15244	1.683
23 PFTeDA	8.965	10.866	10.033	9.090	9.195	9.162	8.900	8.716	9.055	8.962	9.294	7.228-11.161	0.65558	4.597
35 PFHxDA	12.608	13.605	13.646	12.857	13.889	13.604	13.506	13.926	13.241	12.984	13.386	12.448-15.329	0.48009	6.944
36 PFODA	109.512	115.454	79.163	105.241	106.538	103.776	100.211	113.415	112.760	117.519	106.358	73.055-140.02(	11.16083	53.269

Report Date: 25-Jul-2021 09:48:01 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	950	1041	1029	876	998	880	903	986	804	810	Avg:A Wt:C2	928		RSD=9.3	
	102.4	112.2	111	94.4	107.5	94.9	97.3	106.3	86.6	87.3	Org:N Dep:R				
8 PFBA	1.146813	1.059173	1.042238	1.051551	0.909947	1.029134	1.006740	0.986184	0.990621	0.988340	Avg:A Wt:C2	1.021074		RSD=6.1	
	112.3	103.7	102.1	103	89.1	100.8	98.6	96.6	97	96.8	Org:N Dep:R				
D 50 13C5_PFPeA	923	1102	1079	974	1060	910	947	999	845	814	Avg:A Wt:C2	965		RSD=10.0	
	95.6	114.2	111.8	101	109.8	94.3	98.1	103.5	87.5	84.3	Org:N Dep:R				
21 PFPeA	1.197978	1.012791	1.056849	0.917932	0.899997	1.001852	0.992507	0.966523	0.933663	0.990988	Avg:A Wt:C2	0.997108		RSD=8.5	
	120.1	101.6	106	92.1	90.3	100.5	99.5	96.9	93.6	99.4	Org:N Dep:R				
D 44 13C3_PFBS	267	317	317	269	297	282	285	305	254	250	Avg:A Wt:C2	284		RSD=8.5	
	94	111.5	111.3	94.6	104.5	99.1	100.3	107.3	89.4	88	Org:N Dep:R				
7 PFBS	1.580666	1.398661	1.402926	1.488054	1.290474	1.322859	1.235271	1.272884	1.380991	1.396505	Avg:A Wt:C2	1.376929		RSD=7.5	
	114.8	101.6	101.9	108.1	93.7	96.1	89.7	92.4	100.3	101.4	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	2.029520	1.475642	1.742882	1.805585	1.758785	1.877358	1.930378	1.626018	1.635262	1.750316	Avg:A Wt:C2	1.763175		RSD=9.1	
	115.1	83.7	98.8	102.4	99.8	106.5	109.5	92.2	92.7	99.3	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	47.1942	54.8522	55.9664	42.7012	42.1506	42.1172	44.8436	49.2170	39.3464	40.7178	Avg:A Wt:C2	45.9107		RSD=12.7	
	102.8	119.5	121.9	93	91.8	91.7	97.7	107.2	85.7	88.7	Org:N Dep:R				
D 49 13C5_PFHxA	861	951	1000	826	864	832	818	865	728	719	Avg:A Wt:C2	846		RSD=10.2	
	101.7	112.4	118.2	97.6	102.1	98.3	96.6	102.2	86	84.9	Org:N Dep:R				
15 PFHxA	1.198144	0.986735	0.920777	0.895360	0.843057	0.942849	0.919120	0.985650	0.947218	0.936226	Avg:A Wt:C2	0.957513		RSD=9.9	
	125.1	103.1	96.2	93.5	88	98.5	96	102.9	98.9	97.8	Org:N Dep:R				
22 PFPeS	1.134294	1.086939	1.028873	1.093730	0.883939	0.983419	0.977044	1.001805	1.010647	1.011998	Avg:A Wt:C2	1.021269		RSD=6.9	
	111.1	106.4	100.7	107.1	86.6	96.3	95.7	98.1	99	99.1	Org:N Dep:R				
28 GenX	0.852201	0.853530	0.835546	0.795226	0.836315	0.743185	0.800094	0.773871	0.752296	0.762104	Avg:A Wt:C2	0.800437		RSD=5.2	
	106.5	106.6	104.4	99.3	104.5	92.8	100	96.7	94	95.2	Org:N Dep:R				
D 66 13C3_GenX	145	167	166	139	130	138	133	155	124	125	Avg:A Wt:C2	142		RSD=11.1	
	102.3	117.4	116.7	97.8	91.4	96.8	93.7	108.8	87	88	Org:N Dep:R				
13 PFHpA	0.954851	0.920540	0.820506	0.910998	0.795900	0.957770	0.900207	0.880841	0.854151	0.871575	Avg:A Wt:C2	0.886734		RSD=6.0	
	107.7	103.8	92.5	102.7	89.8	108	101.5	99.3	96.3	98.3	Org:N Dep:R				
D 47 13C4_PFHpA	882	956	1049	848	1038	812	871	903	770	748	Avg:A Wt:C2	888		RSD=11.5	
	99.4	107.7	118.2	95.6	116.9	91.5	98.1	101.7	86.7	84.3	Org:N Dep:R				
D 45 13C3_PFHxS	256	263	276	262	262	253	241	272	219	209	Avg:A Wt:C2	251		RSD=8.7	
	101.7	104.7	109.8	104.2	104.2	100.8	95.9	108.2	87.4	83.2	Org:N Dep:R				
14 PFHxS	1.213523	1.380104	1.177955	0.979047	1.077121	1.058400	1.092882	1.072833	1.070482	1.080769	Avg:A Wt:C2	1.120311		RSD=10.0	
	108.3	123.2	105.1	87.4	96.1	94.5	97.6	95.8	95.6	96.5	Org:N Dep:R				
29 ADONA	5.579970	5.588419	5.773344	4.866185	4.874659	4.889146	5.506762	4.979976	4.903456	5.194983	Avg:A Wt:C2	5.215690		RSD=6.9	
	107	107.1	110.7	93.3	93.5	93.7	105.6	95.5	94	99.6	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	39.5070	42.6430	44.2410	35.8804	35.8016	36.1596	35.4342	38.7242	30.3810	32.0692	Avg:A Wt:C2	37.0841		RSD=11.6	
	106.5	115	119.3	96.8	96.5	97.5	95.6	104.4	81.9	86.5	Org:N Dep:R				
2 6:2 FTS	4.091034	2.980045	2.437145	2.211402	2.036835	1.981750	1.774722	1.766019	2.022572	1.805377	Ln:A Wt:C2	1.878339	105	R^2=0.997	
	99.5	99.5	100.2	105.9	102.5	102.5	93.3	93.4	107.3	95.8	Org:N Dep:R			RSE=5.1	
D 53 13C8_PFOA	903	1013	930	810	991	800	823	901	697	673	Avg:A Wt:C2	854		RSD=13.4	
	105.7	118.6	108.9	94.8	116.1	93.7	96.4	105.5	81.6	78.8	Org:N Dep:R				
20 PFOA	0.985938	0.977420	1.052026	1.018179	0.790325	1.016598	0.948073	0.944526	0.999054	1.016250	Avg:A Wt:C2	0.974839		RSD=7.5	
	101.1	100.3	107.9	104.4	81.1	104.3	97.3	96.9	102.5	104.2	Org:N Dep:R				
12 PFHpS	1.138114	1.081066	1.026401	0.882795	0.941136	0.908291	0.909044	0.882044	0.922854	0.979797	Avg:A Wt:C2	0.967154		RSD=9.1	
	117.7	111.8	106.1	91.3	97.3	93.9	94	91.2	95.4	101.3	Org:N Dep:R				
D 54 13C8_PFOS	201	246	241	200	227	221	198	231	182	186	Avg:A Wt:C2	213		RSD=10.6	
	94.3	115	113	93.7	106.5	103.4	92.9	108.4	85.5	87.2	Org:N Dep:R				
18 PFOS	1.615397	1.222029	1.163891	1.127899	1.013758	1.035129	1.147065	1.060053	1.112581	1.125657	Ln:A Wt:C2	1.066137	22.9419	R^2=0.996	
	105.1	91.4	97.6	101.2	92.8	95.9	107.1	99.2	104.2	105.5	Org:N Dep:R			RSE=5.9	
D 56 13C9_PFNA	971	951	971	843	955	960	855	889	696	760	Avg:A Wt:C2	885		RSD=10.9	
	109.7	107.4	109.7	95.3	107.9	108.5	96.6	100.4	78.6	85.8	Org:N Dep:R				
17 PFNA	0.880468	0.906852	0.911943	0.794261	0.800623	0.782357	0.881177	0.833085	0.868302	0.826077	Avg:A Wt:C2	0.848514		RSD=5.6	
	103.8	106.9	107.5	93.6	94.4	92.2	103.8	98.2	102.3	97.4	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.050248	2.779960	2.809686	2.717631	2.436226	2.535250	2.768433	2.770505	2.975193	2.885626	Avg:A Wt:C2	2.772876		RSD=6.6	
	110	100.3	101.3	98	87.9	91.4	99.8	99.9	107.3	104.1	Org:N Dep:R				
D 55 13C8_PFOSA	409	449	474	382	392	406	400	419	342	335	Avg:A Wt:C2	401		RSD=10.7	
	102.1	112	118.3	95.3	97.7	101.3	99.9	104.5	85.2	83.7	Org:N Dep:R				
19 PFOSA	0.979673	0.984615	1.031199	0.994644	0.999436	1.007684	0.986103	0.907525	0.953988	1.038905	Avg:A Wt:C2	0.988377		RSD=3.8	
	99.1	99.6	104.3	100.6	101.1	102	99.8	91.8	96.5	105.1	Org:N Dep:R				
16 PFNS	0.980434	0.769781	1.031588	0.866133	0.766954	0.807540	1.049144	0.788487	0.844281	0.802401	Avg:A Wt:C2	0.870674		RSD=12.5	
	112.6	88.4	118.5	99.5	88.1	92.7	120.5	90.6	97	92.2	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	27.8110	32.3308	35.6072	29.1086	26.4296	28.9784	28.5850	30.4350	22.3080	23.9652	Avg:A Wt:C2	28.5559		RSD=13.5	
	97.4	113.2	124.7	101.9	92.6	101.5	100.1	106.6	78.1	83.9	Org:N Dep:R				
3 8:2 FTS	Disabled	1.484523	1.120144	1.591836	1.719264	1.623861	1.594461	1.479497	1.700315	1.625434	Avg:A Wt:C2	1.548815		RSD=11.6	
	Disabled	95.8	72.3	102.8	111	104.8	102.9	95.5	109.8	104.9	Org:N Dep:R				
D 51 13C6_PFDA	719	819	822	742	824	706	692	702	559	604	Avg:A Wt:C2	719		RSD=12.5	
	100	113.9	114.4	103.2	114.6	98.3	96.2	97.6	77.8	84	Org:N Dep:R				
10 PFDA	1.003998	1.029676	0.895466	0.858398	0.745678	0.886264	0.914353	0.945250	0.937233	0.860330	Avg:A Wt:C2	0.907664		RSD=8.8	
	110.6	113.4	98.7	94.6	82.2	97.6	100.7	104.1	103.3	94.8	Org:N Dep:R				
D 58 d3-MeFOSAA	181	191	199	167	172	169	176	201	165	168	Avg:A Wt:C2	179		RSD=7.6	
	101.3	106.5	111.2	93.1	96.3	94.6	98.5	112.4	92.2	93.9	Org:N Dep:R				
6 N-MeFOSAA	0.640302	0.763816	0.692958	0.760480	0.795089	0.786061	0.754875	0.730051	0.718919	0.724874	Avg:A Wt:C2	0.736743		RSD=6.3	
	86.9	103.7	94.1	103.2	107.9	106.7	102.5	99.1	97.6	98.4	Org:N Dep:R				
9 PFDS	1.154008	0.948948	0.889878	0.927011	0.836858	0.880502	0.930868	0.933472	0.886344	0.887976	Avg:A Wt:C2	0.927586		RSD=9.3	
	124.4	102.3	95.9	99.9	90.2	94.9	100.4	100.6	95.6	95.7	Org:N Dep:R				
D 52 13C7_PFUdA	696	769	788	677	741	635	644	674	557	543	Avg:A Wt:C2	673		RSD=12.2	
	103.5	114.4	117.2	100.7	110.3	94.3	95.8	100.2	82.8	80.8	Org:N Dep:R				
5 N-EtFOSAA	1.037323	1.079879	0.867912	0.838590	0.946677	0.919155	1.030310	0.979071	0.952913	0.938631	Avg:A Wt:C2	0.959046		RSD=7.9	
	108.2	112.6	90.5	87.4	98.7	95.8	107.4	102.1	99.4	97.9	Org:N Dep:R				
D 60 d5-EtFOSAA	171	177	198	164	166	163	151	160	133	137	Avg:A Wt:C2	162		RSD=11.6	
	105.5	109.1	122.2	101.3	102.5	100.6	93.3	98.7	82.4	84.4	Org:N Dep:R				
25 PFUdA	1.016106	0.876899	0.874664	1.022154	0.783580	0.893017	0.894509	0.839273	0.884614	0.898678	Avg:A Wt:C2	0.898349		RSD=8.1	
	113.1	97.6	97.4	113.8	87.2	99.4	99.6	93.4	98.5	100	Org:N Dep:R				
D 61 d7-MeFOSE	156	161	167	147	145	139	152	154	139	141	Avg:A Wt:C2	150		RSD=6.3	
	103.9	107.1	111.1	97.9	96.9	92.9	101.4	102.5	92.5	93.8	Org:N Dep:R				
32 MeFOSE	0.760372	1.209343	0.977559	0.869384	0.973337	0.912254	0.967018	0.985853	0.922259	0.921491	Avg:A Wt:C2	0.949887		RSD=11.9	
	80	127.3	102.9	91.5	102.5	96	101.8	103.8	97.1	97	Org:N Dep:R				
26 MeFOSA	0.876216	1.065571	1.086872	0.919038	1.003212	0.988993	1.069631	1.053974	1.111668	0.965690	Avg:A Wt:C2	1.014086		RSD=7.6	
	86.4	105.1	107.2	90.6	98.9	97.5	105.5	103.9	109.6	95.2	Org:N Dep:R				
D 57 d3-MeFOSA	54.3930	61.7040	69.0790	60.3740	60.7050	61.9170	59.5170	60.7900	48.9650	57.3380	Avg:A Wt:C2	59.4782		RSD=8.8	
	91.5	103.7	116.1	101.5	102.1	104.1	100.1	102.2	82.3	96.4	Org:N Dep:R				
31 11Cl-PF3OUDS	2.642467	2.270061	2.601265	2.486255	2.430307	2.248608	2.579621	2.421537	2.575656	2.564755	Avg:A Wt:C2	2.482053		RSD=5.6	
	106.5	91.5	104.8	100.2	97.9	90.6	103.9	97.6	103.8	103.3	Org:N Dep:R				
11 PFDoA	1.127561	0.978251	0.987515	1.038760	0.869028	0.934117	0.916309	0.912095	0.890305	0.891594	Avg:A Wt:C2	0.954553		RSD=8.4	
	118.1	102.5	103.5	108.8	91	97.9	96	95.6	93.3	93.4	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 62 d9-EtFOSE	146	151	152	142	135	140	140	162	134	132	Avg:A Wt:C2	143		RSD=6.6	
	101.9	105.3	106.1	98.7	94.5	97.3	97.7	113	93.4	92.1	Org:N Dep:R				
D 38 13C2_PFDoA	729	805	821	684	798	690	724	758	624	619	Avg:A Wt:C2	725		RSD=9.9	
	100.5	111	113.3	94.4	110.1	95.2	99.8	104.5	86	85.3	Org:N Dep:R				
4 10:2 FTS	2.426724	1.992820	1.961525	1.948776	2.262136	1.931901	2.144053	2.124346	2.349268	2.291521	Avg:A Wt:C2	2.143307		RSD=8.5	
	113.2	93	91.5	90.9	105.5	90.1	100	99.1	109.6	106.9	Org:N Dep:R				
33 EtFOSE	0.926756	0.844799	0.839146	0.764904	0.845000	0.780836	0.803994	0.757992	0.769115	0.812159	Avg:A Wt:C2	0.814470		RSD=6.3	
	113.8	103.7	103	93.9	103.7	95.9	98.7	93.1	94.4	99.7	Org:N Dep:R				
D 59 d5-EtFOSA	55.2900	63.7120	65.1060	56.3210	51.0360	53.8930	65.2340	59.0200	50.3220	54.5000	Avg:A Wt:C2	57.4434		RSD=9.7	
	96.3	110.9	113.3	98	88.8	93.8	113.6	102.7	87.6	94.9	Org:N Dep:R				
27 EtFOSA	1.358293	0.995260	0.986545	0.945402	1.121698	1.096803	0.866174	1.057157	1.047517	1.024664	Avg:A Wt:C2	1.049951		RSD=12.5	
	129.4	94.8	94	90	106.8	104.5	82.5	100.7	99.8	97.6	Org:N Dep:R				
34 PFDOS	0.958675	0.816395	0.869885	0.827601	0.817840	0.807037	0.894540	0.876747	0.894285	0.855082	Avg:A Wt:C2	0.861809		RSD=5.5	
	111.2	94.7	100.9	96	94.9	93.6	103.8	101.7	103.8	99.2	Org:N Dep:R				
24 PFTrDA	0.432147	0.378528	0.396174	0.389217	0.378403	0.401696	0.392792	0.408297	0.390939	0.414524	Avg:A Wt:C2	0.398272		RSD=4.2	
	108.5	95	99.5	97.7	95	100.9	98.6	102.5	98.2	104.1	Org:N Dep:R				
23 PFTeDA	0.927658	0.903478	0.850035	0.792872	0.720772	0.810338	0.803481	0.790766	0.775964	0.755555	Avg:A Wt:C2	0.813092		RSD=7.9	
	114.1	111.1	104.5	97.5	88.6	99.7	98.8	97.3	95.4	92.9	Org:N Dep:R				
D 42 13C2_PFTeDA	822	888	920	769	864	763	757	794	657	674	Avg:A Wt:C2	791		RSD=10.9	
	104	112.3	116.4	97.2	109.3	96.4	95.7	100.4	83.1	85.2	Org:N Dep:R				
35 PFHxDA	1.905047	1.693246	1.625163	1.480277	1.618115	1.609262	1.592655	1.492890	1.504416	1.556932	Avg:A Wt:C2	1.607800		RSD=7.7	
	118.5	105.3	101.1	92.1	100.6	100.1	99.1	92.9	93.6	96.8	Org:N Dep:R				
D 40 13C2_PFHxDA	431	461	472	416	383	392	383	449	352	334	Avg:A Wt:C2	407		RSD=11.4	
	105.7	113.2	116	102.1	94.1	96.3	94	110.2	86.4	81.9	Org:N Dep:R				
36 PFODA	1.230954	1.139357	1.155522	1.067024	1.206023	1.175109	1.201510	1.157251	1.227304	1.317428	Avg:A Wt:C2	1.187748		RSD=5.6	
	103.6	95.9	97.3	89.8	101.5	98.9	101.2	97.4	103.3	110.9	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	666581	745284	778057	688511	708463	648102	682214	670924	549041	567636	4.00
* 39 13C2_PFHxA	783044	932373	919191	782225	842604	859583	774741	866085	681533	696333	2.93
* 41 13C2_PFOA	907986	960441	1005225	822516	872798	847866	819629	876260	719647	730605	5.41
* 43 13C3_PFBA	909511	991323	1018602	870136	933046	835167	844857	915770	769676	784926	3.67
* 48 13C4_PFOS	234807	239606	252387	197038	216608	202921	211005	218690	179156	191479	5.08

13C2_PFDA ((|567636 - 666581| / (567636 + 666581)) / 2) * 100 = 4.01
13C2_PFHxA ((|696333 - 783044| / (696333 + 783044)) / 2) * 100 = 2.93
13C2_PFOA ((|730605 - 907986| / (730605 + 907986)) / 2) * 100 = 5.41
13C3_PFBA ((|784926 - 909511| / (784926 + 909511)) / 2) * 100 = 3.68
13C4_PFOS ((|191479 - 234807| / (191479 + 234807)) / 2) * 100 = 5.08

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	950390	1041161	1029443	876079	997866	880388	902879	986222	803630	810258	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	54496	110277	214585	460621	908005	1812074	4544820	9725960	11941390	16016213	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	922972	1101984	1079416	974464	1059542	909779	946666	998859	844615	813509	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	55285	111608	228156	447246	953585	1822928	4697864	9654204	11828789	16123551	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	267414	317199	316662	269037	297147	281833	285312	305059	254183	250392	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	18683	39219	78544	176951	338979	659155	1557774	3432613	4654585	6182232	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	4473	7560	18221	36006	69241	147701	404259	747459	901427	1331305	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	235971	274261	279832	213506	210753	210586	224218	246085	196732	203589	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	860865	951137	1000410	825717	864384	831703	818049	865011	728114	718849	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	783044	932373	919191	782225	842604	859583	774741	866085	681533	696333	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	51572	93852	184231	369657	728725	1568340	3759425	8525978	10345236	13460105	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	14226	32340	61121	138005	246375	519952	1307395	2866618	3614434	4753712	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	12384	28464	55393	110515	217113	408858	1064384	2392542	2790466	3810893	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	726589	833714	828695	694865	649017	687679	665162	772914	618211	625061	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	42114	88038	172164	386453	826040	1555833	3921306	7952483	9861805	13044212	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	882106	956373	1049133	848417	1037869	812216	871201	902828	769716	748313	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	255509	262968	275776	261757	261903	253350	240866	271798	219474	208898	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	14108	33026	59123	116604	256712	488025	1197733	2653504	3206971	4109022	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	67152	138434	299961	599940	1202640	2333645	6247305	12750418	15206440	20445575	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	197535	213215	221205	179402	179008	180798	177171	193621	151905	160346	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	7661	12047	20443	37610	69130	135866	298079	648315	873787	1097727	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	907986	960441	1005225	822516	872798	847866	819629	876260	719647	730605	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	903120	1012819	930191	809649	991369	800023	822974	900970	696627	673180	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	44521	98995	195717	412184	783504	1626603	3901197	8509896	10439518	13682377	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	13842	27064	53894	109993	234655	438140	1042239	2282303	2892307	3897064	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	201229	245511	241239	200063	227393	220723	198362	231281	182378	186054	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	15083	27842	52112	104702	213924	424053	1055758	2275179	2824511	3887077	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	234807	239606	252387	197038	216608	202921	211005	218690	179156	191479	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	971165	950828	971245	843131	954829	960112	855062	888521	696083	759834	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	42754	86226	177144	334833	764458	1502300	3767303	7402131	9066152	12553626	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	28603	63610	126343	253363	516310	1043072	2559048	5971931	7585684	10007484	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	409402	449069	474496	381972	391661	406095	400396	419164	341573	335466	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	20054	44216	97860	189963	391440	818431	1974159	3804017	4887849	6970346	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	9470	18143	47781	83175	167424	342226	998929	1750676	2217287	2866368	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	139055	161654	178036	145543	132148	144892	142925	152175	111540	119826	
3 8:2 FTS	Disabled	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	Disabled	4598	7642	22195	43531	90161	218317	431373	545063	746356	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	666581	745284	778057	688511	708463	648102	682214	670924	549041	567636	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	718667	818578	822058	741882	824029	706493	691532	701602	558988	603997	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	36077	84287	147225	318415	614460	1252278	3161521	6631896	7858528	10392733	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	907072	953305	995875	833000	862293	846681	881876	1005789	824966	840979	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	5808	14563	27604	63348	137120	266217	665706	1468554	1779252	2438414	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	11193	22459	41389	89392	183445	374701	890007	2081221	2337455	3185276	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	695971	769028	788120	677387	741490	634511	644207	674178	556901	543337	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	8860	19083	34358	68775	157181	299489	777981	1565364	1907754	2564622	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	854122	883571	989674	820127	830172	814577	755094	799413	667341	683075	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	35359	67436	137868	346197	581017	1133258	2881244	5658194	7389633	9765698	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	155871	160765	166793	146858	145483	139379	152142	153861	138826	140708	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	5926	19442	32610	63838	141604	254298	735620	1516844	1920503	2593223	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	2383	6575	15016	27743	60900	122471	318306	640711	816492	1107415	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	54393	61704	69079	60374	60705	61917	59517	60790	48965	57338	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	25045	52500	118226	234279	520582	935066	2410101	5275723	6637468	8990127	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	41082	78722	162213	355423	693572	1289042	3315371	6912677	8328230	11032454	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	146101	150888	152113	141555	135458	139555	140112	161978	133831	132021	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	728688	804722	821319	684322	798101	689979	723636	757890	623624	618693	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3253	6211	13466	27342	57635	107936	295407	623269	757812	1058795	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	6770	12747	25529	54138	114462	217939	563246	1227780	1543972	2144442	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	55290	63712	65106	56321	51036	53893	65234	59020	50322	54500	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3755	6341	12846	26623	57247	118220	282520	623934	790697	1116884	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	9337	19402	40627	80137	180020	344863	858823	1962861	2368181	3080009	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	15745	30461	65077	133175	302004	554324	1421192	3094443	3656987	5129262	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	38139	80235	156478	304751	622925	1236121	3039266	6276856	7652488	10184487	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	822264	888068	920421	768727	864247	762719	756525	793769	657461	673974	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41015	78070	153536	307623	620225	1262431	3047641	6701987	7943950	10389813	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	430593	461067	472371	415629	383301	392239	382712	448927	352028	333663	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	26502	52532	109167	221743	462270	921847	2299161	5195213	6480679	8791541	

Pace Environmental Services, LLC
Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.700	1.705	1.700	1.700	1.705	1.706	1.706	1.700	1.706	1.706	1.703	0.192
8 PFBA	1.706	1.705	1.706	1.706	1.705	1.706	1.706	1.706	1.706	1.706	1.706	0.028
D 50 13C5_PFPeA	2.056	2.055	2.056	2.056	2.055	2.056	2.056	2.056	2.056	2.056	2.055	0.015
21 PFPeA	2.056	2.055	2.056	2.056	2.055	2.056	2.056	2.056	2.056	2.056	2.055	0.015
D 44 13C3_PFBS	2.108	2.107	2.108	2.108	2.107	2.108	2.108	2.108	2.108	2.108	2.108	0.023
7 PFBS	2.118	2.118	2.108	2.108	2.118	2.108	2.108	2.108	2.108	2.108	2.111	0.218
1 4:2 FTS	2.379	2.379	2.388	2.380	2.379	2.379	2.388	2.380	2.380	2.388	2.381	0.183
D 63 13C2_4:2 FTS_2	2.388	2.379	2.380	2.380	2.388	2.379	2.380	2.380	2.380	2.379	2.381	0.154
D 49 13C5_PFHxA	2.423	2.422	2.423	2.423	2.422	2.423	2.423	2.423	2.423	2.423	2.422	0.021
* 39 13C2_PFHxA	2.423	2.422	2.423	2.423	2.422	2.423	2.423	2.423	2.423	2.423	2.422	0.021
15 PFHxA	2.423	2.422	2.423	2.423	2.422	2.423	2.423	2.423	2.423	2.423	2.422	0.021
22 PFPeS	2.458	2.457	2.449	2.458	2.457	2.458	2.458	2.458	2.449	2.457	2.455	0.139
28 GenX	2.536	2.544	2.536	2.536	2.544	2.545	2.536	2.545	2.536	2.544	2.540	0.171
D 66 13C3_GenX	2.536	2.535	2.545	2.536	2.544	2.536	2.536	2.545	2.536	2.544	2.539	0.172
13 PFHpA	2.801	2.792	2.801	2.801	2.800	2.801	2.801	2.801	2.801	2.800	2.799	0.090
D 47 13C4_PFHpA	2.792	2.801	2.792	2.801	2.800	2.801	2.801	2.801	2.801	2.800	2.798	0.134
D 45 13C3_PFHxS	2.809	2.810	2.810	2.810	2.818	2.818	2.809	2.818	2.818	2.818	2.813	0.165
14 PFHxS	2.809	2.810	2.810	2.810	2.818	2.809	2.809	2.818	2.810	2.818	2.812	0.149
29 ADONA	2.836	2.836	2.836	2.836	2.844	2.836	2.836	2.836	2.836	2.844	2.837	0.120
D 64 13C2_6:2 FTS_2	3.145	3.151	3.145	3.151	3.145	3.151	3.151	3.147	3.151	3.151	3.148	0.102
2 6:2 FTS	3.145	3.151	3.145	3.151	3.152	3.151	3.151	3.153	3.151	3.151	3.150	0.098
* 41 13C2_PFOA	3.170	3.177	3.170	3.177	3.171	3.177	3.177	3.178	3.177	3.183	3.175	0.123
D 53 13C8_PFOA	3.170	3.171	3.177	3.177	3.177	3.177	3.177	3.172	3.177	3.183	3.175	0.114
20 PFOA	3.170	3.177	3.170	3.177	3.177	3.177	3.177	3.178	3.183	3.183	3.176	0.133
12 PFHpS	3.183	3.177	3.177	3.183	3.183	3.183	3.183	3.185	3.183	3.189	3.182	0.119
D 54 13C8_PFOS	3.536	3.536	3.536	3.536	3.537	3.536	3.543	3.545	3.543	3.543	3.539	0.103
18 PFOS	3.543	3.536	3.543	3.536	3.537	3.543	3.543	3.545	3.543	3.550	3.542	0.121
* 48 13C4_PFOS	3.529	3.536	3.536	3.543	3.537	3.543	3.536	3.545	3.543	3.550	3.540	0.165
D 56 13C9_PFNA	3.536	3.543	3.543	3.543	3.544	3.543	3.543	3.545	3.543	3.550	3.543	0.087
17 PFNA	3.543	3.543	3.543	3.543	3.544	3.543	3.543	3.552	3.550	3.550	3.545	0.096
30 9Cl-PF3ONS	3.735	3.742	3.735	3.742	3.742	3.741	3.741	3.744	3.748	3.748	3.741	0.113
D 55 13C8_PFOSA	3.848	3.855	3.848	3.855	3.848	3.855	3.855	3.850	3.856	3.855	3.852	0.096
19 PFOSA	3.848	3.855	3.855	3.855	3.856	3.855	3.855	3.850	3.856	3.855	3.854	0.073

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.863	3.863	3.878	3.870	3.871	3.870	3.870	3.873	3.878	3.878	3.871	0.146
D 65 13C2_8:2 FTS_2	3.870	3.870	3.870	3.870	3.871	3.878	3.870	3.873	3.878	3.878	3.872	0.090
3 8:2 FTS	Disabled	3.870	3.870	3.870	3.871	3.870	3.878	3.873	3.878	3.878	3.873	0.092
* 37 13C2_PFDA	3.878	3.878	3.878	3.878	3.878	3.878	3.885	3.880	3.886	3.885	3.880	0.092
D 51 13C6_PFDA	3.878	3.878	3.878	3.878	3.878	3.878	3.878	3.880	3.886	3.885	3.879	0.082
10 PFDA	3.878	3.878	3.878	3.878	3.878	3.878	3.878	3.880	3.886	3.885	3.879	0.082
D 58 d3-MeFOSAA	4.029	4.030	4.030	4.030	4.030	4.029	4.030	4.032	4.030	4.039	4.030	0.079
6 N-MeFOSAA	4.020	4.030	4.030	4.040	4.030	4.039	4.039	4.032	4.040	4.039	4.033	0.169
9 PFDS	4.159	4.159	4.159	4.159	4.159	4.159	4.167	4.168	4.167	4.167	4.162	0.109
D 52 13C7_PFUdA	4.175	4.175	4.175	4.175	4.176	4.175	4.183	4.185	4.184	4.183	4.178	0.102
5 N-EtFOSAA	4.175	4.184	4.183	4.184	4.184	4.191	4.192	4.193	4.192	4.191	4.186	0.136
D 60 d5-EtFOSAA	4.175	4.175	4.175	4.184	4.184	4.183	4.183	4.185	4.184	4.191	4.182	0.122
25 PFUdA	4.175	4.175	4.175	4.184	4.184	4.183	4.183	4.185	4.184	4.183	4.181	0.094
D 61 d7-MeFOSE	4.282	4.282	4.282	4.282	4.283	4.282	4.282	4.283	4.282	4.282	4.282	0.011
32 MeFOSE	4.282	4.292	4.291	4.292	4.292	4.291	4.291	4.293	4.292	4.291	4.290	0.068
26 MeFOSA	4.301	4.301	4.301	4.301	4.301	4.301	4.301	4.302	4.301	4.301	4.300	0.016
D 57 d3-MeFOSA	4.301	4.301	4.301	4.301	4.301	4.301	4.301	4.302	4.301	4.301	4.300	0.016
31 11Cl-PF3OUDS	4.310	4.310	4.319	4.319	4.320	4.319	4.319	4.321	4.320	4.319	4.317	0.094
11 PFDoA	4.436	4.436	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.449	4.442	0.091
D 62 d9-EtFOSE	4.443	4.442	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.442	0.011
D 38 13C2_PFDoA	4.436	4.436	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.441	0.071
4 10:2 FTS	4.450	4.449	4.450	4.450	4.449	4.450	4.450	4.457	4.457	4.456	4.451	0.080
33 EtFOSE	4.450	4.449	4.456	4.450	4.456	4.456	4.457	4.457	4.457	4.456	4.454	0.078
D 59 d5-EtFOSA	4.456	4.464	4.465	4.457	4.464	4.465	4.465	4.465	4.465	4.464	4.463	0.077
27 EtFOSA	4.456	4.472	4.473	4.473	4.473	4.473	4.473	4.473	4.473	4.473	4.471	0.116
34 PFDOS	4.639	4.646	4.647	4.647	4.646	4.654	4.654	4.655	4.655	4.654	4.649	0.120
24 PFTrDA	4.669	4.669	4.670	4.670	4.677	4.677	4.677	4.678	4.677	4.677	4.674	0.085
23 PFTeDA	4.880	4.880	4.881	4.889	4.889	4.889	4.889	4.890	4.889	4.889	4.886	0.088
D 42 13C2_PFTeDA	4.880	4.880	4.881	4.881	4.889	4.889	4.889	4.890	4.889	4.889	4.885	0.094
35 PFHxDA	5.245	5.253	5.253	5.253	5.253	5.253	5.253	5.256	5.262	5.262	5.254	0.095
D 40 13C2_PFHxDA	5.245	5.244	5.245	5.245	5.253	5.253	5.253	5.256	5.254	5.253	5.250	0.091
36 PFODA	5.577	5.577	5.577	5.584	5.584	5.584	5.584	5.587	5.592	5.591	5.583	0.100

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221016.d
Injection Date: 22-Jul-2021 16:28:35 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 1 Auto Sampler: 1
Sample Info: ICAL 50_SVLC-1545A Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.705	3	950390	20	>100:1			1000.00	1024.31	95.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	3/0	54496	17	21:1			50.000	56.157		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	2	922972	15	>100:1			1000.00	956.27	87.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	2/0	55285	15	57:1			50.000	60.073		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	2	267414	15	>100:1			1000.00	940.20	90	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	3/1	18683	13	>100:1	Target = 3.65		44.200	50.740		
298.9 > 99	44	2.108	2.118		5625	15	27:1	3.32 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/-1	14226	13	83:1	Target = 3.30		46.900	52.091		M
349 > 99	44	2.458	2.457		3797	22	29:1	3.74 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	4	235971	18	>100:1			5000.00	5139.79	112	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.379	2.379	1/-3	4473	11	57:1	Target = 1.50		46.700	53.755		M
327 > 81	63	2.388	2.379		5239	10	36:1	0.85 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	4	860865	17	>100:1			1000.00	1017.06	99.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	4/0	51572	16	39:1	Target = 16.42		50.000	62.565		
313 > 119	49	2.423	2.422		2779	14	9.6:1	18.55 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	4	726589	17	>100:1			5000.00	5115.45	112	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.536	2.544	4/0	12384	15	35:1	Target = 0.77		100.00	106.47		
285 > 185	66	2.536	2.544		14215	15	37:1	0.87 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.792	2.800	4	882106	17	>100:1			1000.00	993.57	85	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	5/1	42114	18	72:1	Target = 3.14		50.000	53.841		
363 > 169	47	2.792	2.800		13726	22	31:1	3.06 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.809	2.818	5	255509	17	>100:1			1000.00	1017.03	97.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.809	2.818	0/-5	14108	25	70:1	Target = 3.31	0.12	45.500	49.286		
399 > 99	45	2.809	2.818		4820	23	25:1	2.92 (1.66-4.98)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	4/-1	67152	18	86:1	Target = 2.54		47.100	50.390		
377 > 85	45	2.836	2.844		29069	18	51:1	2.31 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	5/0	13842	25	>100:1	Target = 3.57		47.600	56.014		
449 > 99	45	3.177	3.183		3763	18	24:1	3.67 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.145	3.145	5	197535	22	>100:1			5000.00	5326.67	110.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.145	3.152	0/-5	7661	14	70:1	Target = 1.48		47.400	47.167		M
427 > 81	64	3.145	3.152		6629	18	71:1	1.15 (0.74-2.23)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.170	3.177	5	903120	21	>100:1			1000.00	1057.40	91.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.170	3.177	0/-5	44521	17	34:1	Target = 2.75		50.000	50.569		M
413 > 169	53	3.170	3.177		17784	20	34:1	2.50 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.537	4	201229	18	>100:1			1000.00	942.86	88.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.543	3.537	1/-3	15083	37	94:1	Target = 3.90	0.23	46.400	48.786		M
499 > 99	54	3.529	3.537		4717	34	31:1	3.19 (1.95-5.85)	0.14				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.735	3.742	4/0	28603	21	>100:1			46.600	51.261		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.863	3.871	4/0	9470	23	58:1	Target = 3.46		48.000	54.051		
549 > 99	54	3.863	3.871		2292	21	14:1	4.13 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	0/-4	11193	9	>100:1	Target = 3.36		48.200	59.966		M
599 > 99	54	4.151	4.159		3067	8	15:1	3.64 (1.68-5.04)					M
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.310	4.320	2/-2	25045	13	>100:1			47.100	50.144		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.639	4.646	-3/-7	9337	20	94:1	Target = 3.51		48.400	53.840		
699 > 99	54	4.647	4.646		2145	19		4.35 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.536	3.544	4	971165	19	>100:1			1000.00	1097.26	101.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	5/1	42754	21	88:1	Target = 4.84		50.000	51.883		
463 > 169	56	3.543	3.544		8135	28	39:1	5.25 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	5	409402	18	>100:1			1000.00	1021.13	104.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													a
498 > 78	55	3.848	3.856	0/-5	20054	17	25:1	Target = 42.34		50.000	49.560		
498>478	55	3.818	3.856		266	12		75.39 (21.17-63.51)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.870	3.871	4	139055	17	>100:1			5000.00	4869.58	105.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.870	3.871	4/0	2912	20	24:1	Target = 1.37		47.900	67.604		
527 > 81	65	3.863	3.871		2042	13	21:1	1.42 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.450	4.449	1/-3	3253	14	38:1	Target = 2.23		48.200	54.574		M
627 > 80	65	4.456	4.449		1703	20	20:1	1.91 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	4	718667	17	>100:1			1000.00	999.84	87.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	0/-4	36077	16	73:1	Target = 11.16		50.000	55.307		
513 > 169	51	3.870	3.878		3122	8	20:1	11.55 (5.58-16.75)					M
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.029	4.030	3	907072	16	>100:1			5000.00	5066.40	105.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.020	4.030	0/-3	5808	35	30:1	Target = 1.39	0.16	50.000	43.455		M
570 > 483	58	4.029	4.030		5486	26	29:1	1.05 (0.69-2.09)	0.25				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.175	4.176	2	695971	16	>100:1			1000.00	1034.88	93.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.175	4.184	2/0	35359	19	>100:1	Target = 10.79		50.000	56.554		
563 > 169	52	4.175	4.184		2565	19	13:1	13.78 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.175	4.184	2	854122	17	>100:1			5000.00	5274.20	102.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.175	4.184	0/-2	8860	35	60:1	Target = 1.79		50.000	54.081		M
584 > 526	60	4.175	4.184		4863	40	22:1	1.82 (0.89-2.69)	0.30				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	6	155871	15	>100:1			1000.00	1038.66	107.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.292	0/-6	5926	10	14:1			50.000	40.024		M
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	6	54393	17	>100:1			1000.00	914.50	89.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/-6	2383	10	10:1	Target = 1.04		50.000	43.202		M
512 > 219	57	4.301	4.301		3406	10	18:1	0.69 (0.52-1.57)					M
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.436	4.443	1	728688	18	>100:1			1000.00	1004.95	91.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.436	4.443	1/0	41082	15	22:1	Target = 7.82		50.000	59.062		
613 > 169	38	4.436	4.443		4822	15	41:1	8.51 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.669	4.677	0/-1	15745	17	70:1	Target = 3.35		50.000	54.253		
663 > 169	38	4.669	4.677		4890	19	35:1	3.21 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	5	146101	16	>100:1			1000.00	1019.11	107.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.450	4.456	0/-5	6770	14	33:1			50.000	56.893		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.456	4.464	5	55290	21	>100:1			1000.00	962.51	108.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.456	4.473	0/-5	3755	15	13:1	Target = 1.06		50.000	64.684		M
526 > 219	59	4.456	4.473		2878	12	24:1	1.30 (0.53-1.59)					M
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.880	4.889	-2	822264	19	>100:1			1000.00	1039.76	95.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.880	4.889	-1/1	38139	18	87:1	Target = 9.29		50.000	57.045		
713 > 169	42	4.880	4.889		4254	17	61:1	8.96 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.245	5.253	-4	430593	17	>100:1			1000.00	1057.31	112.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.245	5.253	-4/0	41015	15	5.1:1	Target = 13.38		50.000	59.244		
813 > 269	40	5.245	5.253		3253	20	67:1	12.60 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.577	5.584	-6/-2	26502	20	86:1	Target = 106.35		50.000	51.819		
913 > 319	40	5.577	5.584		242	26	25:1	109.51 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	3	666581	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	4	783044	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.170	3.171	5	907986	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	3	909511	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.529	3.537	4	234807	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221017.d
Injection Date: 22-Jul-2021 16:39:06 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 2 Auto Sampler: 2
Sample Info: ICAL 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.705	1	1041161	19	>100:1			1000.00	1122.14	104.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.705	0/-1	110277	18	45:1			100.00	103.73		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.055	0	1101984	15	>100:1			1000.00	1141.74	104	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.055	2.055	0/0	111608	16	>100:1			100.00	101.57		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.107	2.107	0	317199	15	>100:1			1000.00	1115.23	106.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	0/0	39219	15	>100:1	Target = 3.65		88.400	89.795		
298.9 > 99	44	2.107	2.118		11927	16	68:1	3.28 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.457	2.457	0/0	32340	17	>100:1	Target = 3.30		93.800	99.832		
349 > 99	44	2.457	2.457		9699	12	>100:1	3.33 (1.65-4.96)					M
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.379	2.388	0	274261	18	>100:1			5000.00	5973.80	130.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.379	2.379	0/0	7560	12	91:1	Target = 1.50		93.400	78.169		M
327 > 81	63	2.379	2.379		5352	10	25:1	1.41 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.422	2.422	0	951137	17	>100:1			1000.00	1123.71	110	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.422	2.422	0/0	93852	17	77:1	Target = 16.42		100.00	103.05		
313 > 119	49	2.414	2.422		5929	19	19:1	15.82 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.535	2.544	0	833714	16	>100:1			5000.00	5869.65	128.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.544	2.544	1/1	28464	16	92:1	Target = 0.77		200.00	213.27		
285 > 185	66	2.535	2.544		34133	19	>100:1	0.83 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	956373	18	>100:1			1000.00	1077.22	92.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.792	2.800	0/-1	88038	17	>100:1	Target = 3.14		100.00	103.81		
363 > 169	47	2.792	2.800		30121	15	88:1	2.92 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.810	2.818	1	262968	18	>100:1			1000.00	1046.72	100.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.810	2.818	1/0	33026	24	>100:1	Target = 3.31	0.16	91.000	112.10		
399 > 99	45	2.819	2.818		9697	23	52:1	3.40 (1.66-4.98)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	1/0	138434	17	>100:1	Target = 2.54		94.200	100.93		
377 > 85	45	2.836	2.844		56827	17	>100:1	2.43 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.177	3.183	0/-1	27064	29	>100:1	Target = 3.57		95.200	106.41		
449 > 99	45	3.183	3.183		6130	16	61:1	4.41 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	213215	22	>100:1			5000.00	5749.50	119.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	0/-1	12047	15	>100:1	Target = 1.48		94.800	94.333		M
427 > 81	64	3.151	3.152		8760	20	65:1	1.37 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.171	3.177	1	1012819	20	>100:1			1000.00	1185.84	102.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.177	3.177	1/0	98995	21	64:1	Target = 2.75		100.00	100.26		
413 > 169	53	3.177	3.177		33611	21	75:1	2.94 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.537	1	245511	19	>100:1			1000.00	1150.35	108	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.536	3.537	0/-1	27842	39	93:1	Target = 3.90	0.30	92.800	84.851		
499 > 99	54	3.543	3.537		6405	29	36:1	4.34 (1.95-5.85)	0.11				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.742	3.742	1/0	63610	19	>100:1			93.200	93.438		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.863	3.871	1/0	18143	23	>100:1	Target = 3.46		96.000	84.876		
549 > 99	54	3.870	3.871		6964	15	29:1	2.60 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	1/0	22459	13	>100:1	Target = 3.36		96.400	98.620		
599 > 99	54	4.159	4.159		7006	13		3.20 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.310	4.320	1/0	52500	22	>100:1			94.200	86.154		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.646	4.646	1/0	19402	16	>100:1	Target = 3.51		96.800	91.699		
699 > 99	54	4.646	4.646		5187	16	>100:1	3.74 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	1	950828	19	>100:1			1000.00	1074.28	99.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	1/0	86226	19	>100:1	Target = 4.84		100.00	106.88		
463 > 169	56	3.543	3.544		16963	16	>100:1	5.08 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	449069	18	>100:1			1000.00	1120.07	114.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/-1	44216	18	77:1	Target = 42.34		100.00	99.619		
498>478	55	3.841	3.856		1786	10	19:1	24.75 (21.17-63.51)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.870	3.871	1	161654	17	>100:1			5000.00	5660.97	122.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.870	3.871	0/-1	4598	11	24:1	Target = 1.37		95.800	91.823		M
527 > 81	65	3.863	3.871		4227	13	30:1	1.08 (0.68-2.05)					M
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.449	4.449	0/-1	6211	16	73:1	Target = 2.23		96.400	89.632		M
627 > 80	65	4.449	4.449		3356	23	24:1	1.85 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	1	818578	17	>100:1			1000.00	1138.84	99.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	1/0	84287	18	>100:1	Target = 11.16		100.00	113.44		
513 > 169	51	3.878	3.878		4829	22	28:1	17.45 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	1	953305	15	>100:1			5000.00	5324.63	110.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.030	4.030	0/-1	14563	24	54:1	Target = 1.39		100.00	103.67		M
570 > 483	58	4.030	4.030		10331	27	54:1	1.40 (0.69-2.09)	0.22				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.175	4.176	1	769028	16	>100:1			1000.00	1143.51	103.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.175	4.184	1/0	67436	16	>100:1	Target = 10.79		100.00	97.612		
563 > 169	52	4.175	4.184		7064	23	51:1	9.54 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.175	4.184	1	883571	17	>100:1			5000.00	5456.05	106.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.184	4.184	1/0	19083	27	>100:1	Target = 1.79	0.10	100.00	112.60		
584 > 526	60	4.184	4.184		10358	22	34:1	1.84 (0.89-2.69)	0.17				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	1	160765	14	>100:1			1000.00	1071.28	110.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.292	0/-1	19442	13	69:1			100.00	127.31		M
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	1	61704	15	>100:1			1000.00	1037.42	101.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/-1	6575	11	56:1	Target = 1.04		100.00	105.08		
512 > 219	57	4.301	4.301		6210	20	33:1	1.05 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.436	4.443	0	804722	17	>100:1			1000.00	1109.81	100.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.436	4.443	0/0	78722	18	70:1	Target = 7.82		100.00	102.48		
613 > 169	38	4.442	4.443		8968	25	88:1	8.77 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.669	4.677	0/0	30461	16	>100:1	Target = 3.35		100.00	95.043		
663 > 169	38	4.669	4.677		9648	14	>100:1	3.15 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.442	4.443	0	150888	17	>100:1			1000.00	1052.50	111.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.449	4.456	0/0	12747	14	70:1			100.00	103.72		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	1	63712	15	>100:1			1000.00	1109.13	124.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.472	4.473	0/-1	6341	12	37:1	Target = 1.06		100.00	94.791		M
526 > 219	59	4.464	4.473		6909	9	61:1	0.91 (0.53-1.59)					M
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.880	4.889	0	888068	19	>100:1			1000.00	1122.97	102.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.880	4.889	0/0	80235	18	>100:1	Target = 9.29		100.00	111.12		
713 > 169	42	4.880	4.889		7384	15	85:1	10.86 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.244	5.253	0	461067	16	>100:1			1000.00	1132.14	120.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/1	78070	15	9.3:1	Target = 13.38		100.00	105.31		
813 > 269	40	5.244	5.253		5738	15	>100:1	13.60 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.577	5.584	0/0	52532	21	>100:1	Target = 106.35		100.00	95.926		
913 > 319	40	5.569	5.584		455	15	35:1	115.45 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	1	745284	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.422	2.422	0	932373	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	960441	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.705	1.705	0	991323	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.536	3.537	1	239606	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221018.d
Injection Date: 22-Jul-2021 16:49:38 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 3 Auto Sampler: 3
Sample Info: ICAL 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.705	0	1029443	19	>100:1			1000.00	1109.51	103.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/1	214585	18	95:1			200.00	204.15		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	1079416	16	>100:1			1000.00	1118.36	101.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	228156	14	>100:1			200.00	211.98		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	316662	15	>100:1			1000.00	1113.35	106.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	78544	16	>100:1	Target = 3.65		176.80	180.14		
298.9 > 99	44	2.108	2.118		18978	14	97:1	4.13 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.449	2.457	0/-1	61121	19	>100:1	Target = 3.30		187.60	189.00		
349 > 99	44	2.449	2.457		20645	18	>100:1	2.96 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	279832	18	>100:1			5000.00	6095.14	132.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.379	1/1	18221	15	>100:1	Target = 1.50		186.80	184.65		
327 > 81	63	2.380	2.379		10914	9	80:1	1.66 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	1000410	18	>100:1			1000.00	1181.93	115.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	184231	15	>100:1	Target = 16.42		200.00	192.33		
313 > 119	49	2.423	2.422		11838	18	53:1	15.56 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.545	2.544	1	828695	17	>100:1			5000.00	5834.31	127.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.536	2.544	0/-1	55393	25	>100:1	Target = 0.77		400.00	417.54		
285 > 185	66	2.545	2.544		71330	16	>100:1	0.77 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.792	2.800	0	1049133	18	>100:1			1000.00	1181.70	101.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/1	172164	18	>100:1	Target = 3.14		200.00	185.06		
363 > 169	47	2.801	2.800		62577	18	>100:1	2.75 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.810	2.818	1	275776	16	>100:1			1000.00	1097.70	105.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.810	2.818	1/0	59123	27	>100:1	Target = 3.31	0.16	182.00	191.36		
399 > 99	45	2.810	2.818		17241	24	>100:1	3.42 (1.66-4.98)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	1/0	299961	18	>100:1	Target = 2.54		188.40	208.54		
377 > 85	45	2.836	2.844		91048	16	>100:1	3.29 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.177	3.183	0/-1	53894	20	>100:1	Target = 3.57		190.40	202.06		
449 > 99	45	3.177	3.183		15284	22	100:1	3.52 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.145	3.145	0	221205	20	>100:1			5000.00	5964.95	123.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.145	3.152	0/0	20443	19	>100:1	Target = 1.48		189.60	189.94		
427 > 81	64	3.158	3.152		14454	20	>100:1	1.41 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	1	930191	20	>100:1			1000.00	1089.10	93.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.170	3.177	0/-1	195717	21	>100:1	Target = 2.75		200.00	215.84		
413 > 169	53	3.170	3.177		78225	20	>100:1	2.50 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.537	1	241239	19	>100:1			1000.00	1130.33	106.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.543	3.537	1/0	52112	39	>100:1	Target = 3.90	0.28	185.60	181.10		M
499 > 99	54	3.536	3.537		12317	34	62:1	4.23 (1.95-5.85)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.735	3.742	0/-1	126343	20	>100:1			186.40	188.87		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.878	3.871	1/0	47781	16	>100:1	Target = 3.46		192.00	227.48		
549 > 99	54	3.863	3.871		11967	16	>100:1	3.99 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	0/-1	41389	17	>100:1	Target = 3.36		192.80	184.96		M
599 > 99	54	4.159	4.159		10999	23	49:1	3.76 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.319	4.320	1/0	118226	14	>100:1			188.40	197.45		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.647	4.646	1/0	40627	16	>100:1	Target = 3.51		193.60	195.41		
699 > 99	54	4.647	4.646		10798	16	>100:1	3.76 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	1	971245	19	>100:1			1000.00	1097.35	101.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	1/0	177144	19	>100:1	Target = 4.84		200.00	214.95		
463 > 169	56	3.550	3.544		36960	20	>100:1	4.79 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	0	474496	18	>100:1			1000.00	1183.49	121.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/0	97860	16	>100:1	Target = 42.34		200.00	208.67		
498>478	55	3.855	3.856		2412	17	26:1	40.57 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.870	3.871	1	178036	19	>100:1			5000.00	6234.65	134.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.870	3.871	0/-1	7642	11	36:1	Target = 1.37		191.60	138.57		M
527 > 81	65	3.863	3.871		8303	24		0.92 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.450	4.449	1/0	13466	16	>100:1	Target = 2.23		192.80	176.45		
627 > 80	65	4.443	4.449		6554	25	53:1	2.05 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	1	822058	17	>100:1			1000.00	1143.68	99.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	1/0	147225	17	>100:1	Target = 11.16		200.00	197.31		
513 > 169	51	3.878	3.878		15184	18	>100:1	9.69 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	1	995875	15	>100:1			5000.00	5562.41	115.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.030	4.030	0/-1	27604	33	>100:1	Target = 1.39	0.09	200.00	188.11		M
570 > 483	58	4.030	4.030		22371	29	88:1	1.23 (0.69-2.09)	0.29				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.175	4.176	1	788120	16	>100:1			1000.00	1171.90	106.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.175	4.184	1/0	137868	17	>100:1	Target = 10.79		200.00	194.73		
563 > 169	52	4.183	4.184		13094	17	65:1	10.52 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.175	4.184	1	989674	16	>100:1			5000.00	6111.24	119.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.183	4.184	0/-1	34358	33	>100:1	Target = 1.79	0.06	200.00	180.99		M
584 > 526	60	4.192	4.184		19116	36	56:1	1.79 (0.89-2.69)	0.20				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	1	166793	14	>100:1			1000.00	1111.45	114.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.292	0/-1	32610	11	97:1			200.00	205.83		M
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	1	69079	17	>100:1			1000.00	1161.42	113.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/-1	15016	12	47:1	Target = 1.04		200.00	214.35		M
512 > 219	57	4.301	4.301		12557	13	74:1	1.19 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	821319	17	>100:1			1000.00	1132.70	102.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	162213	17	72:1	Target = 7.82		200.00	206.91		
613 > 169	38	4.443	4.443		20752	20	>100:1	7.81 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.670	4.677	1/0	65077	18	>100:1	Target = 3.35		200.00	198.95		
663 > 169	38	4.670	4.677		17674	16	>100:1	3.68 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	152113	16	>100:1			1000.00	1061.05	112.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	25529	14	>100:1			200.00	206.06		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	65106	17	>100:1			1000.00	1133.39	127.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	12846	17	97:1	Target = 1.06		200.00	187.92		
526 > 219	59	4.465	4.473		13993	14	77:1	0.91 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.881	4.889	1	920421	18	>100:1			1000.00	1163.89	106.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.881	4.889	1/0	156478	19	>100:1	Target = 9.29		200.00	209.09		
713 > 169	42	4.881	4.889		15595	16	>100:1	10.03 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.245	5.253	1	472371	16	>100:1			1000.00	1159.90	123.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/0	153536	15	14:1	Target = 13.38		200.00	202.16		
813 > 269	40	5.253	5.253		11251	22	>100:1	13.64 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.577	5.584	1/0	109167	21	13:1	Target = 106.35		200.00	194.57		
913 > 319	40	5.577	5.584		1379	24	74:1	79.16 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	1	778057	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	919191	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.170	3.171	0	1005225	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.705	0	1018602	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.536	3.537	1	252387	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221019.d
Injection Date: 22-Jul-2021 17:00:12 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 4 Auto Sampler: 4
Sample Info: ICAL 500_SVLC-1548 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.705	0	876079	19	>100:1			1000.00	944.22	87.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/1	460621	20	>100:1			500.00	514.92		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	974464	16	>100:1			1000.00	1009.62	92	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	447246	15	>100:1			500.00	460.30		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	269037	15	>100:1			1000.00	945.90	90.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	176951	17	>100:1	Target = 3.65		442.00	477.67		
298.9 > 99	44	2.108	2.118		42770	16	>100:1	4.13 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/0	138005	17	>100:1	Target = 3.30		469.00	502.28		
349 > 99	44	2.449	2.457		40800	18	>100:1	3.38 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	213506	18	>100:1			5000.00	4650.47	101.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.380	2.379	1/1	36006	16	>100:1	Target = 1.50		467.00	478.23		M
327 > 81	63	2.380	2.379		23967	12	>100:1	1.50 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	825717	18	>100:1			1000.00	975.54	95.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	369657	19	>100:1	Target = 16.42		500.00	467.54		
313 > 119	49	2.423	2.422		25159	17	>100:1	14.69 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	0	694865	18	>100:1			5000.00	4892.10	107.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.536	2.544	0/0	110515	18	>100:1	Target = 0.77		1000.00	993.49		
285 > 185	66	2.536	2.544		143076	17	>100:1	0.77 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	848417	18	>100:1			1000.00	955.62	81.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/0	386453	18	>100:1	Target = 3.14		500.00	513.68		
363 > 169	47	2.801	2.800		125820	23	>100:1	3.07 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.810	2.818	1	261757	17	>100:1			1000.00	1041.90	99.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.810	2.818	1/0	116604	27	>100:1	Target = 3.31	0.16	455.00	397.63		
399 > 99	45	2.810	2.818		35750	24	>100:1	3.26 (1.66-4.98)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	1/0	599940	18	>100:1	Target = 2.54		471.00	439.44		
377 > 85	45	2.836	2.844		231733	19	>100:1	2.58 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	1/0	109993	22	>100:1	Target = 3.57		476.00	434.48		
449 > 99	45	3.177	3.183		34212	20	>100:1	3.21 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	179402	21	>100:1			5000.00	4837.70	100.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	1/0	37610	22	>100:1	Target = 1.48		474.00	501.98		
427 > 81	64	3.158	3.152		23127	21	>100:1	1.62 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	1	809649	21	>100:1			1000.00	947.96	81.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.177	3.177	1/0	412184	21	>100:1	Target = 2.75		500.00	522.23		
413 > 169	53	3.171	3.177		131797	22	>100:1	3.12 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.537	1	200063	18	>100:1			1000.00	937.40	88	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.536	3.537	0/-1	104702	38	>100:1	Target = 3.90	0.25	464.00	469.36		
499 > 99	54	3.536	3.537		28493	39	>100:1	3.67 (1.95-5.85)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.742	3.742	1/0	253363	19	>100:1			466.00	456.72		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.870	3.871	1/0	83175	18	>100:1	Target = 3.46		480.00	477.50		
549 > 99	54	3.870	3.871		26886	19		3.09 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	1/0	89392	15	>100:1	Target = 3.36		482.00	481.70		
599 > 99	54	4.159	4.159		28907	21	>100:1	3.09 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.319	4.320	1/0	234279	15	>100:1			471.00	471.80		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.647	4.646	1/0	80137	15	>100:1	Target = 3.51		484.00	464.79		
699 > 99	54	4.655	4.646		27767	17	>100:1	2.88 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	1	843131	19	>100:1			1000.00	952.60	88.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	1/0	334833	19	>100:1	Target = 4.84		500.00	468.03		
463 > 169	56	3.543	3.544		71163	18	>100:1	4.70 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	381972	18	>100:1			1000.00	952.72	97.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	1/0	189963	20	>100:1	Target = 42.34		500.00	503.17		
498>478	55	3.848	3.856		4826	14	45:1	39.36 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.870	3.871	1	145543	18	>100:1			5000.00	5096.78	110.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.870	3.871	1/0	22195	24	89:1	Target = 1.37		479.00	492.31		
527 > 81	65	3.870	3.871		17357	23	>100:1	1.27 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.450	4.449	1/0	27342	16	>100:1	Target = 2.23		482.00	438.25		
627 > 80	65	4.450	4.449		11805	16	>100:1	2.31 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	1	741882	17	>100:1			1000.00	1032.14	90	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	1/0	318415	17	>100:1	Target = 11.16		500.00	472.86		
513 > 169	51	3.878	3.878		27849	18	>100:1	11.43 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	1	833000	16	>100:1			5000.00	4652.68	96.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.040	4.030	1/0	63348	36	>100:1	Target = 1.39	0.08	500.00	516.11		M
570 > 483	58	4.030	4.030		42611	28	>100:1	1.48 (0.69-2.09)	0.20				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.175	4.176	1	677387	16	>100:1			1000.00	1007.25	91.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.184	4.184	1/0	346197	16	>100:1	Target = 10.79		500.00	568.91		
563 > 169	52	4.184	4.184		25863	16	>100:1	13.38 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.184	4.184	1	820127	17	>100:1			5000.00	5064.28	98.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.184	4.184	0/-1	68775	32	>100:1	Target = 1.79		500.00	437.20		M
584 > 526	60	4.184	4.184		43484	38	>100:1	1.58 (0.89-2.69)	0.26				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	1	146858	15	>100:1			1000.00	978.61	100.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.292	1/0	63838	14	>100:1			500.00	457.62		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	1	60374	20	>100:1			1000.00	1015.06	99.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/-1	27743	14	54:1	Target = 1.04		500.00	453.14		M
512 > 219	57	4.301	4.301		29686	13	>100:1	0.93 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	684322	17	>100:1			1000.00	943.77	85.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	355423	17	>100:1	Target = 7.82		500.00	544.11		
613 > 169	38	4.436	4.443		44184	16	>100:1	8.04 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.670	4.677	1/0	133175	19	>100:1	Target = 3.35		500.00	488.63		
663 > 169	38	4.670	4.677		41280	17	>100:1	3.22 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	141555	16	>100:1			1000.00	987.40	104.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.450	4.456	0/-1	54138	15	>100:1			500.00	469.57		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.457	4.464	0	56321	16	>100:1			1000.00	980.46	110.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/1	26623	18	>100:1	Target = 1.06		500.00	450.21		
526 > 219	59	4.473	4.473		26225	16	>100:1	1.01 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.881	4.889	1	768727	18	>100:1			1000.00	972.07	88.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	304751	19	>100:1	Target = 9.29		500.00	487.57		
713 > 169	42	4.881	4.889		33525	21	>100:1	9.09 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.245	5.253	1	415629	17	>100:1			1000.00	1020.57	108.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/0	307623	17	38:1	Target = 13.38		500.00	460.34		
813 > 269	40	5.253	5.253		23926	16	>100:1	12.85 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.584	5.584	1/0	221743	21	37:1	Target = 106.35		500.00	449.18		
913 > 319	40	5.577	5.584		2107	22	91:1	105.24 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	1	688511	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	782225	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	822516	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.700	1.705	0	870136	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	197038	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221020.d
Injection Date: 22-Jul-2021 17:10:44 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 5 Auto Sampler: 5
Sample Info: ICAL 1000_SVLC-1549 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.705	1	997866	20	>100:1			1000.00	1075.48	100	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.705	0/-1	908005	19	>100:1			1000.00	891.17		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.055	0	1059542	15	>100:1			1000.00	1097.77	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.055	2.055	0/0	953585	15	>100:1			1000.00	902.61		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.107	2.107	0	297147	15	>100:1			1000.00	1044.73	100	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.118	2.118	1/1	338979	15	>100:1	Target = 3.65		884.00	828.49		
298.9 > 99	44	2.118	2.118		90940	16	>100:1	3.72 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.457	2.457	1/1	246375	20	>100:1	Target = 3.30		938.00	811.87		
349 > 99	44	2.457	2.457		80014	18	>100:1	3.07 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	1	210753	17	>100:1			5000.00	4590.50	100	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.379	2.379	0/-1	69241	19	>100:1	Target = 1.50		934.00	931.67		
327 > 81	63	2.388	2.379		49603	19	>100:1	1.39 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.422	2.422	0	864384	18	>100:1			1000.00	1021.22	100	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.422	2.422	0/0	728725	18	>100:1	Target = 16.42		1000.00	880.46		
313 > 119	49	2.422	2.422		47551	18	>100:1	15.32 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.544	2.544	1	649017	18	>100:1			5000.00	4569.31	100	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.544	2.544	1/0	217113	18	>100:1	Target = 0.77		2000.00	2089.65		
285 > 185	66	2.544	2.544		271488	19	>100:1	0.79 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.800	2.800	1	1037869	18	>100:1			1000.00	1169.01	100	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.800	2.800	1/0	826040	17	>100:1	Target = 3.14		1000.00	897.56		
363 > 169	47	2.800	2.800		243084	17	>100:1	3.39 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	261903	20	>100:1			1000.00	1042.48	100	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	0/-1	256712	26	>100:1	Target = 3.31	0.15	910.00	874.92		
399 > 99	45	2.818	2.818		74159	26	>100:1	3.46 (1.66-4.98)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.844	2.844	1/0	1202640	18	>100:1	Target = 2.54		942.00	880.41		
377 > 85	45	2.844	2.844		474980	18	>100:1	2.53 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	1/0	234655	21	>100:1	Target = 3.57		952.00	926.39		
449 > 99	45	3.177	3.183		62769	20	>100:1	3.73 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.145	3.145	0	179008	20	>100:1			5000.00	4827.08	100	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.152	3.152	1/1	69130	20	>100:1	Target = 1.48		948.00	971.92		
427 > 81	64	3.152	3.152		48793	20	>100:1	1.41 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	1	991369	22	>100:1			1000.00	1160.73	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.177	3.177	1/0	783504	22	>100:1	Target = 2.75		1000.00	810.72		
413 > 169	53	3.177	3.177		298292	22	>100:1	2.62 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.537	3.537	1	227393	21	>100:1			1000.00	1065.46	100	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.537	3.537	0/-1	213924	40	>100:1	Target = 3.90	0.25	928.00	860.89		
499 > 99	54	3.537	3.537		56881	37	>100:1	3.76 (1.95-5.85)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.742	3.742	1/0	516310	20	>100:1			932.00	818.85		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.871	3.871	1/0	167424	20	>100:1	Target = 3.46		960.00	845.64		
549 > 99	54	3.871	3.871		51993	17	>100:1	3.22 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	1/0	183445	17	>100:1	Target = 3.36		964.00	869.71		
599 > 99	54	4.167	4.159		48486	15	>100:1	3.78 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.320	4.320	1/0	520582	15	>100:1			942.00	922.36		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.646	4.646	1/0	180020	17	>100:1	Target = 3.51		968.00	918.61		
699 > 99	54	4.646	4.646		51887	16		3.46 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.544	3.544	1	954829	19	>100:1			1000.00	1078.80	100	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.544	3.544	1/0	764458	20	>100:1	Target = 4.84		1000.00	943.56		
463 > 169	56	3.544	3.544		158543	19	>100:1	4.82 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	0	391661	20	>100:1			1000.00	976.88	100	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.856	1/1	391440	18	>100:1	Target = 42.34		1000.00	1011.19		
498>478	55	3.863	3.856		8912	18	81:1	43.92 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.871	3.871	1	132148	21	>100:1			5000.00	4627.70	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.871	3.871	1/0	43531	16	>100:1	Target = 1.37		958.00	1063.43		
527 > 81	65	3.871	3.871		32544	18	>100:1	1.33 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.449	4.449	1/0	57635	17	>100:1	Target = 2.23		964.00	1017.45		
627 > 80	65	4.449	4.449		23490	15	>100:1	2.45 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	1	824029	19	>100:1			1000.00	1146.42	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	1/0	614460	18	>100:1	Target = 11.16		1000.00	821.53		
513 > 169	51	3.878	3.878		64885	19	>100:1	9.46 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	1	862293	16	>100:1			5000.00	4816.29	100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.030	4.030	0/-1	137120	33	>100:1	Target = 1.39	0.08	1000.00	1079.20		M
570 > 483	58	4.030	4.030		96287	30	>100:1	1.42 (0.69-2.09)	0.07				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.176	4.176	1	741490	17	>100:1			1000.00	1102.57	100	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.184	4.184	1/0	581017	15	>100:1	Target = 10.79		1000.00	872.24		
563 > 169	52	4.176	4.184		56661	18	>100:1	10.25 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.184	4.184	1	830172	17	>100:1			5000.00	5126.31	100	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.184	4.184	0/-1	157181	32	>100:1	Target = 1.79		1000.00	987.10		M
584 > 526	60	4.192	4.184		76080	31	>100:1	2.06 (0.89-2.69)	0.21				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.283	4.283	1	145483	14	>100:1			1000.00	969.44	100	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.292	1/0	141604	15	>100:1			1000.00	1024.69		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	1	60705	13	>100:1			1000.00	1020.63	100	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/-1	60900	15	42:1	Target = 1.04		1000.00	989.28		
512 > 219	57	4.301	4.301		57587	17	>100:1	1.05 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	798101	17	>100:1			1000.00	1100.68	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	693572	17	>100:1	Target = 7.82		1000.00	910.40		
613 > 169	38	4.443	4.443		86533	18	>100:1	8.01 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.677	4.677	1/0	302004	16	>100:1	Target = 3.35		1000.00	950.11		
663 > 169	38	4.677	4.677		89717	15	>100:1	3.36 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	135458	15	>100:1			1000.00	944.87	100	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	114462	22	>100:1			1000.00	1037.48		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	1	51036	15	>100:1			1000.00	888.46	100	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	0/-1	57247	15	>100:1	Target = 1.06		1000.00	1068.33		
526 > 219	59	4.473	4.473		53587	14	>100:1	1.06 (0.53-1.59)					M
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	864247	18	>100:1			1000.00	1092.85	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	622925	18	>100:1	Target = 9.29		1000.00	886.46		
713 > 169	42	4.889	4.889		67743	18	>100:1	9.19 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.253	5.253	1	383301	17	>100:1			1000.00	941.19	100	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/0	620225	17	74:1	Target = 13.38		1000.00	1006.42		
813 > 269	40	5.253	5.253		44655	16	>100:1	13.88 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.584	5.584	1/0	462270	20	75:1	Target = 106.35		1000.00	1015.39		
913 > 319	40	5.584	5.584		4339	22	>100:1	106.53 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	1	708463	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.422	2.422	0	842604	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.171	3.171	0	872798	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.705	1.705	1	933046	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.537	3.537	1	216608	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221021.d
Injection Date: 22-Jul-2021 17:21:19 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 6 Auto Sampler: 6
Sample Info: ICAL 2000_SVLC-1550 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	880388	20	>100:1			1000.00	948.87	88.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/0	1812074	20	>100:1			2000.00	2015.79		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	909779	16	>100:1			1000.00	942.60	85.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	1822928	15	>100:1			2000.00	2009.52		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	281833	15	>100:1			1000.00	990.89	94.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	659155	15	>100:1	Target = 3.65		1768.00	1698.57		
298.9 > 99	44	2.108	2.118		179544	15	>100:1	3.67 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/0	519952	17	>100:1	Target = 3.30		1876.00	1806.47		
349 > 99	44	2.458	2.457		162794	17	>100:1	3.19 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.379	2.388	0	210586	17	>100:1			5000.00	4586.87	99.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.379	2.379	1/1	147701	17	>100:1	Target = 1.50		1868.00	1988.97		
327 > 81	63	2.379	2.379		90842	18	>100:1	1.62 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	831703	18	>100:1			1000.00	982.61	96.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	1568340	18	>100:1	Target = 16.42		2000.00	1969.37		
313 > 119	49	2.423	2.422		89623	21	>100:1	17.49 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	0	687679	17	>100:1			5000.00	4841.51	106	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.545	2.544	1/1	408858	17	>100:1	Target = 0.77		4000.00	3713.90		
285 > 185	66	2.536	2.544		558476	17	>100:1	0.73 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	812216	18	>100:1			1000.00	914.85	78.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/0	1555833	18	>100:1	Target = 3.14		2000.00	2160.22		
363 > 169	47	2.801	2.800		461137	19	>100:1	3.37 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	253350	19	>100:1			1000.00	1008.44	96.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.809	2.818	0/-1	488025	26	>100:1	Target = 3.31	0.19	1820.00	1719.42		
399 > 99	45	2.809	2.818		143168	25	>100:1	3.40 (1.66-4.98)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	0/-1	2333645	18	>100:1	Target = 2.54		1884.00	1766.05		
377 > 85	45	2.836	2.844		935402	17	>100:1	2.49 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	0/-1	438140	22	>100:1	Target = 3.57		1904.00	1788.12		
449 > 99	45	3.183	3.183		135229	21	>100:1	3.23 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	180798	21	>100:1			5000.00	4875.35	101	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	0/-1	135866	23	>100:1	Target = 1.48		1896.00	1944.31		
427 > 81	64	3.151	3.152		81360	19	>100:1	1.66 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	0	800023	22	>100:1			1000.00	936.69	80.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.177	3.177	0/0	1626603	22	>100:1	Target = 2.75		2000.00	2085.67		
413 > 169	53	3.183	3.177		589917	23	>100:1	2.75 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.537	0	220723	21	>100:1			1000.00	1034.20	97.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.543	3.537	1/1	424053	39	>100:1	Target = 3.90	0.29	1856.00	1780.50		
499 > 99	54	3.543	3.537		115033	39	>100:1	3.68 (1.95-5.85)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.741	3.742	0/0	1043072	20	>100:1			1864.00	1704.26		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.870	3.871	0/0	342226	18	>100:1	Target = 3.46		1920.00	1780.78		
549 > 99	54	3.870	3.871		97076	18	>100:1	3.52 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.159	4.159	0/0	374701	16	>100:1	Target = 3.36		1928.00	1830.13		
599 > 99	54	4.159	4.159		113101	16	>100:1	3.31 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.319	4.320	0/0	935066	15	>100:1			1884.00	1706.80		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.654	4.646	1/1	344863	16	>100:1	Target = 3.51		1936.00	1812.96		
699 > 99	54	4.647	4.646		103215	17	>100:1	3.34 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	0	960112	19	>100:1			1000.00	1084.77	100.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	0/0	1502300	19	>100:1	Target = 4.84		2000.00	1844.06		
463 > 169	56	3.543	3.544		298811	19	>100:1	5.02 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	406095	18	>100:1			1000.00	1012.88	103.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/-1	818431	19	>100:1	Target = 42.34		2000.00	2039.07		
498>478	55	3.855	3.856		19658	16	>100:1	41.63 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.878	3.871	1	144892	18	>100:1			5000.00	5073.98	109.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.870	3.871	0/-1	90161	18	>100:1	Target = 1.37		1916.00	2008.84		
527 > 81	65	3.870	3.871		54495	18	>100:1	1.65 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.450	4.449	1/0	107936	16	>100:1	Target = 2.23		1928.00	1737.83		
627 > 80	65	4.450	4.449		47417	18	>100:1	2.27 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	0	706493	17	>100:1			1000.00	982.90	85.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	0/0	1252278	18	>100:1	Target = 11.16		2000.00	1952.84		
513 > 169	51	3.878	3.878		120273	17	>100:1	10.41 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.029	4.030	0	846681	15	>100:1			5000.00	4729.09	98.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.039	4.030	1/1	266217	33	>100:1	Target = 1.39	0.08	2000.00	2133.88		M
570 > 483	58	4.039	4.030		178287	32	>100:1	1.49 (0.69-2.09)	0.22				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.175	4.176	0	634511	17	>100:1			1000.00	943.49	85.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.183	4.184	0/0	1133258	17	>100:1	Target = 10.79		2000.00	1988.13		
563 > 169	52	4.183	4.184		118550	17	>100:1	9.55 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.183	4.184	0	814577	17	>100:1			5000.00	5030.01	98.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.191	4.184	1/1	299489	34	>100:1	Target = 1.79		2000.00	1916.81		M
584 > 526	60	4.191	4.184		173678	34	>100:1	1.72 (0.89-2.69)	0.25				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	0	139379	15	>100:1			1000.00	928.77	95.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.292	0/0	254298	15	>100:1			2000.00	1920.76		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	61917	13	>100:1			1000.00	1041.00	102	M
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/0	122471	12	50:1	Target = 1.04		2000.00	1950.51		
512 > 219	57	4.301	4.301		114646	18	>100:1	1.06 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	689979	17	>100:1			1000.00	951.57	86.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	1289042	17	>100:1	Target = 7.82		2000.00	1957.18		
613 > 169	38	4.443	4.443		173752	18	>100:1	7.41 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.677	4.677	1/0	554324	16	>100:1	Target = 3.35		2000.00	2017.20		
663 > 169	38	4.677	4.677		163650	16	>100:1	3.38 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	139555	19	>100:1			1000.00	973.45	103	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	217939	16	>100:1			2000.00	1917.41		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	53893	16	>100:1			1000.00	938.19	105.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	118220	15	>100:1	Target = 1.06		2000.00	2089.25		
526 > 219	59	4.473	4.473		115806	17	>100:1	1.02 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	762719	18	>100:1			1000.00	964.47	88.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	1236121	18	>100:1	Target = 9.29		2000.00	1993.23		
713 > 169	42	4.889	4.889		134907	18	>100:1	9.16 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.253	5.253	1	392239	17	>100:1			1000.00	963.13	102.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/0	1262431	17	>100:1	Target = 13.38		2000.00	2001.82		
813 > 269	40	5.253	5.253		92792	17	>100:1	13.60 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.584	5.584	1/0	921847	21	>100:1	Target = 106.35		2000.00	1978.72		
913 > 319	40	5.584	5.584		8883	22	>100:1	103.77 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.878	3.878	0	648102	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	859583	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	847866	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	835167	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	202921	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221022.d
Injection Date: 22-Jul-2021 17:31:51 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 7 Auto Sampler: 7
Sample Info: ICAL 5000_SVLC-1551 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	902879	20	>100:1			1000.00	973.11	90.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/0	4544820	20	>100:1			5000.00	4929.81		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	946666	16	>100:1			1000.00	980.82	89.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	4697864	15	>100:1			5000.00	4976.93		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	285312	15	>100:1			1000.00	1003.12	96	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	1557774	15	>100:1	Target = 3.65		4420.00	3965.27		
298.9 > 99	44	2.108	2.118		466798	15	>100:1	3.33 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/0	1307395	17	>100:1	Target = 3.30		4690.00	4486.90		
349 > 99	44	2.458	2.457		404325	17	>100:1	3.23 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	224218	18	>100:1			5000.00	4883.79	106.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.379	1/1	404259	17	>100:1	Target = 1.50		4670.00	5112.86		
327 > 81	63	2.380	2.379		218976	17	>100:1	1.84 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	818049	17	>100:1			1000.00	966.48	94.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	3759425	18	>100:1	Target = 16.42		5000.00	4799.51		
313 > 119	49	2.423	2.422		221269	19	>100:1	16.99 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	0	665162	17	>100:1			5000.00	4682.98	102.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.536	2.544	0/0	1064384	17	>100:1	Target = 0.77		10000	9995.72		
285 > 185	66	2.536	2.544		1460458	17	>100:1	0.72 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	871201	18	>100:1			1000.00	981.28	83.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/0	3921306	18	>100:1	Target = 3.14		5000.00	5075.97		
363 > 169	47	2.801	2.800		1139070	18	>100:1	3.44 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.809	2.818	0	240866	18	>100:1			1000.00	958.75	92	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.809	2.818	0/0	1197733	25	>100:1	Target = 3.31	0.16	4550.00	4438.60		
399 > 99	45	2.818	2.818		349276	25	>100:1	3.42 (1.66-4.98)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	0/0	6247305	19	>100:1	Target = 2.54		4710.00	4972.85		
377 > 85	45	2.836	2.844		2467446	17	>100:1	2.53 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	0/0	1042239	22	>100:1	Target = 3.57		4760.00	4474.00		
449 > 99	45	3.183	3.183		307071	22	>100:1	3.39 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	177171	27	>100:1			5000.00	4777.54	99	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	0/-1	298079	21	>100:1	Target = 1.48		4740.00	4422.45		
427 > 81	64	3.151	3.152		204531	21	>100:1	1.45 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	0	822974	22	>100:1			1000.00	963.57	83	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.177	3.177	0/0	3901197	22	>100:1	Target = 2.75		5000.00	4862.72		
413 > 169	53	3.177	3.177		1356320	22	>100:1	2.87 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	198362	19	>100:1			1000.00	929.43	87.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.543	3.537	1/0	1055758	39	>100:1	Target = 3.90	0.26	4640.00	4970.69		
499 > 99	54	3.543	3.537		275070	41	>100:1	3.83 (1.95-5.85)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.741	3.742	0/-1	2559048	20	>100:1			4660.00	4652.53		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.870	3.871	0/-1	998929	18	>100:1	Target = 3.46		4800.00	5783.89		
549 > 99	54	3.878	3.871		235365	17	>100:1	4.24 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.167	4.159	1/0	890007	17	>100:1	Target = 3.36		4820.00	4837.05		
599 > 99	54	4.167	4.159		281335	17	>100:1	3.16 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.319	4.320	0/-1	2410101	15	>100:1			4710.00	4895.15		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.654	4.646	1/0	858823	17	>100:1	Target = 3.51		4840.00	5023.82		
699 > 99	54	4.647	4.646		249383	17	>100:1	3.44 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	0	855062	21	>100:1			1000.00	966.08	89.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.543	3.544	0/0	3767303	18	>100:1	Target = 4.84		5000.00	5192.47		
463 > 169	56	3.543	3.544		777766	19	>100:1	4.84 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	400396	19	>100:1			1000.00	998.67	102.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/-1	1974159	18	>100:1	Target = 42.34		5000.00	4988.50		
498>478	55	3.855	3.856		50422	17	>100:1	39.15 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.870	3.871	0	142925	17	>100:1			5000.00	5005.10	108.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.878	3.871	1/1	218317	17	>100:1	Target = 1.37		4790.00	4931.17		
527 > 81	65	3.870	3.871		138008	18		1.58 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.450	4.449	1/1	295407	17	>100:1	Target = 2.23		4820.00	4821.68		
627 > 80	65	4.457	4.449		124921	19	>100:1	2.36 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.878	3.878	0	691532	18	>100:1			1000.00	962.09	83.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.878	3.878	0/0	3161521	18	>100:1	Target = 11.16		5000.00	5036.84		
513 > 169	51	3.878	3.878		306138	17	>100:1	10.32 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	0	881876	16	>100:1			5000.00	4925.67	102.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.039	4.030	1/1	665706	36	>100:1	Target = 1.39	0.09	5000.00	5123.06		M
570 > 483	58	4.039	4.030		442597	34	>100:1	1.50 (0.69-2.09)	0.11				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.183	4.176	1	644207	18	>100:1			1000.00	957.91	86.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.183	4.184	0/-1	2881244	17	>100:1	Target = 10.79		5000.00	4978.62		
563 > 169	52	4.183	4.184		285607	16	>100:1	10.08 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.183	4.184	0	755094	17	>100:1			5000.00	4662.71	91	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.192	4.184	1/1	777981	32	>100:1	Target = 1.79		5000.00	5371.54		M
584 > 526	60	4.183	4.184		430020	33	>100:1	1.80 (0.89-2.69)	0.18				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	0	152142	15	>100:1			1000.00	1013.82	104.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.292	0/0	735620	15	>100:1			5000.00	5090.17		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	59517	14	>100:1			1000.00	1000.65	98	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/0	318306	14	>100:1	Target = 1.04		5000.00	5273.86		
512 > 219	57	4.301	4.301		280020	15	>100:1	1.13 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	723636	18	>100:1			1000.00	997.98	90.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	3315371	18	>100:1	Target = 7.82		5000.00	4799.67		
613 > 169	38	4.443	4.443		435245	18	>100:1	7.61 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.677	4.677	1/0	1421192	17	>100:1	Target = 3.35		5000.00	4931.21		
663 > 169	38	4.677	4.677		434415	16	>100:1	3.27 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	140112	17	>100:1			1000.00	977.34	103.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	563246	17	>100:1			5000.00	4935.69		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	65234	20	>100:1			1000.00	1135.62	127.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	282520	16	>100:1	Target = 1.06		5000.00	4124.83		
526 > 219	59	4.473	4.473		256606	15	>100:1	1.10 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	756525	18	>100:1			1000.00	956.64	87.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	3039266	18	>100:1	Target = 9.29		5000.00	4940.90		
713 > 169	42	4.889	4.889		341460	18	>100:1	8.90 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.253	5.253	1	382712	17	>100:1			1000.00	939.74	99.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.253	5.253	1/0	3047641	18	>100:1	Target = 13.38		5000.00	4952.90		
813 > 269	40	5.253	5.253		225642	16	>100:1	13.50 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.584	5.584	1/0	2299161	21	>100:1	Target = 106.35		5000.00	5057.93		
913 > 319	40	5.584	5.584		22943	19	>100:1	100.21 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.885	3.878	1	682214	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	774741	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	819629	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	844857	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.536	3.537	0	211005	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221023.d
Injection Date: 22-Jul-2021 17:42:28 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 8 Auto Sampler: 8
Sample Info: ICAL 10000_SVLC-1552 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.705	0	986222	19	>100:1			1000.00	1062.93	98.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/1	9725960	19	>100:1			10000	9658.30		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	998859	16	>100:1			1000.00	1034.89	94.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	9654204	15	>100:1			10000	9693.26		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	305059	15	>100:1			1000.00	1072.55	102.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	3432613	14	>100:1	Target = 3.65		8840.00	8172.02		
298.9 > 99	44	2.108	2.118		986212	15	>100:1	3.48 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/0	2866618	18	>100:1	Target = 3.30		9380.00	9201.23		
349 > 99	44	2.458	2.457		862905	17	>100:1	3.32 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	246085	17	>100:1			5000.00	5360.08	116.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.380	2.379	1/1	747459	17	>100:1	Target = 1.50		9340.00	8613.45		
327 > 81	63	2.388	2.379		498892	18	>100:1	1.49 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	865011	16	>100:1			1000.00	1021.96	100.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	8525978	18	>100:1	Target = 16.42		10000	10294		
313 > 119	49	2.423	2.422		494307	19	>100:1	17.24 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.545	2.544	1	772914	17	>100:1			5000.00	5441.59	119.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.545	2.544	1/0	2392542	18	>100:1	Target = 0.77		20000	19336		
285 > 185	66	2.536	2.544		2965195	17	>100:1	0.80 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	902828	18	>100:1			1000.00	1016.91	87	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/0	7952483	17	>100:1	Target = 3.14		10000	9933.55		
363 > 169	47	2.801	2.800		2685223	17	>100:1	2.96 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	271798	17	>100:1			1000.00	1081.87	103.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	1/0	2653504	26	>100:1	Target = 3.31	0.19	9100.00	8714.34		
399 > 99	45	2.818	2.818		791406	25	>100:1	3.35 (1.66-4.98)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	0/-1	12750418	18	>100:1	Target = 2.54		9420.00	8994.28		
377 > 85	45	2.836	2.844		5254040	18	>100:1	2.42 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.185	3.183	1/0	2282303	20	>100:1	Target = 3.57		9520.00	8682.23		
449 > 99	45	3.185	3.183		678055	21	>100:1	3.36 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.147	3.145	1	193621	21	>100:1			5000.00	5221.13	108.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.153	3.152	1/0	648315	21	>100:1	Target = 1.48		9480.00	8857.05		
427 > 81	64	3.153	3.152		417967	21	>100:1	1.55 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.172	3.177	0	900970	22	>100:1			1000.00	1054.89	90.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.178	3.177	1/1	8509896	22	>100:1	Target = 2.75		10000	9689.05		
413 > 169	53	3.172	3.177		2986594	21	>100:1	2.84 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.545	3.537	1	231281	21	>100:1			1000.00	1083.67	101.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.545	3.537	1/0	2275179	40	>100:1	Target = 3.90	0.27	9280.00	9205.53		
499 > 99	54	3.545	3.537		557303	42	>100:1	4.08 (1.95-5.85)	0.11				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.744	3.742	1/0	5971931	19	>100:1			9320.00	9312.03		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.873	3.871	1/0	1750676	18	>100:1	Target = 3.46		9600.00	8693.81		
549 > 99	54	3.873	3.871		539416	19	>100:1	3.24 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.168	4.159	1/0	2081221	17	>100:1	Target = 3.36		9640.00	9701.16		
599 > 99	54	4.160	4.159		621400	16	>100:1	3.34 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.321	4.320	1/0	5275723	15	>100:1			9420.00	9190.33		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.655	4.646	1/0	1962861	16	>100:1	Target = 3.51		9680.00	9847.79		
699 > 99	54	4.655	4.646		579811	16	>100:1	3.38 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.545	3.544	1	888521	20	>100:1			1000.00	1003.89	93.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.552	3.544	1/0	7402131	20	>100:1	Target = 4.84		10000	9818.16		
463 > 169	56	3.545	3.544		1565286	19	>100:1	4.72 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.850	3.848	1	419164	18	>100:1			1000.00	1045.48	107	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.850	3.856	0/-1	3804017	17	>100:1	Target = 42.34		10000	9181.97		
498>478	55	3.858	3.856		101366	18	>100:1	37.52 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.873	3.871	1	152175	19	>100:1			5000.00	5329.03	115.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.873	3.871	1/0	431373	18	>100:1	Target = 1.37		9580.00	9151.24		
527 > 81	65	3.880	3.871		298544	19	>100:1	1.44 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.457	4.449	1/0	623269	18	>100:1	Target = 2.23		9640.00	9554.72		
627 > 80	65	4.457	4.449		267643	18	>100:1	2.32 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.880	3.878	1	701602	18	>100:1			1000.00	976.10	85.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.880	3.878	1/0	6631896	18	>100:1	Target = 11.16		10000	10414		
513 > 169	51	3.880	3.878		614054	17	>100:1	10.80 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.032	4.030	1	1005789	15	>100:1			5000.00	5617.78	116.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.032	4.030	1/0	1468554	32	>100:1	Target = 1.39	0.08	10000	9909.17		M
570 > 483	58	4.032	4.030		1002352	32	>100:1	1.46 (0.69-2.09)	0.17				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.185	4.176	1	674178	17	>100:1			1000.00	1002.48	90.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.185	4.184	1/0	5658194	17	>100:1	Target = 10.79		10000	9342.39		
563 > 169	52	4.185	4.184		577180	16	>100:1	9.80 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.185	4.184	1	799413	17	>100:1			5000.00	4936.38	96.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.193	4.184	1/0	1565364	33	>100:1	Target = 1.79		10000	10209		M
584 > 526	60	4.193	4.184		896352	32	>100:1	1.74 (0.89-2.69)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.283	4.283	1	153861	15	>100:1			1000.00	1025.27	105.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.293	4.292	1/0	1516844	14	>100:1			10000	10379		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.302	4.301	1	60790	14	>100:1			1000.00	1022.06	100.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.301	1/0	640711	13	69:1	Target = 1.04		10000	10393		M
512 > 219	57	4.302	4.301		588703	14	>100:1	1.08 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	757890	18	>100:1			1000.00	1045.23	95	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	6912677	18	>100:1	Target = 7.82		10000	9555.20		
613 > 169	38	4.443	4.443		952698	17	>100:1	7.25 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.678	4.677	1/0	3094443	17	>100:1	Target = 3.35		10000	10252		
663 > 169	38	4.678	4.677		918355	17	>100:1	3.36 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	161978	17	>100:1			1000.00	1129.86	119.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	1227780	17	>100:1			10000	9306.56		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	59020	17	>100:1			1000.00	1027.45	115.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	623934	16	>100:1	Target = 1.06		10000	10069		
526 > 219	59	4.473	4.473		600553	15	>100:1	1.03 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.890	4.889	1	793769	18	>100:1			1000.00	1003.73	91.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.890	4.889	1/0	6276856	19	>100:1	Target = 9.29		10000	9725.42		
713 > 169	42	4.890	4.889		720124	17	>100:1	8.71 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.256	5.253	1	448927	16	>100:1			1000.00	1102.33	117.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.256	5.253	1/0	6701987	17	>100:1	Target = 13.38		10000	9285.30		
813 > 269	40	5.256	5.253		481254	18	>100:1	13.92 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.587	5.584	1/0	5195213	21	>100:1	Target = 106.35		10000	9743.24		
913 > 319	40	5.587	5.584		45807	21	>100:1	113.41 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.880	3.878	1	670924	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	866085	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.178	3.171	1	876260	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	915770	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.545	3.537	1	218690	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221024.d
Injection Date: 22-Jul-2021 17:53:04 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 9 Auto Sampler: 9
Sample Info: ICAL 15000_SVLC-1553 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	803630	20	>100:1			1000.00	866.14	80.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/0	11941390	19	>100:1			15000	14553		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	844615	16	>100:1			1000.00	875.08	79.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	11828789	15	>100:1			15000	14046		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	254183	15	>100:1			1000.00	893.68	85.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	4654585	15	>100:1	Target = 3.65		13260	13299		
298.9 > 99	44	2.108	2.118		1261118	15	>100:1	3.69 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.449	2.457	0/-1	3614434	19	>100:1	Target = 3.30		14070	13924		
349 > 99	44	2.458	2.457		1031350	17	>100:1	3.50 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	196732	19	>100:1			5000.00	4285.11	93.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.380	2.379	1/1	901427	18	>100:1	Target = 1.50		14010	12994		
327 > 81	63	2.388	2.379		596572	19	>100:1	1.51 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	728114	18	>100:1			1000.00	860.22	84.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	10345236	18	>100:1	Target = 16.42		15000	14839		
313 > 119	49	2.423	2.422		609061	19	>100:1	16.98 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	0	618211	17	>100:1			5000.00	4352.43	95.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.536	2.544	0/0	2790466	19	>100:1	Target = 0.77		30000	28196		
285 > 185	66	2.536	2.544		3779386	18	>100:1	0.73 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	769716	18	>100:1			1000.00	866.98	74.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.801	2.800	1/0	9861805	18	>100:1	Target = 3.14		15000	14449		
363 > 169	47	2.801	2.800		2921469	18	>100:1	3.37 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	219474	20	>100:1			1000.00	873.60	83.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.810	2.818	0/-1	3206971	27	>100:1	Target = 3.31	0.19	13650	13043		
399 > 99	45	2.810	2.818		978650	23	>100:1	3.27 (1.66-4.98)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.844	0/-1	15206440	18	>100:1	Target = 2.54		14130	13284		
377 > 85	45	2.836	2.844		6400115	18	>100:1	2.37 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.183	3.183	0/-1	2892307	21	>100:1	Target = 3.57		14280	13626		
449 > 99	45	3.183	3.183		788280	22	>100:1	3.66 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	151905	21	>100:1			5000.00	4096.23	84.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	0/-1	873787	21	>100:1	Target = 1.48		14220	15256		
427 > 81	64	3.151	3.152		516435	21	>100:1	1.69 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	0	696627	21	>100:1			1000.00	815.63	70.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.183	3.177	1/1	10439518	23	>100:1	Target = 2.75		15000	15373		
413 > 169	53	3.177	3.177		3807115	21	>100:1	2.74 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	182378	19	>100:1			1000.00	854.54	80.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.543	3.537	1/0	2824511	40	>100:1	Target = 3.90	0.08	13920	14505		M
499 > 99	54	3.543	3.537		653398	38	>100:1	4.32 (1.95-5.85)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.748	3.742	1/0	7585684	21	>100:1			13980	15000		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.878	3.871	1/0	2217287	18	>100:1	Target = 3.46		14400	13963		
549 > 99	54	3.871	3.871		661600	18	>100:1	3.35 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.167	4.159	1/0	2337455	16	>100:1	Target = 3.36		14460	13817		
599 > 99	54	4.167	4.159		745290	17	>100:1	3.13 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.320	4.320	0/-1	6637468	15	>100:1			14130	14663		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.655	4.646	1/0	2368181	17	>100:1	Target = 3.51		14520	15067		
699 > 99	54	4.655	4.646		689079	17	>100:1	3.43 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.543	3.544	0	696083	20	>100:1			1000.00	786.46	72.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.550	3.544	1/1	9066152	19	>100:1	Target = 4.84		15000	15350		
463 > 169	56	3.550	3.544		2018368	19	>100:1	4.49 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.856	3.848	1	341573	18	>100:1			1000.00	851.95	87.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.856	0/-1	4887849	18	>100:1	Target = 42.34		15000	14478		
498>478	55	3.856	3.856		122324	19	>100:1	39.95 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.878	3.871	1	111540	26	>100:1			5000.00	3906.03	84.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.878	3.871	1/0	545063	18	>100:1	Target = 1.37		14370	15776		
527 > 81	65	3.878	3.871		360661	19	>100:1	1.51 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.457	4.449	1/0	757812	18		Target = 2.23		14460	15850		
627 > 80	65	4.450	4.449		313863	18	>100:1	2.41 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.886	3.878	1	558988	19	>100:1			1000.00	777.69	67.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.886	3.878	1/0	7858528	18	>100:1	Target = 11.16		15000	15489		
513 > 169	51	3.886	3.878		751393	17	>100:1	10.45 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	0	824966	16	>100:1			5000.00	4607.80	95.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.040	4.030	1/1	1779252	33	>100:1	Target = 1.39	0.09	15000	14637		M
570 > 483	58	4.040	4.030		1246347	32	>100:1	1.42 (0.69-2.09)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.184	4.176	1	556901	16	>100:1			1000.00	828.09	75.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.184	4.184	0/-1	7389633	16	>100:1	Target = 10.79		15000	14771		
563 > 169	52	4.184	4.184		694600	16	>100:1	10.63 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.184	4.184	0	667341	17	>100:1			5000.00	4120.83	80.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.192	4.184	1/1	1907754	35	>100:1	Target = 1.79		15000	14904		M
584 > 526	60	4.192	4.184		1072850	32	>100:1	1.77 (0.89-2.69)	0.23				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	0	138826	15	>100:1			1000.00	925.08	95.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.292	0/0	1920503	14	>100:1			15000	14564		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	48965	15	>100:1			1000.00	823.24	80.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/0	816492	14	89:1	Target = 1.04		15000	16443		
512 > 219	57	4.301	4.301		740112	14	99:1	1.10 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	623624	18				1000.00	860.06	78.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.443	4.443	1/0	8328230	17	>100:1	Target = 7.82		15000	13990		
613 > 169	38	4.443	4.443		1132885	18	>100:1	7.35 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.677	4.677	1/0	3656987	18	>100:1	Target = 3.35		15000	14724		
663 > 169	38	4.677	4.677		1083408	17	>100:1	3.37 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	133831	15	>100:1			1000.00	933.52	98.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.457	4.456	1/0	1543972	17	>100:1			15000	14165		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	50322	17	>100:1			1000.00	876.03	98.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	790697	15	>100:1	Target = 1.06		15000	14965		
526 > 219	59	4.473	4.473		713955	15	>100:1	1.10 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	657461	19	>100:1			1000.00	831.37	76.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	7652488	19	>100:1	Target = 9.29		15000	14315		
713 > 169	42	4.889	4.889		845104	17	>100:1	9.05 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.254	5.253	1	352028	16	>100:1			1000.00	864.40	91.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.262	5.253	1/0	7943950	17	>100:1	Target = 13.38		15000	14035		
813 > 269	40	5.254	5.253		599915	18	>100:1	13.24 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.592	5.584	1/0	6480679	21	>100:1	Target = 106.35		15000	15500		
913 > 319	40	5.585	5.584		57473	20	>100:1	112.76 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.886	3.878	1	549041	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	681533	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	719647	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	769676	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	179156	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221025.d
Injection Date: 22-Jul-2021 18:03:42 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 10 Auto Sampler: 10
Sample Info: ICAL 20000_SVLC-1554 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	810258	19	>100:1			1000.00	873.28	81.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/0	16016213	20	>100:1			20000	19359		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	813509	16	>100:1			1000.00	842.86	76.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.055	1/0	16123551	15	>100:1			20000	19877		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	250392	15	>100:1			1000.00	880.35	84.3	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	6182232	16	>100:1	Target = 3.65		17680	17931		
298.9 > 99	44	2.108	2.118		1622554	15	>100:1	3.81 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.457	2.457	1/0	4753712	18	>100:1	Target = 3.30		18760	18590		
349 > 99	44	2.457	2.457		1431520	17	>100:1	3.32 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.379	2.388	0	203589	24	>100:1			5000.00	4434.46	96.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.379	1/1	1331305	17	>100:1	Target = 1.50		18680	18544		
327 > 81	63	2.388	2.379		758161	17	>100:1	1.75 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	718849	18	>100:1			1000.00	849.28	83.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.422	1/0	13460105	17	>100:1	Target = 16.42		20000	19555		
313 > 119	49	2.423	2.422		862340	18	>100:1	15.60 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.544	2.544	1	625061	18	>100:1			5000.00	4400.66	96.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.544	2.544	1/0	3810893	18	>100:1	Target = 0.77		40000	38084		
285 > 185	66	2.544	2.544		5248810	18	>100:1	0.72 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.800	2.800	1	748313	17	>100:1			1000.00	842.87	72.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.800	2.800	1/0	13044212	17	>100:1	Target = 3.14		20000	19658		
363 > 169	47	2.800	2.800		4171507	17	>100:1	3.12 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	208898	18	>100:1			1000.00	831.50	79.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	1/0	4109022	27	>100:1	Target = 3.31	0.20	18200	17558		
399 > 99	45	2.818	2.818		1259694	23	>100:1	3.26 (1.66-4.98)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.844	2.844	1/0	20445575	18	>100:1	Target = 2.54		18840	18765		
377 > 85	45	2.844	2.844		8406538	18	>100:1	2.43 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.189	3.183	1/0	3897064	22	>100:1	Target = 3.57		19040	19289		
449 > 99	45	3.183	3.183		1112797	22	>100:1	3.50 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	160346	21	>100:1			5000.00	4323.85	89.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.151	3.152	0/-1	1097727	22	>100:1	Target = 1.48		18960	18167		
427 > 81	64	3.151	3.152		712271	21	>100:1	1.54 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.183	3.177	1	673180	21	>100:1			1000.00	788.18	67.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.183	3.177	1/0	13682377	22	>100:1	Target = 2.75		20000	20850		
413 > 169	53	3.176	3.177		5133029	22	>100:1	2.66 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	186054	20	>100:1			1000.00	871.76	81.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.550	3.537	1/0	3887077	38	>100:1	Target = 3.90	0.27	18560	19575		
499 > 99	54	3.543	3.537		990835	39	>100:1	3.92 (1.95-5.85)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.748	3.742	1/0	10007484	20	>100:1			18640	19398		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.878	3.871	1/0	2866368	19	>100:1	Target = 3.46		19200	17694		
549 > 99	54	3.878	3.871		872999	17	>100:1	3.28 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.167	4.159	1/0	3185276	17	>100:1	Target = 3.36		19280	18457		
599 > 99	54	4.167	4.159		990718	16	>100:1	3.21 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.319	4.320	0/-1	8990127	15	>100:1			18840	19468		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.654	4.646	1/0	3080009	16	>100:1	Target = 3.51		19360	19209		
699 > 99	54	4.654	4.646		923524	16	>100:1	3.33 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.550	3.544	1	759834	19	>100:1			1000.00	858.49	79.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.550	3.544	1/0	12553626	19	>100:1	Target = 4.84		20000	19471		
463 > 169	56	3.550	3.544		2672590	20	>100:1	4.69 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	335466	18	>100:1			1000.00	836.72	85.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/-1	6970346	18	>100:1	Target = 42.34		20000	21022		
498>478	55	3.855	3.856		169348	17	>100:1	41.15 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.878	3.871	1	119826	26	>100:1			5000.00	4196.19	90.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.878	3.871	1/0	746356	20	>100:1	Target = 1.37		19160	20108		
527 > 81	65	3.878	3.871		483730	18	>100:1	1.54 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.456	4.449	1/0	1058795	17	>100:1	Target = 2.23		19280	20613		
627 > 80	65	4.456	4.449		445015	18	>100:1	2.37 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.885	3.878	1	603997	18	>100:1			1000.00	840.31	73.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.885	3.878	1/0	10392733	18	>100:1	Target = 11.16		20000	18957		
513 > 169	51	3.885	3.878		1030857	18	>100:1	10.08 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.039	4.030	1	840979	17	>100:1			5000.00	4697.24	97.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.039	4.030	1/0	2438414	33	>100:1	Target = 1.39	0.09	20000	19678		M
570 > 483	58	4.039	4.030		1685479	32	>100:1	1.44 (0.69-2.09)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.183	4.176	1	543337	16	>100:1			1000.00	807.92	73.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.183	4.184	0/-1	9765698	17	>100:1	Target = 10.79		20000	20007		
563 > 169	52	4.183	4.184		941733	16	>100:1	10.36 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.191	4.184	1	683075	18	>100:1			5000.00	4217.99	82.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.191	4.184	1/0	2564622	34	>100:1	Target = 1.79	0.07	20000	19574		M
584 > 526	60	4.191	4.184		1404675	31	>100:1	1.82 (0.89-2.69)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	0	140708	15	>100:1			1000.00	937.62	96.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.291	4.292	0/0	2593223	15	>100:1			20000	19402		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	57338	15	>100:1			1000.00	964.02	94.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.301	4.301	0/0	1107415	14	86:1	Target = 1.04		20000	19046		
512 > 219	57	4.310	4.301		972096	14	>100:1	1.13 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	618693	17	>100:1			1000.00	853.26	77.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.449	4.443	1/0	11032454	17	>100:1	Target = 7.82		20000	18681		
613 > 169	38	4.443	4.443		1483788	17	>100:1	7.43 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.677	4.677	1/0	5129262	17	>100:1	Target = 3.35		20000	20816		
663 > 169	38	4.677	4.677		1447920	17	>100:1	3.54 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	132021	16	>100:1			1000.00	920.90	97.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.456	4.456	1/0	2144442	17	>100:1			20000	19943		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.464	4.464	1	54500	16	>100:1			1000.00	948.76	106.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.473	4.473	1/0	1116884	16	>100:1	Target = 1.06		20000	19518		
526 > 219	59	4.473	4.473		986356	16	>100:1	1.13 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	673974	17	>100:1			1000.00	852.25	78	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	10184487	18	>100:1	Target = 9.29		20000	18585		
713 > 169	42	4.889	4.889		1136360	17	>100:1	8.96 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.253	5.253	1	333663	16	>100:1			1000.00	819.30	87	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.262	5.253	1/0	10389813	18	>100:1	Target = 13.38		20000	19367		
813 > 269	40	5.262	5.253		800180	17	>100:1	12.98 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.591	5.584	1/0	8791541	21	>100:1	Target = 106.35		20000	22184		
913 > 319	40	5.591	5.584		74809	21	>100:1	117.51 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.885	3.878	1	567636	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	696333	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.183	3.171	1	730605	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	784926	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.550	3.537	1	191479	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221026.d		
Injection Date:	22-Jul-2021 18:14:21	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	100
Lab Sample ID:	ID BLK C1	Lab Prep. Batch:	
Sample Info:	ID BLK C1	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	971179	20	>100:1			1001.00	1046.72	97.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.705		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	971278	15	>100:1			1001.00	1006.32	91.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.055		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	285670	15	>100:1			1001.00	1004.38	96.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.118		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.458	2.457	1/0	1290	21	8.2:1	Target = 3.07		4.4261	4.4261		
349 > 99	44	2.458	2.457		429	11	5.9:1	3.00 (1.53-4.61)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	1	238098	19	>100:1			5005.00	5186.12	113	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.379		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	891400	17	>100:1			1001.00	1053.14	103.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.422		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.536	2.544	0	760882	17	>100:1			5005.00	5356.89	117.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.544		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	878747	18	>100:1			1001.00	989.78	84.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.800		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	261478	19	>100:1			1001.00	1040.79	99.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	1/0	2224	27	11:1	Target = 3.46	0.17	7.5997	7.5997		
399 > 99	45	2.827	2.818		1069	38	3.7:1	2.08 (1.73-5.19)	0.85				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.844		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.183		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.151	3.145	1	196246	21	>100:1			5005.00	5291.91	109.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.152		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	0	890840	22	>100:1			1001.00	1043.03	89.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.177		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	194853	19	>100:1			1001.00	912.99	85.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.537		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.748	3.742	1/0	2899	21	17:1			5.3709	5.3709		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.871		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.159		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.329	4.320	1/0	2099	15	17:1			4.3444	4.3444		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.647	4.646	1/0	791	12	8.4:1	Target = 3.46		4.7151	4.7151		
699 > 99	54	4.662	4.646		191	16		4.14 (1.73-5.20)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.550	3.544	1	872484	19	>100:1			1001.00	985.77	91.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.544		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	441424	18	>100:1			1001.00	1101.00	112.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.856		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.878	3.871	1	153533	18	>100:1			5005.00	5376.58	116.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.871		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.449		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.885	3.878	1	763351	19	>100:1			1001.00	1062.01	92.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.885	3.878	1/0	4816	17	9.2:1	Target = 9.46		6.9578	6.9578		
513 > 169	51	3.885	3.878		877	12	5.8:1	5.49 (4.73-14.20)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.030	4.030	0	994636	15	>100:1			5005.00	5555.49	115.3	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.030		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.183	4.176	1	729280	16	>100:1			1001.00	1084.41	98.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.184		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.183	4.184	0	883776	16	>100:1			5005.00	5457.32	106.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.200	4.184	1/1	1849	39	8.7:1	Target = 2.06	0.22	10.918	10.918		
584 > 526	60	4.208	4.184		956	51	4.5:1	1.93 (1.03-3.09)	0.46				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.283	0	161025	15	>100:1			1001.00	1073.01	110.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.292		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	61068	15	>100:1			1001.00	1026.73	100.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.301		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.443	4.443	1	797646	17	>100:1			1001.00	1100.05	99.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.443		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.677		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	151038	16	>100:1			1001.00	1053.55	111.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.456		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	61947	16	>100:1			1001.00	1078.40	121.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.473		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	769023	18	>100:1			1001.00	972.44	89	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.889	4.889	1/0	3377	13	8.5:1	Target = 9.19		5.4061	5.4061		
713 > 169	42	4.889	4.889		489	17	4.5:1	6.90 (4.59-13.79)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.262	5.253	1	425362	16	>100:1			1001.00	1044.47	111	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.262	5.253	1/0	11675	15	15:1	Target = 13.88		17.088	17.088		
813 > 269	40	5.270	5.253		1019	21	10:1	11.45 (6.94-20.83)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.599	5.584	1/0	7331	17	6.7:1	Target = 106.53		14.525	14.525		
913 > 319	40	5.606	5.584		92	22	6.1:1	79.68 (53.26-159.80)					
*** 37 13C2_PFDA**													
515 > 470		3.885	3.878	1	800450	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	832373	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.183	3.171	1	1005472	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	1004313	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.550	3.537	1	272655	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221027.d
Injection Date: 22-Jul-2021 18:25:03 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1577 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	434.90	87	70 - 130
D 46 13C4_PFBA	997866	1043858			104.6	50 - 150
D 50 13C5_PFPeA	1059542	1138873			107.5	50 - 150
21 PFPeA			500.00	417.42	83.5	70 - 130
D 44 13C3_PFBS	297147	333161			112.1	50 - 150
7 PFBS			442.50	347.02	78.4	70 - 130
1 4:2 FTS			467.50	436.57	93.4	70 - 130
D 63 13C2_4:2 FTS_2	210753	235252			111.6	50 - 150
D 49 13C5_PFHxA	864384	977773			113.1	50 - 150
15 PFHxA			500.00	397.81	79.6	70 - 130
22 PFPeS			470.00	391.57	83.3	70 - 130
28 GenX			2500.00	2236.47	89.5	70 - 130
D 66 13C3_GenX	649017	753194			116.1	50 - 150
D 47 13C4_PFHpA	1037869	1016453			97.9	50 - 150
13 PFHpA			500.00	419.55	83.9	70 - 130
D 45 13C3_PFHxS	261903	274511			104.8	50 - 150
14 PFHxS			456.00	386.30	84.7	70 - 130
29 ADONA			2355.00	2486.63	105.6	70 - 130
D 64 13C2_6:2 FTS_2	179008	198935			111.1	50 - 150
2 6:2 FTS			475.00	391.15	82.3	70 - 130
20 PFOA			500.00	444.49	88.9	70 - 130
D 53 13C8_PFOA	991369	1004348			101.3	50 - 150
12 PFHpS			475.00	411.84	86.7	70 - 130
18 PFOS			462.75	377.80	81.6	70 - 130
D 54 13C8_PFOS	227393	251056			110.4	50 - 150
17 PFNA			500.00	428.11	85.6	70 - 130
D 56 13C9_PFNA	954829	983209			103	50 - 150
30 9Cl-PF3ONS			2330.00	1867.02	80.1	70 - 130
D 55 13C8_PFOSA	391661	421050			107.5	50 - 150
19 PFOSA			500.00	457.72	91.5	70 - 130
16 PFNS			480.00	381.25	79.4	70 - 130
D 65 13C2_8:2 FTS_2	132148	130382			98.7	50 - 150
3 8:2 FTS			480.00	573.22	119.4	70 - 130
10 PFDA			500.00	369.04	73.8	70 - 130
D 51 13C6_PFDA	824029	880227			106.8	50 - 150
6 N-MeFOSAA			500.00	521.15	104.2	70 - 130

Report Date: 25-Jul-2021 09:47:46 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221027.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	862293	952420			110.5	50 - 150
9 PFDS			482.50	401.17	83.1	70 - 130
D 52 13C7_PFUdA	741490	718388			96.9	50 - 150
5 N-EtFOSAA			500.00	522.12	104.4	70 - 130
25 PFUdA			500.00	459.64	91.9	70 - 130
D 60 d5-EtFOSAA	830172	880794			106.1	50 - 150
D 61 d7-MeFOSE	145483	156107			107.3	50 - 150
D 57 d3-MeFOSA	60705	56017			92.3	50 - 150
31 11Cl-PF3OUDS			2355.00	1812.85	77	70 - 130
D 62 d9-EtFOSE	135458	150921			111.4	50 - 150
11 PFDoA			500.00	430.33	86.1	70 - 130
D 38 13C2_PFDoA	798101	837870			105	50 - 150
4 10:2 FTS			2410.00	3015.65	125.1	70 - 130
D 59 d5-EtFOSA	51036	64539			126.5	50 - 150
24 PFTrDA			500.00	407.06	81.4	70 - 130
23 PFTeDA			500.00	422.33	84.5	70 - 130
D 42 13C2_PFTeDA	864247	905318			104.8	50 - 150
D 40 13C2_PFHxDA	383301	446402			116.5	50 - 150

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221027.d
Injection Date: 22-Jul-2021 18:25:03 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1577 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.706	1.705	1	1043858	20	>100:1			1000.00	1125.05	104.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.706	1.705	1/0	463540	20	>100:1			500.00	434.90		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.055	1	1138873	15	>100:1			1000.00	1179.96	107.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.055	2.055	1/0	474019	15	>100:1			500.00	417.42		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	333161	15	>100:1			1000.00	1171.35	112.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.108	2.118	0/-1	159190	16	>100:1	Target = 3.65		442.50	347.02		
298.9 > 99	44	2.108	2.118		46488	17	>100:1	3.42 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.457	2.457	1/0	133229	19	>100:1	Target = 3.30		470.00	391.57		
349 > 99	44	2.457	2.457		41963	18	>100:1	3.17 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	1	235252	19	>100:1			5000.00	5124.13	111.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.379	1/0	36217	16	>100:1	Target = 1.50		467.50	436.57		
327 > 81	63	2.388	2.379		23824	12	>100:1	1.52 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.422	2.422	1	977773	18	>100:1			1000.00	1155.18	113.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.422	2.422	1/0	372444	18	>100:1	Target = 16.42		500.00	397.81		
313 > 119	49	2.422	2.422		22851	18	>100:1	16.29 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.544	2.544	1	753194	19	>100:1			5000.00	5302.76	116.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.544	2.544	1/0	269667	19	>100:1	Target = 0.77		2500.00	2236.47		
285 > 185	66	2.544	2.544		336938	17	>100:1	0.80 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.800	2.800	1	1016453	18	>100:1			1000.00	1144.89	97.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.800	2.800	1/0	378146	17	>100:1	Target = 3.14		500.00	419.55		
363 > 169	47	2.800	2.800		122378	17	>100:1	3.08 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	274511	19	>100:1			1000.00	1092.67	104.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.818	1/0	118802	26	>100:1	Target = 3.31	0.18	456.00	386.30		
399 > 99	45	2.818	2.818		31131	23	>100:1	3.81 (1.66-4.98)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.844	2.844	1/0	3560274	18	>100:1	Target = 2.54		2355.00	2486.63		
377 > 85	45	2.835	2.844		1081224	18	>100:1	3.29 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.185	3.183	1/0	109340	20	>100:1	Target = 3.57		475.00	411.84		
449 > 99	45	3.185	3.183		32832	18	>100:1	3.33 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.153	3.145	1	198935	21	>100:1			5000.00	5364.43	111.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.153	3.152	1/0	33422	29	>100:1	Target = 1.48		475.00	391.15		
427 > 81	64	3.153	3.152		22695	26	>100:1	1.47 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.179	3.177	1	1004348	21	>100:1			1000.00	1175.92	101.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.179	3.177	1/0	435190	22	>100:1	Target = 2.75		500.00	444.49		
413 > 169	53	3.179	3.177		145919	20	>100:1	2.98 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.545	3.537	1	251056	20	>100:1			1000.00	1176.33	110.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.545	3.537	1/0	106881	40	>100:1	Target = 3.90	0.23	462.75	377.80		M
499 > 99	54	3.545	3.537		27316	37	>100:1	3.91 (1.95-5.85)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.744	3.742	1/0	1299720	21	>100:1			2330.00	1867.02		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.873	3.871	1/0	83336	18	>100:1	Target = 3.46		480.00	381.25		M
549 > 99	54	3.881	3.871		27516	20	>100:1	3.02 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.169	4.159	1/0	93423	14	>100:1	Target = 3.36		482.50	401.17		
599 > 99	54	4.169	4.159		25230	15	>100:1	3.70 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.321	4.320	1/0	1129648	15	>100:1			2355.00	1812.85		
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.552	3.544	1	983209	20	>100:1			1000.00	1110.87	103	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.552	3.544	1/0	357155	19	>100:1	Target = 4.84		500.00	428.11		
463 > 169	56	3.552	3.544		74169	19	>100:1	4.81 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.858	3.848	1	421050	17	>100:1			1000.00	1050.18	107.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.858	3.856	1/0	190481	18	>100:1	Target = 42.34		500.00	457.72		
498>478	55	3.851	3.856		6115	22	39:1	31.14 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.873	3.871	1	130382	18	>100:1			5000.00	4565.85	98.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.873	3.871	1/0	23151	14	>100:1	Target = 1.37		480.00	573.22		M
527 > 81	65	3.881	3.871		16334	20	>100:1	1.41 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.458	4.449	1/0	168544	18	>100:1	Target = 2.23		2410.00	3015.65		
627 > 80	65	4.458	4.449		70363	17	>100:1	2.39 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.888	3.878	1	880227	18	>100:1			1000.00	1224.61	106.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.888	3.878	1/0	294848	17	>100:1	Target = 11.16		500.00	369.04		
513 > 169	51	3.896	3.878		28466	22	95:1	10.35 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.033	4.030	1	952420	15	>100:1			5000.00	5319.69	110.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.043	4.030	1/0	73137	17	>100:1	Target = 1.39		500.00	521.15		
570 > 483	58	4.043	4.030		49762	16	>100:1	1.46 (0.69-2.09)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.185	4.176	1	718388	16	>100:1			1000.00	1068.21	96.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.185	4.184	1/0	296638	16	>100:1	Target = 10.79		500.00	459.64		
563 > 169	52	4.185	4.184		27165	14	>100:1	10.91 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.185	4.184	1	880794	16	>100:1			5000.00	5438.90	106.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.193	4.184	1/0	88209	15	>100:1	Target = 1.79		500.00	522.12		
584 > 526	60	4.193	4.184		47259	16	>100:1	1.86 (0.89-2.69)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.284	4.283	1	156107	16	>100:1			1000.00	1040.24	107.3	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.303	4.301	1	56017	14	>100:1			1000.00	941.81	92.3	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.451	4.443	1	837870	18	>100:1			1000.00	1155.53	105	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.444	4.443	1/0	344171	17	>100:1	Target = 7.82		500.00	430.33		
613 > 169	38	4.444	4.443		52909	17	>100:1	6.50 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.678	4.677	1/0	135837	19	>100:1	Target = 3.35		500.00	407.06		
663 > 169	38	4.678	4.677		41407	15	>100:1	3.28 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.444	4.443	1	150921	22	>100:1			1000.00	1052.73	111.4	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.466	4.464	1	64539	16	>100:1			1000.00	1123.52	126.5	
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.890	4.889	1	905318	18	>100:1			1000.00	1144.79	104.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.890	4.889	1/0	310878	18	>100:1	Target = 9.29		500.00	422.33		
713 > 169	42	4.890	4.889		33571	18	>100:1	9.26 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.256	5.253	1	446402	16	>100:1			1000.00	1096.13	116.5	
*** 37 13C2_PFDA**													
515 > 470		3.888	3.878	1	673993	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.422	2.422	1	811230	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.179	3.171	1	911504	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	912690	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.545	3.537	1	247106	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221028.d
Injection Date: 22-Jul-2021 18:35:36 Injection Vol: 10.0 uL
Sample Type: CheckStd Auto Sampler: 12
Sample Info: ISOMERS_SVLC-1562 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: IsomerCheck Conc. Level: Smp Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.700	1.705	0	992143	20	>100:1			1000.00	1069.31	99.4	
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.055	1	1025325	16	>100:1			1000.00	1062.31	96.8	
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.108	2.107	1	307999	16	>100:1			1000.00	1082.89	103.7	
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.388	0	260383	18	>100:1			5000.00	5671.52	123.5	
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.422	1	960616	18	>100:1			1000.00	1134.91	111.1	
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.545	2.544	1	772114	18	>100:1			5000.00	5435.96	119	
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.801	2.800	1	907077	18	>100:1			1000.00	1021.69	87.4	
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.818	1	282629	24	>100:1			1000.00	1124.98	107.9	
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.158	3.145	1	187901	21	>100:1			5000.00	5066.89	105	
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.177	3.177	0	920016	21	>100:1			1000.00	1077.19	92.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.183	3.177	1/1	10917480	35	>100:1	Target = 2.62	0.15	10000	12173		
413 > 169	53	3.183	3.177		4216192	35	>100:1	2.58 (1.31-3.93)	0.22				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	240127	19	>100:1			1000.00	1125.12	105.6	
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.550	3.544	1	970742	19	>100:1			1000.00	1096.78	101.7	
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	432147	17	>100:1			1000.00	1077.86	110.3	
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.878	3.871	1	168716	18	>100:1			5000.00	5908.28	127.7	
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.885	3.878	1	790702	18	>100:1			1000.00	1100.06	96	
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.039	4.030	1	969177	16	>100:1			5000.00	5413.29	112.4	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.039	4.030	1/0	2097042	34	>100:1	Target = 1.42	0.09	10000	14684		M
570 > 483	58	4.039	4.030		1462840	31	>100:1	1.43 (0.71-2.13)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.183	4.176	1	759521	16	>100:1			1000.00	1129.38	102.4	
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.192	4.184	1	959731	17	>100:1			5000.00	5926.34	115.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.192	4.184	1/0	2409147	34	>100:1	Target = 2.06		10000	13087		M
584 > 526	60	4.192	4.184		1308344	32	>100:1	1.84 (1.03-3.09)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.283	1	182829	14	>100:1			1000.00	1218.30	125.7	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.301	4.301	0	63406	14	>100:1			1000.00	1066.04	104.4	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.450	4.443	1	911403	17	>100:1			1000.00	1256.94	114.2	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.443	1	149762	17	>100:1			1000.00	1044.65	110.6	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.465	4.464	1	58664	17	>100:1			1000.00	1021.25	114.9	
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.889	4.889	1	890978	18	>100:1			1000.00	1126.65	103.1	
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.262	5.253	1	474626	16	>100:1			1000.00	1165.43	123.8	
*** 37 13C2_PFDA**													
515 > 470		3.885	3.878	1	736856	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.422	1	856220	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.177	3.171	1	912580	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.706	1.705	1	964103	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	238021	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.613	3.212	3.254	3.512	3.519	3.439	3.450	3.423	3.453	3.406	3.428	3.170-3.867	0.11611	1.759
1 4:2 FTS	0.893	1.026	1.353	1.771	1.666	1.969	1.808	1.978	1.879	1.975	1.631	0.377-2.954	0.42965	0.833
15 PFHxA	14.031	13.128	25.058	19.778	19.670	18.684	18.332	17.826	18.587	16.968	18.206	10.298-29.041	3.12369	9.835
22 PFPeS	3.236	2.899	3.017	3.131	2.741	3.011	2.863	2.861	2.937	3.054	2.975	2.313-3.168	0.14244	1.370
28 GenX	0.743	0.771	0.796	0.756	0.792	0.778	0.802	0.762	0.801	0.801	0.780	0.730-0.853	0.02047	0.396
13 PFHpA	3.729	3.626	4.038	3.688	3.691	3.699	3.761	3.747	3.689	3.615	3.728	3.329-4.052	0.12053	1.845
14 PFHxS	3.013	2.850	2.943	2.837	3.053	3.270	3.250	3.163	2.987	3.051	3.041	2.597-3.508	0.15168	1.526
29 ADONA	3.008	2.930	3.121	3.020	3.078	3.024	3.133	2.998	3.054	2.887	3.025	2.823-3.332	0.08492	1.539
2 6:2 FTS	Disabled	1.603	1.602	1.986	1.824	1.966	1.821	1.888	1.888	1.794	1.819	1.414-2.233	0.13649	0.912
20 PFOA	2.682	3.014	2.640	3.017	2.883	2.685	2.898	2.853	3.040	2.880	2.859	2.421-3.344	0.15393	1.441
12 PFHpS	2.754	3.053	3.578	3.274	3.062	3.160	3.143	2.970	3.104	2.957	3.105	2.405-3.718	0.21869	1.531
18 PFOS	3.458	3.004	3.025	3.387	3.415	3.427	3.449	3.289	3.288	3.372	3.311	2.828-4.001	0.19534	1.707
17 PFNA	7.315	6.232	6.097	6.165	6.365	6.364	6.419	6.205	6.468	6.017	6.364	5.200-7.529	0.38823	3.182
19 PFOSA	69.990	52.330	34.668	27.726	28.473	32.713	32.270	32.526	30.906	30.582	37.218	-13.074-70.020	13.84911	14.236
16 PFNS	2.370	2.991	3.315	2.530	2.513	2.612	2.708	2.741	2.805	2.756	2.734	1.730-3.295	0.26096	1.256
10 PFDA	10.069	14.382	13.280	14.604	13.356	13.003	13.142	12.930	12.566	12.724	13.005	9.699-17.012	1.21871	6.678
3 8:2 FTS	1.577	1.517	1.982	1.945	1.968	2.064	1.988	1.857	1.848	2.011	1.875	1.329-2.606	0.21297	0.984
6 N-MeFOSAA	1.729	1.368	1.209	1.297	1.452	1.386	1.421	1.374	1.370	1.373	1.397	1.020-1.883	0.14393	0.726
9 PFDS	2.989	2.117	3.337	2.261	2.618	2.535	2.720	Disabled	Disabled	Disabled	2.653	1.432-3.803	0.39506	1.309
25 PFUdA	10.186	13.794	12.360	14.609	14.700	13.886	13.538	13.848	14.326	13.899	13.514	10.475-18.924	1.40814	7.350
5 N-EtFOSAA	3.441	1.648	1.914	1.385	1.447	1.704	1.510	1.704	1.566	1.711	1.803	-0.278-3.172	0.57502	0.723
26 MeFOSA	0.872	1.060	0.983	1.222	1.013	0.982	0.996	1.118	1.006	1.027	1.027	0.729-1.296	0.09451	0.506
27 EtFOSA	0.899	1.138	0.928	0.907	0.893	1.061	0.960	0.948	1.053	0.994	0.978	0.635-1.150	0.08599	0.446
11 PFDoA	17.404	11.511	9.422	10.673	10.018	10.373	10.714	10.193	10.249	10.510	11.106	3.257-16.778	2.25341	5.009
4 10:2 FTS	3.256	1.775	3.770	3.333	3.196	3.666	3.304	3.478	3.467	3.512	3.275	1.509-4.882	0.56222	1.598
34 PFDOS	3.580	2.776	3.093	2.779	3.093	3.074	2.931	3.077	3.134	3.223	3.076	2.399-3.786	0.23104	1.546
24 PFTrDA	8.158	8.335	8.011	7.623	8.030	7.860	7.857	8.081	8.143	7.615	7.971	7.303-8.756	0.24220	4.015
23 PFTeDA	11.812	12.137	10.917	11.359	11.304	11.364	11.381	11.748	11.166	10.899	11.408	10.099-12.508	0.40138	5.652
35 PFHxDA	11.601	11.103	9.130	10.834	10.453	10.404	10.497	10.396	10.280	10.369	10.506	8.526-12.379	0.64207	5.226
36 PFODA	14.446	12.290	13.663	13.457	13.351	13.158	13.254	13.055	12.911	12.657	13.224	11.594-15.107	0.58536	6.675

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	547	611	600	573	563	559	541	472	515	533	Avg:A Wt:C2	551		RSD=7.3	
	99.2	110.8	108.8	103.9	102.1	101.4	98	85.7	93.5	96.6	Org:N Dep:R				
8 PFBA	1.016419	1.005008	0.969197	0.979269	0.877172	0.939182	0.971835	0.977893	0.961911	0.944904	Avg:A Wt:C2	0.964279		RSD=4.0	
	105.4	104.2	100.5	101.6	91	97.4	100.8	101.4	99.8	98	Org:N Dep:R				
D 50 13C5_PFPeA	511	576	552	532	524	535	519	439	481	495	Avg:A Wt:C2	516		RSD=7.4	
	99	111.5	106.8	103	101.4	103.7	100.6	85	93.2	95.8	Org:N Dep:R				
21 PFPeA	1.142375	1.109055	1.059827	1.048168	0.941090	1.070071	1.082590	1.082854	1.057405	1.019366	Avg:A Wt:C2	1.061280		RSD=5.1	
	107.6	104.5	99.9	98.8	88.7	100.8	102	102	99.6	96.1	Org:N Dep:R				
D 44 13C3_PFBS	169	196	188	179	169	176	182	140	164	172	Avg:A Wt:C2	174		RSD=8.8	
	97.1	113.1	108.2	103	97.5	101.6	105.1	80.7	94.3	99.3	Org:N Dep:R				
7 PFBS	1.381732	1.255550	1.302964	1.288405	1.228942	1.263662	1.236027	1.381835	1.313330	1.276973	Avg:A Wt:C2	1.292942		RSD=4.2	
	106.9	97.1	100.8	99.6	95.1	97.7	95.6	106.9	101.6	98.8	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 63 13C2_4:2 FTS_2	20.0656	22.1628	21.5058	21.9484	18.0392	19.9862	19.3008	17.9994	18.5994	19.7510	Avg:A Wt:C2	19.9359		RSD=7.7	
	100.7	111.2	107.9	110.1	90.5	100.3	96.8	90.3	93.3	99.1	Org:N Dep:R				
1 4:2 FTS	1.969984	2.018352	1.754668	1.950750	2.148070	2.269259	2.125729	1.914512	1.994807	2.055682	Avg:A Wt:C2	2.020181		RSD=7.0	
	97.5	99.9	86.9	96.6	106.3	112.3	105.2	94.8	98.7	101.8	Org:N Dep:R				
D 49 13C5_PFHxA	606	659	647	645	600	624	619	499	541	589	Avg:A Wt:C2	603		RSD=8.3	
	100.5	109.3	107.3	107	99.5	103.5	102.6	82.8	89.7	97.7	Org:N Dep:R				
15 PFHxA	1.136456	0.970051	1.105495	1.009838	0.939058	1.016957	0.974863	1.065629	1.065952	0.937937	Avg:A Wt:C2	1.022224		RSD=6.8	
	111.2	94.9	108.1	98.8	91.9	99.5	95.4	104.2	104.3	91.8	Org:N Dep:R				
22 PFPeS	1.040990	0.872468	0.901285	0.964537	0.925005	0.938154	0.879388	0.995855	0.895449	0.933551	Avg:A Wt:C2	0.934668		RSD=5.7	
	111.4	93.3	96.4	103.2	99	100.4	94.1	106.5	95.8	99.9	Org:N Dep:R				
28 GenX	0.694514	0.706749	0.711356	0.656646	0.698709	0.700657	0.679510	0.647892	0.680289	0.709347	Avg:A Wt:C2	0.688567		RSD=3.2	
	100.9	102.6	103.3	95.4	101.5	101.8	98.7	94.1	98.8	103	Org:N Dep:R				
D 66 13C3_GenX	212	240	236	225	200	208	215	190	206	198	Avg:A Wt:C2	213		RSD=7.7	
	99.6	112.8	110.8	105.5	94	97.4	100.7	89.4	96.8	93	Org:N Dep:R				
13 PFHpA	1.286509	1.178728	1.131168	1.130533	1.008084	1.081766	1.064985	1.080324	1.138289	1.113823	Avg:A Wt:C2	1.121421		RSD=6.7	
	114.7	105.1	100.9	100.8	89.9	96.5	95	96.3	101.5	99.3	Org:N Dep:R				
D 47 13C4_PFHpA	492	543	527	513	483	474	503	425	434	456	Avg:A Wt:C2	485		RSD=8.0	
	101.4	112	108.7	105.8	99.5	97.7	103.7	87.6	89.5	94	Org:N Dep:R				
D 45 13C3_PFHxS	146	153	151	151	138	146	142	109	122	130	Avg:A Wt:C2	139		RSD=10.4	
	105.5	110.2	108.9	108.6	99.1	105.4	102.5	78.6	87.7	93.5	Org:N Dep:R				
14 PFHxS	1.121227	1.085313	1.008377	1.043022	1.013859	1.034529	1.038313	1.150037	1.122995	1.090854	Avg:A Wt:C2	1.070853		RSD=4.7	
	104.7	101.4	94.2	97.4	94.7	96.6	97	107.4	104.9	101.9	Org:N Dep:R				
29 ADONA	6.792623	6.160722	6.316662	5.993784	5.749857	5.987295	6.069684	6.511944	6.645386	6.159051	Avg:A Wt:C2	6.238701		RSD=5.2	
	108.9	98.8	101.2	96.1	92.2	96	97.3	104.4	106.5	98.7	Org:N Dep:R				
2 6:2 FTS	Disabled	3.574242	3.490726	2.866088	2.538598	2.523102	2.760954	2.660239	2.538669	2.431365	Avg:A Wt:C2	2.820442		RSD=15.1	
	Disabled	126.7	123.8	101.6	90	89.5	97.9	94.3	90	86.2	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	16.1862	17.3062	18.3352	16.0446	15.4642	17.2064	13.8766	13.1698	14.7236	14.5148	Avg:A Wt:C2	15.6828		RSD=10.5	
	103.2	110.4	116.9	102.3	98.6	109.7	88.5	84	93.9	92.6	Org:N Dep:R				
D 53 13C8_PFOA	507	557	550	516	539	488	514	399	425	452	Avg:A Wt:C2	495		RSD=10.8	
	102.6	112.6	111.2	104.2	108.9	98.6	103.9	80.6	85.8	91.5	Org:N Dep:R				
20 PFOA	1.015673	0.954395	0.968422	0.961601	0.805359	0.967654	0.914120	0.960996	1.022079	0.924109	Avg:A Wt:C2	0.949441		RSD=6.4	
	107	100.5	102	101.3	84.8	101.9	96.3	101.2	107.7	97.3	Org:N Dep:R				
12 PFHpS	1.072621	0.975748	0.993382	0.911480	0.941168	0.969310	0.970020	1.036016	0.992607	0.945489	Avg:A Wt:C2	0.980784		RSD=4.8	
	109.4	99.5	101.3	92.9	96	98.8	98.9	105.6	101.2	96.4	Org:N Dep:R				
D 54 13C8_PFOS	137	158	156	136	140	145	139	112	132	139	Avg:A Wt:C2	139		RSD=9.3	
	98.1	113.4	112	97.7	100.5	103.9	99.5	80.1	94.7	100.1	Org:N Dep:R				
18 PFOS	1.578661	1.256972	1.000883	1.166541	1.036035	1.115945	1.144211	1.206493	1.103505	1.134872	Ln:A Wt:C2	1.093775	19.2285	R^2=0.992	
	106.4	96	82	102.9	92.8	101.1	104.2	110.1	100.8	103.7	Org:N Dep:R			RSE=8.5	
D 56 13C9_PFNA	625	675	643	627	619	632	609	526	549	585	Avg:A Wt:C2	609		RSD=7.3	
	102.7	110.9	105.5	102.9	101.6	103.8	100	86.3	90.2	96.1	Org:N Dep:R				
17 PFNA	1.211027	1.087750	1.056915	1.012170	0.943876	1.098155	1.021197	1.020035	1.056310	1.027970	Avg:A Wt:C2	1.053541		RSD=6.7	
	114.9	103.2	100.3	96.1	89.6	104.2	96.9	96.8	100.3	97.6	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.688737	3.285706	3.460432	3.845645	3.154403	3.493060	3.522847	4.062284	3.824058	3.722494	Avg:A Wt:C2	3.605967		RSD=7.6	
	102.3	91.1	96	106.6	87.5	96.9	97.7	112.7	106	103.2	Org:N Dep:R				
D 55 13C8_PFOSA	275	295	290	270	250	293	260	229	250	259	Avg:A Wt:C2	267		RSD=8.1	
	103	110.6	108.5	101	93.6	109.7	97.4	85.6	93.5	97.1	Org:N Dep:R				
19 PFOSA	1.105052	1.151548	0.991587	1.047427	1.090677	0.984879	1.000929	1.088139	1.091422	1.131345	Avg:A Wt:C2	1.068300		RSD=5.5	
	103.4	107.8	92.8	98	102.1	92.2	93.7	101.9	102.2	105.9	Org:N Dep:R				
16 PFNS	0.885752	0.729123	0.814794	0.808249	0.682093	0.784107	0.795145	0.885268	0.800149	0.781390	Avg:A Wt:C2	0.796607		RSD=7.8	
	111.2	91.5	102.3	101.5	85.6	98.4	99.8	111.1	100.4	98.1	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	17.8008	19.2204	19.3660	17.3986	14.4364	17.0066	16.8702	15.2824	16.6032	15.2764	Avg:A Wt:C2	16.9261		RSD=9.6	
	105.2	113.6	114.4	102.8	85.3	100.5	99.7	90.3	98.1	90.3	Org:N Dep:R				
10 PFDA	1.121987	1.091406	1.113959	1.087910	0.978715	1.120213	1.017481	1.097764	1.007865	1.020853	Avg:A Wt:C2	1.065815		RSD=5.0	
	105.3	102.4	104.5	102.1	91.8	105.1	95.5	103	94.6	95.8	Org:N Dep:R				
D 51 13C6_PFDA	603	658	666	609	591	587	608	491	532	555	Avg:A Wt:C2	590		RSD=9.1	
	102.3	111.5	112.9	103.3	100.1	99.4	103.1	83.2	90.2	94	Org:N Dep:R				
3 8:2 FTS	2.236535	2.068088	2.664043	2.264118	2.622474	2.487061	2.318105	2.066044	2.035501	2.214282	Avg:A Wt:C2	2.297625		RSD=9.9	
	97.3	90	115.9	98.5	114.1	108.2	100.9	89.9	88.6	96.4	Org:N Dep:R				
D 58 d3-MeFOSAA	131	136	148	123	120	139	127	123	148	141	Avg:A Wt:C2	133		RSD=7.6	
	97.8	102.1	110.6	92.2	90.2	104.2	95	92	110.6	105.3	Org:N Dep:R				
6 N-MeFOSAA	0.982031	0.877342	0.661060	0.696446	0.771956	0.772451	0.801981	0.743534	0.722426	0.784505	Avg:A Wt:C2	0.781373		RSD=11.8	
	125.7	112.3	84.6	89.1	98.8	98.9	102.6	95.2	92.5	100.4	Org:N Dep:R				
9 PFDS	1.094012	0.676181	0.766211	0.756593	0.723345	0.739213	0.781721	Disabled	Disabled	Disabled	Ln:A Wt:C	0.759859	5.436781	R^2=0.997	
	129.1	81.6	97.1	98.1	94.5	96.9	102.7	Disabled	Disabled	Disabled	Org:N Dep:R			RSE=15.8	
D 52 13C7_PFUdA	705	716	747	634	708	721	634	527	562	617	Avg:A Wt:C2	657		RSD=11.3	
	107.3	108.9	113.8	96.5	107.7	109.7	96.5	80.2	85.5	93.9	Org:N Dep:R				
D 60 d5-EtFOSAA	120	132	131	120	104	123	113	93.8996	105	107	Avg:A Wt:C2	115		RSD=10.8	
	104	115	113.8	104.8	90.7	106.8	98.7	81.7	91.5	92.8	Org:N Dep:R				
25 PFUdA	0.821472	0.962352	0.858297	0.977931	0.780823	0.847434	0.879772	0.930643	0.924546	0.862079	Avg:A Wt:C2	0.884535		RSD=7.1	
	92.9	108.8	97	110.6	88.3	95.8	99.5	105.2	104.5	97.5	Org:N Dep:R				
5 N-EtFOSAA	1.198909	0.961713	0.892920	0.867371	0.965256	1.028107	1.003115	1.013985	0.973630	1.016873	Avg:A Wt:C2	0.992188		RSD=9.1	
	120.8	96.9	90	87.4	97.3	103.6	101.1	102.2	98.1	102.5	Org:N Dep:R				
D 61 d7-MeFOSE	72.5780	83.3930	78.7110	74.4230	68.2950	72.5570	78.6500	69.2240	75.2560	78.0920	Avg:A Wt:C2	75.1179		RSD=6.2	
	96.6	111	104.8	99.1	90.9	96.6	104.7	92.2	100.2	104	Org:N Dep:R				
32 MeFOSE	1.199537	1.109925	1.261958	1.027478	1.123801	1.247495	1.098197	1.108855	1.089627	1.163942	Avg:A Wt:C2	1.143082		RSD=6.5	
	104.9	97.1	110.4	89.9	98.3	109.1	96.1	97	95.3	101.8	Org:N Dep:R				
D 57 d3-MeFOSA	45.9100	50.8680	49.2480	47.4650	40.7770	50.6270	47.8650	48.3890	57.2100	53.6180	Avg:A Wt:C2	49.1977		RSD=9.0	
	93.3	103.4	100.1	96.5	82.9	102.9	97.3	98.4	116.3	109	Org:N Dep:R				
26 MeFOSA	0.715313	0.916097	1.160453	1.107427	1.070285	1.011565	1.028426	0.962248	0.886511	0.982414	Avg:A Wt:C2	0.984074		RSD=12.8	
	72.7	93.1	117.9	112.5	108.8	102.8	104.5	97.8	90.1	99.8	Org:N Dep:R				
31 11Cl-PF3OUDS	3.404397	3.058323	3.010505	3.467293	3.029313	3.086520	3.133430	3.605481	3.180048	3.207502	Avg:A Wt:C2	3.218281		RSD=6.4	
	105.8	95	93.5	107.7	94.1	95.9	97.4	112	98.8	99.7	Org:N Dep:R				
D 62 d9-EtFOSE	83.2060	83.3240	80.1150	80.0420	68.4520	79.8740	80.7840	71.5570	74.6630	80.7740	Avg:A Wt:C2	78.2791		RSD=6.4	
	106.3	106.4	102.3	102.3	87.4	102	103.2	91.4	95.4	103.2	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	1.277071	1.196774	1.459964	1.175608	1.200359	1.117648	1.066810	1.096601	1.155936	1.168089	Avg:A Wt:C2	1.191486		RSD=9.3	
	107.2	100.4	122.5	98.7	100.7	93.8	89.5	92	97	98	Org:N Dep:R				
D 59 d5-EtFOSA	36.8070	47.1340	45.7690	40.0380	38.0250	41.1440	44.9320	38.0390	38.8640	44.7100	Avg:A Wt:C2	41.5462		RSD=9.1	
	88.6	113.4	110.2	96.4	91.5	99	108.1	91.6	93.5	107.6	Org:N Dep:R				
27 EtFOSA	1.488847	1.335978	1.069938	0.935911	1.094701	1.164738	0.992433	1.043006	1.161999	1.009442	Ln:A Wt:C2	1.042367	22.4410	R^2=0.991	
	99.8	106.6	91.9	85.5	102.9	110.7	94.8	99.8	111.3	96.7	Org:N Dep:R			RSE=8.7	
D 38 13C2_PFDoA	751	764	824	766	745	775	783	624	709	683	Avg:A Wt:C2	742		RSD=7.6	
	101.1	103	111	103.2	100.4	104.4	105.4	84.1	95.5	92.1	Org:N Dep:R				
11 PFDoA	1.203071	1.047758	1.013770	1.051741	0.942380	0.997848	1.014622	0.951126	0.927553	0.979381	Avg:A Wt:C2	1.012925		RSD=7.8	
	118.8	103.4	100.1	103.8	93	98.5	100.2	93.9	91.6	96.7	Org:N Dep:R				
4 10:2 FTS	3.962711	3.502179	5.322242	4.214461	4.683226	4.379310	4.094197	3.691728	3.624328	3.941042	Avg:A Wt:C2	4.141542		RSD=13.2	
	95.7	84.6	128.5	101.8	113.1	105.7	98.9	89.1	87.5	95.2	Org:N Dep:R				
34 PFDOS	0.961646	0.688365	0.788200	0.850372	0.773104	0.799596	0.843411	0.921802	0.879031	0.871188	Avg:A Wt:C2	0.837672		RSD=9.4	
	114.8	82.2	94.1	101.5	92.3	95.5	100.7	110	104.9	104	Org:N Dep:R				
24 PFTrDA	0.865096	0.889027	0.795691	0.800220	0.751036	0.797844	0.728467	0.822240	0.790279	0.792006	Avg:A Wt:C2	0.803191		RSD=5.9	
	107.7	110.7	99.1	99.6	93.5	99.3	90.7	102.4	98.4	98.6	Org:N Dep:R				
D 42 13C2_PFTeDA	857	906	910	886	846	885	881	766	853	960	Avg:A Wt:C2	875		RSD=5.8	
	98	103.5	104	101.2	96.7	101.1	100.7	87.6	97.4	109.7	Org:N Dep:R				
23 PFTeDA	0.875457	0.856690	0.821765	0.825215	0.748464	0.812728	0.806877	0.795894	0.788051	0.724492	Avg:A Wt:C2	0.805563		RSD=5.6	
	108.7	106.3	102	102.4	92.9	100.9	100.2	98.8	97.8	89.9	Org:N Dep:R				
D 40 13C2_PFHxDA	814	874	870	879	769	848	862	733	852	871	Avg:A Wt:C2	837		RSD=5.9	
	97.2	104.4	103.9	105	91.8	101.3	102.9	87.6	101.8	104	Org:N Dep:R				
35 PFHxDA	0.733171	0.654204	0.619485	0.586008	0.582836	0.580047	0.560434	0.571437	0.543605	0.544164	Avg:A Wt:C2	0.597539		RSD=9.8	
	122.7	109.5	103.7	98.1	97.5	97.1	93.8	95.6	91	91.1	Org:N Dep:R				
36 PFODA	1.009160	0.905721	0.933082	0.896012	0.910934	0.899798	0.900502	0.921096	0.877661	0.858878	Avg:A Wt:C2	0.911284		RSD=4.4	
	110.7	99.4	102.4	98.3	100	98.7	98.8	101.1	96.3	94.2	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	664657	698745	719376	661837	592352	636307	624788	525891	605736	631298	1.28
* 39 13C2_PFHxA	625107	644196	668847	652725	582381	657478	598734	516865	562139	590710	1.41
* 41 13C2_PFOA	529331	570233	575643	538819	516348	530663	516445	442186	454391	469502	2.99
* 43 13C3_PFBA	495400	543881	539827	529552	474184	502696	494309	440120	466568	479357	0.82
* 48 13C4_PFOS	137646	151522	150490	136409	126954	145871	137216	109022	123534	136345	0.23

13C2_PFDA ((|631298 - 664657| / (631298 + 664657)) / 2) * 100 = 1.29
13C2_PFHxA ((|590710 - 625107| / (590710 + 625107)) / 2) * 100 = 1.41
13C2_PFOA ((|469502 - 529331| / (469502 + 529331)) / 2) * 100 = 2.99
13C3_PFBA ((|479357 - 495400| / (479357 + 495400)) / 2) * 100 = 0.82
13C4_PFOS ((|136345 - 137646| / (136345 + 137646)) / 2) * 100 = 0.24

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	546861	611000	599976	573156	563032	559024	540622	472283	515476	532517	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	27792	61406	116299	280637	493876	1050051	2626976	4618423	7437630	10063548	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	511058	575526	551519	531930	523546	535244	519236	438943	481475	494900	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	29191	63829	116903	278776	492704	1145498	2810598	4753112	7636713	10089689	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	168570	196377	187768	178777	169277	176333	182475	140086	163595	172404	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	10295	21796	43255	101809	183900	393955	996905	1711209	2848967	3892346	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	100328	110814	107529	109742	90196	99931	96504	89997	92997	98755	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	1846	4178	7049	19995	36192	84721	191602	321857	519802	758441	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	606218	659089	647271	645478	600114	624153	618656	499241	541057	589408	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	625107	644196	668847	652725	582381	657478	598734	516865	562139	590710	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	34447	63935	143111	325914	563542	1269473	3015523	5320058	8651109	11056552	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	8230	16071	31748	80873	146874	310342	752587	1308560	2061129	3019383	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	14733	33958	67171	147510	279651	581605	1457690	2465817	4208040	5617453	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1060670	1201204	1180333	1123208	1000599	1037606	1072603	951477	1030944	989899	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	31646	64035	119317	290119	486690	1024742	2677910	4590070	7410037	10153232	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	491967	543255	527406	513243	482787	473643	502901	424879	433987	455783	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	146484	153093	151195	150796	137682	146445	142331	109122	121799	129872	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	7473	15120	27748	71564	127027	275733	672418	1141998	1867043	2578419	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	46865	88846	179931	425708	745736	1651909	4068989	6693818	11436842	15069894	
2 6:2 FTS	Disabled	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	Disabled	5864	12135	21797	37216	82312	181602	332130	531520	669113	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	80931	86531	91676	80223	77321	86032	69383	65849	73618	72574	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	529331	570233	575643	538819	516348	530663	516445	442186	454391	469502	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	507486	557306	550354	515742	538966	487751	513973	399015	424537	452495	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	25772	53189	106595	247969	434061	943948	2349164	3834519	6508653	8363090	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	7479	14221	28597	65425	123362	270274	657184	1076256	1726431	2337970	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	136560	157938	156053	136027	139992	144663	138558	111576	131902	139484	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	137646	151522	150490	136409	126954	145871	137216	109022	123534	136345	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	10003	18423	28989	73628	134594	299625	735624	1249233	2026119	2937984	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	625469	675477	642980	626954	618881	632127	609273	525981	549315	585461	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	37873	73475	135915	317292	584147	1388347	3110938	5365192	8703707	12036723	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	23474	48365	100658	243770	411563	941910	2274633	4224322	7051525	9678417	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	274883	295385	289667	269529	250019	292812	260109	228568	249606	259213	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	15188	34015	57446	141156	272690	576769	1301753	2487137	4086381	5865187	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	5806	11055	24413	52773	91668	217788	528834	948237	1519794	2092634	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	89004	96102	96830	86993	72182	85033	84351	76412	83016	76382	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	33854	71781	148329	331458	577932	1314178	3094369	5385157	8039433	11323896	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	664657	698745	719376	661837	592352	636307	624788	525891	605736	631298	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	603465	657693	665774	609348	590501	586575	608241	490557	531780	554629	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1907	3808	9885	18869	36269	81040	187322	302480	485646	648111	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	652831	681319	738360	615697	601725	695403	633865	614018	738160	702845	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	6411	11955	19524	42880	92901	214866	508348	913087	1599797	2205543	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	Disabled	Disabled	Disabled	#54
	7201	10295	23053	49606	97617	206174	522072	Disabled	Disabled	Disabled	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	704613	715580	747498	633789	707587	720614	633568	526954	561767	616790	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	597877	660852	654230	602499	521292	613448	567342	469498	525972	533502	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	28941	68864	128315	309901	552500	1221346	2786976	4904060	7790693	10634436	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7168	12711	23367	52259	100636	252276	569109	952128	1536307	2170015	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	72578	83393	78711	74423	68295	72557	78650	69224	75256	78092	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	4353	9256	19866	38234	76750	181029	431866	767594	1230014	1817891	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	45910	50868	49248	47465	40777	50627	47865	48389	57210	53618	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	1642	4660	11430	26282	43643	102425	246128	465622	760759	1053502	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	21897	45501	88510	222145	399483	841216	2044902	3789526	5926895	8428925	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	83206	83324	80115	80042	68452	79874	80784	71557	74663	80774	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	5313	9972	23393	47049	82167	178542	430906	784695	1294585	1887024	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	36807	47134	45769	40038	38025	41144	44932	38039	38864	44710	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2740	6297	9794	18736	41626	95844	222960	396749	677399	902643	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	750529	764375	823994	766014	745164	774776	782694	624240	709060	683408	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	45147	80088	167068	402824	702228	1546218	3970694	5937306	9865365	13386339	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3400	6489	19872	35343	65175	143592	332917	543874	870137	1160751	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	6356	10524	23813	55986	104765	223941	565609	995597	1683536	2352565	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	32464	67955	131129	306490	559645	1236301	2850833	5132753	8405331	10825266	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	857358	906057	909992	885835	846373	884540	880859	766250	852681	960299	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	37529	77621	149560	365502	633480	1437780	3553725	6098540	10079344	13914583	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	813944	874055	869763	879100	768834	848036	861669	732913	851921	870576	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	29838	57181	107761	257580	448104	983802	2414543	4188135	6946632	9474720	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41070	79165	162312	393842	700357	1526123	3879673	6750830	11215472	14954365	

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.749	1.749	1.742	1.749	1.743	1.743	1.749	1.756	1.750	1.749	1.748	0.253
8 PFBA	1.749	1.756	1.749	1.756	1.749	1.749	1.756	1.756	1.756	1.756	1.753	0.191
D 50 13C5_PFPeA	2.056	2.045	2.055	2.045	2.045	2.045	2.045	2.045	2.045	2.055	2.048	0.240
21 PFPeA	2.056	2.045	2.055	2.045	2.045	2.045	2.045	2.045	2.045	2.055	2.048	0.240
D 44 13C3_PFBS	2.087	2.077	2.087	2.077	2.087	2.087	2.077	2.088	2.088	2.087	2.084	0.245
7 PFBS	2.098	2.077	2.087	2.077	2.087	2.087	2.077	2.088	2.088	2.087	2.085	0.316
D 63 13C2_4:2 FTS_2	2.317	2.300	2.316	2.300	2.308	2.308	2.291	2.308	2.308	2.317	2.307	0.363
1 4:2 FTS	2.326	2.300	2.316	2.300	2.317	2.308	2.291	2.308	2.308	2.308	2.308	0.426
D 49 13C5_PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
* 39 13C2_PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
15 PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
22 PFPeS	2.370	2.353	2.370	2.353	2.361	2.362	2.344	2.362	2.362	2.370	2.360	0.374
28 GenX	2.451	2.424	2.450	2.424	2.441	2.442	2.415	2.433	2.433	2.442	2.435	0.476
D 66 13C3_GenX	2.451	2.424	2.450	2.424	2.441	2.442	2.415	2.433	2.433	2.442	2.435	0.476
13 PFHpA	2.681	2.654	2.681	2.645	2.672	2.672	2.645	2.663	2.672	2.681	2.666	0.529
D 47 13C4_PFHpA	2.681	2.645	2.681	2.645	2.672	2.672	2.645	2.663	2.672	2.672	2.664	0.544
D 45 13C3_PFHxS	2.690	2.654	2.690	2.654	2.681	2.681	2.645	2.672	2.681	2.690	2.674	0.632
14 PFHxS	2.690	2.654	2.690	2.654	2.681	2.681	2.654	2.672	2.681	2.690	2.674	0.573
29 ADONA	2.718	2.681	2.717	2.681	2.708	2.709	2.681	2.700	2.709	2.708	2.701	0.540
2 6:2 FTS	Disabled	2.975	3.011	2.987	3.005	3.012	2.987	3.012	3.027	3.032	3.005	0.623
D 64 13C2_6:2 FTS_2	3.020	2.981	3.011	2.987	3.005	3.012	2.987	3.012	3.027	3.032	3.007	0.570
* 41 13C2_PFOA	3.041	3.006	3.038	3.012	3.025	3.039	3.012	3.034	3.047	3.052	3.030	0.533
D 53 13C8_PFOA	3.041	3.006	3.032	3.012	3.025	3.039	3.012	3.034	3.047	3.052	3.029	0.525
20 PFOA	3.047	3.012	3.038	3.012	3.025	3.039	3.012	3.041	3.047	3.052	3.032	0.529
12 PFHpS	3.047	3.006	3.038	3.018	3.032	3.039	3.012	3.041	3.054	3.059	3.034	0.586
D 54 13C8_PFOS	3.403	3.374	3.394	3.394	3.394	3.402	3.402	3.418	3.433	3.438	3.405	0.575
* 48 13C4_PFOS	3.411	3.374	3.401	3.394	3.394	3.402	3.394	3.418	3.433	3.438	3.405	0.575
18 PFOS	3.411	3.374	3.401	3.394	3.394	3.409	3.402	3.426	3.433	3.438	3.408	0.580
D 56 13C9_PFNA	3.418	3.381	3.401	3.402	3.401	3.409	3.402	3.433	3.440	3.446	3.413	0.602
17 PFNA	3.411	3.381	3.408	3.402	3.401	3.409	3.402	3.433	3.448	3.446	3.414	0.624
30 9Cl-PF3ONS	3.609	3.585	3.598	3.615	3.606	3.615	3.615	3.639	3.651	3.649	3.618	0.604
D 55 13C8_PFOSA	3.705	3.679	3.695	3.717	3.710	3.710	3.717	3.740	3.746	3.751	3.717	0.615
19 PFOSA	3.719	3.679	3.695	3.717	3.710	3.710	3.717	3.733	3.753	3.751	3.718	0.616

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.746	3.726	3.737	3.752	3.744	3.752	3.758	3.775	3.790	3.787	3.756	0.561
D 65 13C2_8:2 FTS_2	3.753	3.726	3.737	3.759	3.751	3.752	3.758	3.782	3.798	3.795	3.761	0.630
10 PFDA	3.760	3.733	3.751	3.766	3.758	3.759	3.765	3.790	3.806	3.803	3.769	0.624
* 37 13C2_PFDA	3.760	3.733	3.744	3.766	3.758	3.765	3.765	3.790	3.798	3.803	3.768	0.601
D 51 13C6_PFDA	3.753	3.733	3.744	3.766	3.758	3.759	3.765	3.782	3.798	3.803	3.766	0.595
3 8:2 FTS	3.760	3.733	3.744	3.759	3.758	3.759	3.758	3.782	3.798	3.795	3.764	0.557
D 58 d3-MeFOSAA	3.912	3.887	3.901	3.918	3.917	3.918	3.926	3.945	3.954	3.960	3.923	0.591
6 N-MeFOSAA	3.912	3.895	3.909	3.926	3.926	3.918	3.926	3.945	3.963	3.960	3.928	0.567
9 PFDS	4.045	4.027	4.040	4.068	4.058	4.059	4.068	Disabled	Disabled	Disabled	4.051	0.379
D 52 13C7_PFUdA	4.062	4.044	4.058	4.085	4.076	4.068	4.086	4.098	4.106	4.120	4.080	0.575
D 60 d5-EtFOSAA	4.062	4.044	4.058	4.094	4.085	4.076	4.095	4.107	4.115	4.120	4.085	0.622
25 PFUdA	4.062	4.044	4.058	4.085	4.085	4.076	4.086	4.107	4.115	4.120	4.083	0.612
5 N-EtFOSAA	4.071	4.053	4.058	4.094	4.093	4.076	4.095	4.116	4.115	4.129	4.090	0.618
D 61 d7-MeFOSE	4.124	4.106	4.120	4.157	4.147	4.139	4.157	4.169	4.169	4.182	4.146	0.587
32 MeFOSE	4.133	4.115	4.129	4.165	4.156	4.148	4.166	4.178	4.186	4.192	4.156	0.611
D 57 d3-MeFOSA	4.142	4.124	4.138	4.174	4.164	4.156	4.175	4.187	4.196	4.201	4.165	0.613
26 MeFOSA	4.151	4.133	4.138	4.183	4.173	4.156	4.175	4.187	4.196	4.201	4.169	0.568
31 11Cl-PF3OUDS	4.206	4.178	4.191	4.233	4.221	4.213	4.234	4.237	4.247	4.252	4.221	0.570
D 62 d9-EtFOSE	4.287	4.267	4.282	4.324	4.313	4.304	4.314	4.328	4.338	4.342	4.309	0.579
33 EtFOSE	4.298	4.277	4.292	4.334	4.323	4.314	4.335	4.338	4.347	4.352	4.321	0.576
D 59 d5-EtFOSA	4.308	4.287	4.302	4.344	4.333	4.314	4.335	4.347	4.357	4.361	4.328	0.571
27 EtFOSA	4.318	4.287	4.302	4.344	4.342	4.324	4.344	4.357	4.357	4.370	4.334	0.599
D 38 13C2_PFDoA	4.328	4.307	4.322	4.363	4.352	4.344	4.363	4.375	4.375	4.386	4.351	0.592
11 PFDoA	4.338	4.307	4.322	4.363	4.352	4.344	4.363	4.375	4.375	4.386	4.352	0.572
4 10:2 FTS	4.347	4.317	4.332	4.372	4.370	4.353	4.372	4.383	4.390	4.394	4.363	0.569
34 PFDOS	4.544	4.508	4.513	4.566	4.565	4.541	4.566	4.569	4.577	4.582	4.553	0.565
24 PFTrDA	4.561	4.535	4.549	4.591	4.590	4.574	4.591	4.594	4.602	4.607	4.579	0.531
D 42 13C2_PFTeDA	4.769	4.728	4.738	4.792	4.786	4.766	4.792	4.794	4.800	4.803	4.776	0.546
23 PFTeDA	4.769	4.735	4.738	4.792	4.786	4.766	4.792	4.794	4.800	4.803	4.777	0.516
D 40 13C2_PFHxDA	5.128	5.081	5.091	5.145	5.139	5.115	5.145	5.146	5.152	5.156	5.130	0.509
35 PFHxDA	5.128	5.081	5.091	5.151	5.145	5.121	5.145	5.146	5.152	5.156	5.131	0.517
36 PFODA	5.489	5.440	5.444	5.514	5.507	5.472	5.507	5.502	5.517	5.514	5.490	0.531

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B017.d
Injection Date: 22-Jul-2021 23:17:47 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 1 Auto Sampler: 1
Sample Info: F.L ICAL 50_SVLC-1545A Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.749	1.743	1	546861	19	>100:1			1000.00	991.78	97.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.749	1.749	1/0	27792	19	25:1			50.000	52.704		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.045	1	511058	15	>100:1			1000.00	989.77	97.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.045	1/0	29191	12	47:1			50.000	53.821		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.087	2.087	1	168570	14	>100:1			1000.00	971.21	99.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.098	2.087	1/0	10295	13	76:1	Target = 3.42		44.200	47.235		
298.9 > 99	44	2.087	2.087		2849	16	24:1	3.61 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.370	2.361	1/0	8230	20	72:1	Target = 2.97		46.900	52.235		
349 > 99	44	2.362	2.361		2543	15	28:1	3.23 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.317	2.308	1	100328	16	>100:1			5000.00	5032.54	111.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.326	2.317	1/0	1846	22	16:1	Target = 1.63		46.700	45.540		
327 > 81	63	2.335	2.317		2065	15	21:1	0.89 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.353	2.343	1	606218	17	>100:1			1000.00	1005.22	101	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.353	2.343	1/0	34447	16	52:1	Target = 18.20		50.000	55.587		
313 > 119	49	2.362	2.343		2455	17	14:1	14.03 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.451	2.441	1	1060670	17	>100:1			5000.00	4980.35	106	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.451	2.441	1/0	14733	14	36:1	Target = 0.78		100.00	100.86		
285 > 185	66	2.451	2.441		19819	15	49:1	0.74 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.681	2.672	1	491967	18	>100:1			1000.00	1014.40	101.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.681	2.672	1/0	31646	18	60:1	Target = 3.72		50.000	57.361		
363 > 169	47	2.681	2.672		8485	21	33:1	3.72 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.690	2.681	1	146484	17	>100:1			1000.00	1054.74	106.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.690	2.681	1/0	7473	20	>100:1	Target = 3.04		45.500	47.640		M
399 > 99	45	2.690	2.681		2480	32	12:1	3.01 (1.52-4.56)	0.27				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.718	2.708	1/0	46865	14	100:1	Target = 3.02		47.100	51.282		
377 > 85	45	2.718	2.708		15576	15	55:1	3.00 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.047	3.032	1/0	7479	25		Target = 3.10		47.600	52.057		
449 > 99	45	3.041	3.032		2715	16	22:1	2.75 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.020	3.005	1	80931	21	>100:1			5000.00	5160.51	104.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.012	3.005	1/0	5403	15	82:1	Target = 1.81		47.400	118.35		M
427 > 81	64	3.020	3.005		2285	14	12:1	2.36 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.041	3.025	1	507486	21	>100:1			1000.00	1025.72	94.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.047	3.025	2/1	25772	20	22:1	Target = 2.85		50.000	53.488		
413 > 169	53	3.041	3.025		9609	17	46:1	2.68 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.403	3.394	1	136560	20	>100:1			1000.00	980.50	97.5	M
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.411	3.394	2/1	10003	41	46:1	Target = 3.31	0.14	46.400	49.390		M
499 > 99	54	3.411	3.394		2892	33		3.45 (1.65-4.96)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.609	3.606	1/0	23474	19	>100:1			46.600	47.670		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.746	3.744	1/0	5806	23	44:1	Target = 2.73		48.000	53.371		
549 > 99	54	3.746	3.744		2449	22		2.37 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.045	4.058	0/-1	7201	18		Target = 2.65		48.200	62.241		
599 > 99	54	4.045	4.058		2409	10	15:1	2.98 (1.32-3.98)					M
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.206	4.221	0/-1	21897	12	>100:1			47.100	49.824		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.544	4.565	-1/-2	6356	14	81:1	Target = 3.07		48.400	55.563		
699 > 99	54	4.544	4.565		1775	18	19:1	3.58 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.418	3.401	2	625469	20	>100:1			1000.00	1026.72	101.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.411	3.401	1/-1	37873	17	56:1	Target = 6.36		50.000	57.474		M
463 > 169	56	3.411	3.401		5177	16	41:1	7.31 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.705	3.710	0	274883	20	>100:1			1000.00	1029.60	109.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.719	3.710	1/1	15188	24	69:1	Target = 37.21		50.000	51.720		
498>478	55	3.733	3.710		217	13		69.99 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.753	3.751	1	89004	18	>100:1			5000.00	5258.39	123.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.760	3.758	1/0	1907	20		Target = 1.87		47.900	46.626		
527 > 81	65	3.746	3.758		1209	13	13:1	1.57 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.347	4.370	-1/-2	3400	20		Target = 3.27		48.200	46.119		
627 > 80	65	4.347	4.370		1044	19	19:1	3.25 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.753	3.758	0	603465	18	>100:1			1000.00	1023.07	102.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.760	3.758	1/1	33854	16	37:1	Target = 13.00		50.000	52.635		
513 > 169	51	3.760	3.758		3362	14	51:1	10.06 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.912	3.917	0	652831	18	>100:1			5000.00	4890.69	108.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.912	3.926	0/0	6411	24	25:1	Target = 1.39		50.000	62.840		M
570 > 483	58	3.904	3.926		3706	24	21:1	1.72 (0.69-2.09)	0.13				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.062	4.076	0	704613	16	>100:1			1000.00	1072.67	99.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.062	4.085	-1/-1	28941	20	77:1	Target = 13.51		50.000	46.435		
563 > 169	52	4.071	4.085		2841	20	12:1	10.18 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.062	4.085	-1	597877	16	>100:1			5000.00	5202.09	114.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.071	4.093	-1/0	7168	27	50:1	Target = 1.80	0.21	50.000	60.417		M
584 > 526	60	4.053	4.093		2083	11	15:1	3.44 (0.90-2.70)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.124	4.147	-1	72578	14	>100:1			1000.00	966.19	106.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.133	4.156	-1/0	4353	18	21:1			50.000	52.469		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.142	4.164	-1	45910	14	27:1			1000.00	933.17	112.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.151	4.173	-1/0	1642	10	15:1	Target = 1.02		50.000	36.344		M
512 > 219	57	4.142	4.173		1882	21	13:1	0.87 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.287	4.313	-1	83206	14	>100:1			1000.00	1062.94	121.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.298	4.323	-1/0	5313	13	56:1			50.000	53.592		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.308	4.333	-1	36807	13	>100:1			1000.00	885.93	96.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.318	4.342	-1/0	2740	18	13:1	Target = 0.97		50.000	49.888		
526 > 219	59	4.318	4.342		3046	18	23:1	0.89 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.328	4.352	-1	750529	14	>100:1			1000.00	1010.92	100.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.338	4.352	0/1	45147	14	18:1	Target = 11.10		50.000	59.386		
613 > 169	38	4.338	4.352		2594	22		17.40 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.561	4.590	-1/0	32464	14	>100:1	Target = 7.97		50.000	53.854		
663 > 169	38	4.561	4.590		3979	16	42:1	8.15 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.769	4.786	-1	857358	18	>100:1			1000.00	979.81	101.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.769	4.786	-1/0	37529	19	>100:1	Target = 11.40		50.000	54.338		
713 > 169	42	4.769	4.786		3177	14	83:1	11.81 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.128	5.139	0	813944	21	>100:1			1000.00	972.36	105.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.128	5.145	0/0	29838	20	99:1	Target = 10.50		50.000	61.349		
813 > 269	40	5.134	5.145		2572	17	48:1	11.60 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.489	5.507	-1/-1	41070	25	>100:1	Target = 13.22		50.000	55.370		
913 > 319	40	5.489	5.507		2843	21	50:1	14.44 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.760	3.758	1	664657	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.353	2.343	1	625107	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.041	3.025	1	529331	20	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.749	1.743	1	495400	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.411	3.394	2	137646	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B018.d
Injection Date: 22-Jul-2021 23:28:24 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 2 Auto Sampler: 2
Sample Info: F.L. ICAL 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.749	1.743	1	611000	20	>100:1			1000.00	1108.10	108.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.756	1.749	1/0	61406	21	53:1			100.00	104.22		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.045	2.045	1	575526	15	>100:1			1000.00	1114.63	109.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.045	2.045	1/0	63829	15	96:1			100.00	104.50		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.077	2.087	0	196377	14	>100:1			1000.00	1131.42	116	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.077	2.087	0/0	21796	14	>100:1	Target = 3.42		88.400	85.843		
298.9 > 99	44	2.077	2.087		6784	14	50:1	3.21 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.353	2.361	0/0	16071	22	>100:1	Target = 2.97		93.800	87.558		
349 > 99	44	2.353	2.361		5542	14	94:1	2.89 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.300	2.308	0	110814	16	>100:1			5000.00	5558.53	122.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.300	2.317	-1/-1	4178	19		Target = 1.63		93.400	93.315		
327 > 81	63	2.308	2.317		4071	24	23:1	1.02 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.326	2.343	-1	659089	16	>100:1			1000.00	1092.89	109.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.326	2.343	-1/0	63935	17	99:1	Target = 18.20		100.00	94.896		
313 > 119	49	2.335	2.343		4870	12	38:1	13.12 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.424	2.441	-1	1201204	17	>100:1			5000.00	5640.23	120	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.424	2.441	-1/0	33958	14	81:1	Target = 0.78		200.00	205.28		
285 > 185	66	2.424	2.441		43999	15	>100:1	0.77 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.645	2.672	-1	543255	18	>100:1			1000.00	1120.15	112.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.654	2.672	-1/0	64035	17	>100:1	Target = 3.72		100.00	105.11		
363 > 169	47	2.645	2.672		17656	18	66:1	3.62 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.654	2.681	-1	153093	18	>100:1			1000.00	1102.33	111.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.654	2.681	-1/0	15120	22	>100:1	Target = 3.04	0.16	91.000	92.229		
399 > 99	45	2.654	2.681		5305	20	39:1	2.85 (1.52-4.56)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.681	2.708	-1/0	88846	18	>100:1	Target = 3.02		94.200	93.023		
377 > 85	45	2.681	2.708		30322	15	94:1	2.93 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.006	3.032	-1/0	14221	20	>100:1	Target = 3.10		95.200	94.711		
449 > 99	45	3.012	3.032		4658	23	31:1	3.05 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		2.981	3.005	-1	86531	22	>100:1			5000.00	5517.59	111.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	2.975	3.005	-1/0	5864	16		Target = 1.81		94.800	120.14		M
427 > 81	64	2.987	3.005		3657	27	20:1	1.60 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.006	3.025	-1	557306	21	>100:1			1000.00	1126.41	103.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.012	3.025	0/1	53189	22	54:1	Target = 2.85		100.00	100.52		
413 > 169	53	3.006	3.025		17647	20	>100:1	3.01 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.374	3.394	-1	157938	20				1000.00	1134.00	112.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.374	3.394	-1/0	18423	42	>100:1	Target = 3.31	0.15	92.800	89.066		M
499 > 99	54	3.374	3.394		6132	33	55:1	3.00 (1.65-4.96)	0.16				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.585	3.606	-1/0	48365	18	>100:1			93.200	84.923		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.726	3.744	-1/0	11055	23		Target = 2.73		96.000	87.867		
549 > 99	54	3.719	3.744		3695	23	20:1	2.99 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.027	4.058	-1/0	10295	19		Target = 2.65		96.400	78.629		
599 > 99	54	4.027	4.058		4861	19		2.11 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.178	4.221	-2/-1	45501	18	>100:1			94.200	89.518		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.508	4.565	-3/-2	10524	15	>100:1	Target = 3.07		96.800	79.546		
699 > 99	54	4.508	4.565		3791	13		2.77 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.381	3.401	-1	675477	21	>100:1			1000.00	1108.81	109.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.381	3.401	-1/0	73475	18	>100:1	Target = 6.36		100.00	103.25		
463 > 169	56	3.374	3.401		11789	18	81:1	6.23 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.679	3.710	-1	295385	20	>100:1			1000.00	1106.40	118.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													a
498 > 78	55	3.679	3.710	-1/0	34015	20	>100:1	Target = 37.21		100.00	107.79		
498>478	55	3.698	3.710		650	16		52.33 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.726	3.751	-1	96102	20	>100:1			5000.00	5677.74	133.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.733	3.758	-1/0	3808	20	9.6:1	Target = 1.87		95.800	86.229		
527 > 81	65	3.726	3.758		2509	29		1.51 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.317	4.370	-3/-2	6489	14	85:1	Target = 3.27		96.400	81.518		M
627 > 80	65	4.317	4.370		3654	19	51:1	1.77 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.733	3.758	-1	657693	19	>100:1			1000.00	1115.01	111.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.733	3.758	-1/0	71781	18	>100:1	Target = 13.00		100.00	102.40		
513 > 169	51	3.739	3.758		4991	24		14.38 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.887	3.917	-1	681319	18	>100:1			5000.00	5104.11	113.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.895	3.926	-1/0	11955	34	87:1	Target = 1.39	0.13	100.00	112.28		
570 > 483	58	3.895	3.926		8733	36	29:1	1.36 (0.69-2.09)	0.30				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.044	4.076	-1	715580	16	>100:1			1000.00	1089.37	101.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.044	4.085	-2/-1	68864	14	>100:1	Target = 13.51		100.00	108.80		
563 > 169	52	4.053	4.085		4992	23	31:1	13.79 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.044	4.085	-2	660852	17	>100:1			5000.00	5750.03	126.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.053	4.093	-2/0	12711	28	80:1	Target = 1.80	0.10	100.00	96.929		M
584 > 526	60	4.044	4.093		7712	35	34:1	1.64 (0.90-2.70)	0.34				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.106	4.147	-2	83393	15	>100:1			1000.00	1110.16	122.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.115	4.156	-2/0	9256	21	41:1			100.00	97.099		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.124	4.164	-2	50868	14	>100:1			1000.00	1033.95	124.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.133	4.173	-2/0	4660	19	34:1	Target = 1.02		100.00	93.092		
512 > 219	57	4.124	4.173		4396	19	27:1	1.06 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.267	4.313	-2	83324	15	>100:1			1000.00	1064.45	121.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.277	4.323	-2/0	9972	23	>100:1			100.00	100.44		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.287	4.333	-2	47134	12	>100:1			1000.00	1134.50	124	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.287	4.342	-3/-1	6297	13	42:1	Target = 0.97		100.00	106.64		
526 > 219	59	4.287	4.342		5532	12	16:1	1.13 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.307	4.352	-2	764375	15	>100:1			1000.00	1029.56	102.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.307	4.352	-2/0	80088	21	28:1	Target = 11.10		100.00	103.44		
613 > 169	38	4.307	4.352		6957	11	29:1	11.51 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.535	4.590	-3/-1	67955	16	>100:1	Target = 7.97		100.00	110.69		
663 > 169	38	4.535	4.590		8152	20	50:1	8.33 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.728	4.786	-3	906057	18	>100:1			1000.00	1035.46	107.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.735	4.786	-3/0	77621	17	>100:1	Target = 11.40		100.00	106.35		
713 > 169	42	4.728	4.786		6395	17	>100:1	12.13 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.081	5.139	-3	874055	22	>100:1			1000.00	1044.17	113.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.081	5.145	-3/0	57181	21	>100:1	Target = 10.50		100.00	109.48		
813 > 269	40	5.081	5.145		5150	22	>100:1	11.10 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.440	5.507	-4/-1	79165	21	>100:1	Target = 13.22		100.00	99.390		
913 > 319	40	5.447	5.507		6441	25	>100:1	12.29 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.733	3.758	-1	698745	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.326	2.343	-1	644196	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.006	3.025	-1	570233	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.749	1.743	1	543881	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.374	3.394	-1	151522	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B019.d
Injection Date: 22-Jul-2021 23:38:59 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 3 Auto Sampler: 3
Sample Info: F.L. ICAL 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.742	1.743	0	599976	20	>100:1			1000.00	1088.11	106.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.749	1.749	0/0	116299	20	>100:1			200.00	201.02		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.045	1	551519	14	>100:1			1000.00	1068.14	105.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.055	2.045	1/0	116903	14	>100:1			200.00	199.73		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.087	2.087	0	187768	21	>100:1			1000.00	1081.82	110.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.087	2.087	0/0	43255	14	>100:1	Target = 3.42		176.80	178.17		
298.9 > 99	44	2.087	2.087		13289	16	81:1	3.25 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.370	2.361	1/1	31748	15	>100:1	Target = 2.97		187.60	180.90		
349 > 99	44	2.370	2.361		10523	21	81:1	3.01 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.316	2.308	1	107529	22	>100:1			5000.00	5393.75	119.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.316	2.317	0/-1	7049	14	>100:1	Target = 1.63		186.80	162.25		M
327 > 81	63	2.316	2.317		5207	13	41:1	1.35 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.352	2.343	1	647271	17	>100:1			1000.00	1073.30	107.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.352	2.343	1/0	143111	16	>100:1	Target = 18.20		200.00	216.29		
313 > 119	49	2.352	2.343		5711	13	49:1	25.05 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.450	2.441	1	1180333	17	>100:1			5000.00	5542.23	118	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.450	2.441	1/0	67171	21	>100:1	Target = 0.78		400.00	413.24		
285 > 185	66	2.450	2.441		84344	17	>100:1	0.79 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.681	2.672	1	527406	18	>100:1			1000.00	1087.47	109.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.681	2.672	1/0	119317	17	>100:1	Target = 3.72		200.00	201.74		
363 > 169	47	2.681	2.672		29545	20	>100:1	4.03 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.690	2.681	1	151195	17	>100:1			1000.00	1088.66	109.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.690	2.681	1/0	27748	26	>100:1	Target = 3.04	0.19	182.00	171.38		M
399 > 99	45	2.690	2.681		9428	30	50:1	2.94 (1.52-4.56)	0.09				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.717	2.708	1/0	179931	18	>100:1	Target = 3.02		188.40	190.75		
377 > 85	45	2.717	2.708		57648	16	>100:1	3.12 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.038	3.032	1/0	28597	21	>100:1	Target = 3.10		190.40	192.85		
449 > 99	45	3.038	3.032		7992	28	>100:1	3.57 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.011	3.005	1	91676	28	>100:1			5000.00	5845.65	118.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.011	3.005	1/0	12135	16	>100:1	Target = 1.81		189.60	234.66		M
427 > 81	64	3.017	3.005		7571	26	48:1	1.60 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.032	3.025	1	550354	22	>100:1			1000.00	1112.36	102.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.038	3.025	1/0	106595	23	83:1	Target = 2.85		200.00	204.00		
413 > 169	53	3.038	3.025		40370	21	>100:1	2.64 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.394	3.394	0	156053	20	>100:1			1000.00	1120.46	111.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.401	3.394	1/1	28989	38		Target = 3.31	0.30	185.60	152.26		M
499 > 99	54	3.401	3.394		9581	38	76:1	3.02 (1.65-4.96)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.598	3.606	0/0	100658	16	>100:1			186.40	178.88		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.737	3.744	0/0	24413	25	>100:1	Target = 2.73		192.00	196.38		
549 > 99	54	3.730	3.744		7364	15	34:1	3.31 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.040	4.058	-1/-1	23053	13		Target = 2.65		192.80	187.26		
599 > 99	54	4.040	4.058		6908	14	67:1	3.33 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.191	4.221	-1/-1	88510	15	>100:1			188.40	176.24		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.513	4.565	-3/-3	23813	13	>100:1	Target = 3.07		193.60	182.17		
699 > 99	54	4.513	4.565		7698	17	>100:1	3.09 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.401	3.401	0	642980	21	>100:1			1000.00	1055.46	103.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.408	3.401	1/1	135915	18	>100:1	Target = 6.36		200.00	200.64		
463 > 169	56	3.401	3.401		22291	18	>100:1	6.09 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.695	3.710	0	289667	21	>100:1			1000.00	1084.98	115.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													a
498 > 78	55	3.695	3.710	0/0	57446	24	>100:1	Target = 37.21		200.00	185.64		
498>478	55	3.677	3.710		1657	15	13:1	34.66 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.737	3.751	0	96830	19				5000.00	5720.75	134.1	M
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.744	3.758	0/0	9885	17	>100:1	Target = 1.87		191.60	222.16		
527 > 81	65	3.744	3.758		4985	22		1.98 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.332	4.370	-2/-2	19872	11		Target = 3.27		192.80	247.76		M
627 > 80	65	4.332	4.370		5270	16		3.77 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.744	3.758	0	665774	19	>100:1			1000.00	1128.71	112.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.751	3.758	0/0	148329	18	>100:1	Target = 13.00		200.00	209.03		
513 > 169	51	3.751	3.758		11169	24	85:1	13.28 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.901	3.917	-1	738360	18	>100:1			5000.00	5531.43	122.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.909	3.926	-1/0	19524	32	>100:1	Target = 1.39	0.16	200.00	169.20		M
570 > 483	58	3.909	3.926		16147	30		1.20 (0.69-2.09)	0.26				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.058	4.076	-1	747498	16	>100:1			1000.00	1137.96	105.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.058	4.085	-1/0	128315	15	>100:1	Target = 13.51		200.00	194.07		
563 > 169	52	4.058	4.085		10381	19	57:1	12.36 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.058	4.085	-1	654230	17	>100:1			5000.00	5692.41	125.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.058	4.093	-2/-1	23367	30	>100:1	Target = 1.80	0.16	200.00	179.99		
584 > 526	60	4.058	4.093		12207	28	92:1	1.91 (0.90-2.70)	0.17				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.120	4.147	-1	78711	17	>100:1			1000.00	1047.83	115.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.129	4.156	-1/0	19866	20	86:1			200.00	220.80		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.138	4.164	-1	49248	14	82:1			1000.00	1001.02	120.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.138	4.173	-2/-1	11430	14	>100:1	Target = 1.02		200.00	235.85		
512 > 219	57	4.146	4.173		11619	19	>100:1	0.98 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.282	4.313	-1	80115	15	>100:1			1000.00	1023.45	117	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.292	4.323	-1/0	23393	16	>100:1			200.00	245.07		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.302	4.333	-1	45769	14	>100:1			1000.00	1101.64	120.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.302	4.342	-2/-1	9794	15	77:1	Target = 0.97		200.00	183.76		
526 > 219	59	4.312	4.342		10548	19	57:1	0.92 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.322	4.352	-1	823994	14	>100:1			1000.00	1109.87	110.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.322	4.352	-1/0	167068	21	55:1	Target = 11.10		200.00	200.17		
613 > 169	38	4.322	4.352		17731	20	>100:1	9.42 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.549	4.590	-2/-1	131129	17	>100:1	Target = 7.97		200.00	198.13		
663 > 169	38	4.540	4.590		16367	21	>100:1	8.01 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.738	4.786	-2	909992	18	>100:1			1000.00	1039.96	107.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.738	4.786	-2/0	149560	17	>100:1	Target = 11.40		200.00	204.02		
713 > 169	42	4.738	4.786		13699	18	>100:1	10.91 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.091	5.139	-2	869763	22	>100:1			1000.00	1039.04	113.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.091	5.145	-3/-1	107761	21	>100:1	Target = 10.50		200.00	207.35		
813 > 269	40	5.091	5.145		11802	27	>100:1	9.13 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.444	5.507	-3/-1	162312	21	>100:1	Target = 13.22		200.00	204.78		
913 > 319	40	5.444	5.507		11879	21	>100:1	13.66 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.744	3.758	0	719376	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.352	2.343	1	668847	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.038	3.025	1	575643	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.749	1.743	1	539827	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.401	3.394	1	150490	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B020.d
Injection Date: 22-Jul-2021 23:49:35 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 4 Auto Sampler: 4
Sample Info: F.L. ICAL 500_SVLC-1548 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.749	1.743	1	573156	19	>100:1			1000.00	1039.47	101.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.756	1.749	1/0	280637	19	>100:1			500.00	507.77		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.045	2.045	1	531930	14	>100:1			1000.00	1030.20	101.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.045	2.045	1/0	278776	14	>100:1			500.00	493.82		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.077	2.087	0	178777	16	>100:1			1000.00	1030.02	105.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.077	2.087	0/0	101809	16	>100:1	Target = 3.42		442.00	440.45		
298.9 > 99	44	2.077	2.087		28981	15	>100:1	3.51 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.353	2.361	0/0	80873	16	>100:1	Target = 2.97		469.00	483.99		
349 > 99	44	2.344	2.361		25826	20	>100:1	3.13 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.300	2.308	0	109742	17	>100:1			5000.00	5504.75	121.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.300	2.317	-1/-1	19995	16		Target = 1.63		467.00	450.95		
327 > 81	63	2.300	2.317		11289	17	>100:1	1.77 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.326	2.343	-1	645478	17	>100:1			1000.00	1070.32	107.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.326	2.343	-1/0	325914	17	>100:1	Target = 18.20		500.00	493.94		
313 > 119	49	2.335	2.343		16478	16	>100:1	19.77 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.424	2.441	-1	1123208	16	>100:1			5000.00	5274.00	112.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.424	2.441	-1/0	147510	15	>100:1	Target = 0.78		1000.00	953.64		
285 > 185	66	2.424	2.441		195020	16	>100:1	0.75 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.645	2.672	-1	513243	19	>100:1			1000.00	1058.27	106.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.645	2.672	-1/0	290119	18	>100:1	Target = 3.72		500.00	504.06		
363 > 169	47	2.645	2.672		78656	18	>100:1	3.68 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.654	2.681	-1	150796	18	>100:1			1000.00	1085.79	109.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.654	2.681	-1/0	71564	24	>100:1	Target = 3.04	0.18	455.00	443.17		
399 > 99	45	2.663	2.681		25220	24	>100:1	2.83 (1.52-4.56)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.681	2.708	-1/0	425708	18	>100:1	Target = 3.02		471.00	452.51		
377 > 85	45	2.681	2.708		140931	23	>100:1	3.02 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.018	3.032	0/1	65425	21	>100:1	Target = 3.10		476.00	442.36		
449 > 99	45	3.012	3.032		19980	19	>100:1	3.27 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		2.987	3.005	-1	80223	23	>100:1			5000.00	5115.36	103.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	2.987	3.005	-1/0	21797	19	>100:1	Target = 1.81		474.00	481.67		M
427 > 81	64	2.987	3.005		10973	30		1.98 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.012	3.025	0	515742	23	>100:1			1000.00	1042.40	95.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.012	3.025	0/0	247969	22	>100:1	Target = 2.85		500.00	506.40		
413 > 169	53	3.012	3.025		82182	21	>100:1	3.01 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.394	3.394	1	136027	20	>100:1			1000.00	976.68	97.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.394	3.394	1/0	73628	41	83:1	Target = 3.31	0.30	464.00	477.29		M
499 > 99	54	3.394	3.394		21736	39		3.38 (1.65-4.96)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.615	3.606	1/0	243770	20	>100:1			466.00	496.97		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.752	3.744	1/0	52773	18	>100:1	Target = 2.73		480.00	487.02		
549 > 99	54	3.759	3.744		20858	24	94:1	2.53 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.068	4.058	1/0	49606	17		Target = 2.65		482.00	472.77		
599 > 99	54	4.068	4.058		21933	15	70:1	2.26 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.233	4.221	1/0	222145	15	>100:1			471.00	507.44		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.566	4.565	1/0	55986	17	>100:1	Target = 3.07		484.00	491.34		
699 > 99	54	4.566	4.565		20144	16	>100:1	2.77 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.402	3.401	1	626954	20	>100:1			1000.00	1029.16	101.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.402	3.401	1/0	317292	20	>100:1	Target = 6.36		500.00	480.37		
463 > 169	56	3.402	3.401		51459	20	>100:1	6.16 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.717	3.710	1	269529	21	>100:1			1000.00	1009.55	107.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.717	3.710	1/0	141156	19	>100:1	Target = 37.21		500.00	490.23		
498>478	55	3.710	3.710		5091	25	33:1	27.72 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.759	3.751	1	86993	23				5000.00	5139.58	120.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.759	3.758	1/0	18869	23	>100:1	Target = 1.87		479.00	472.01		
527 > 81	65	3.759	3.758		9699	16	92:1	1.94 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.372	4.370	1/0	35343	19	>100:1	Target = 3.27		482.00	490.49		
627 > 80	65	4.372	4.370		10601	14	>100:1	3.33 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.766	3.758	1	609348	18	>100:1			1000.00	1033.04	103.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.766	3.758	1/0	331458	19	>100:1	Target = 13.00		500.00	510.37		
513 > 169	51	3.766	3.758		22695	19	>100:1	14.60 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.918	3.917	1	615697	17	>100:1			5000.00	4612.50	102.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.926	3.926	1/0	42880	24	72:1	Target = 1.39	0.09	500.00	445.66		
570 > 483	58	3.934	3.926		33041	27	21:1	1.29 (0.69-2.09)	0.19				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.085	4.076	1	633789	16	>100:1			1000.00	964.85	89.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.085	4.085	1/0	309901	16	>100:1	Target = 13.51		500.00	552.79		
563 > 169	52	4.085	4.085		21213	13	>100:1	14.60 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.094	4.085	1	602499	17	>100:1			5000.00	5242.30	115.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.094	4.093	1/0	52259	22	26:1	Target = 1.80	0.11	500.00	437.10		
584 > 526	60	4.094	4.093		37732	30	78:1	1.38 (0.90-2.70)	0.21				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.157	4.147	1	74423	16	>100:1			1000.00	990.75	109	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.165	4.156	1/0	38234	15	>100:1			500.00	449.43		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.174	4.164	1	47465	17	10:1			1000.00	964.78	116.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.183	4.173	1/0	26282	14	>100:1	Target = 1.02		500.00	562.67		
512 > 219	57	4.183	4.173		21505	16	>100:1	1.22 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.324	4.313	1	80042	16	>100:1			1000.00	1022.52	116.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.334	4.323	1/0	47049	19				500.00	493.34		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.344	4.333	1	40038	17	>100:1			1000.00	963.70	105.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.344	4.342	1/0	18736	13	>100:1	Target = 0.97		500.00	427.41		
526 > 219	59	4.344	4.342		20655	15	>100:1	0.90 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.363	4.352	1	766014	16				1000.00	1031.77	102.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.363	4.352	1/0	402824	15	>100:1	Target = 11.10		500.00	519.16		
613 > 169	38	4.363	4.352		37742	16	>100:1	10.67 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.591	4.590	1/0	306490	15	>100:1	Target = 7.97		500.00	498.15		
663 > 169	38	4.591	4.590		40202	17	>100:1	7.62 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.792	4.786	1	885835	20	>100:1			1000.00	1012.35	104.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.792	4.786	1/0	365502	19	>100:1	Target = 11.40		500.00	512.20		
713 > 169	42	4.792	4.786		32176	17	>100:1	11.35 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.145	5.139	1	879100	21	>100:1			1000.00	1050.20	114.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.151	5.145	1/0	257580	22	>100:1	Target = 10.50		500.00	490.35		
813 > 269	40	5.145	5.145		23774	20	>100:1	10.83 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.514	5.507	1/0	393842	23	>100:1	Target = 13.22		500.00	491.62		
913 > 319	40	5.507	5.507		29266	22	>100:1	13.45 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.766	3.758	1	661837	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.326	2.343	-1	652725	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.012	3.025	0	538819	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.749	1.743	1	529552	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.394	3.394	1	136409	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B021.d
Injection Date: 23-Jul-2021 00:00:15 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 5 Auto Sampler: 5
Sample Info: F.L. ICAL 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.743	1.743	0	563032	20	>100:1			1000.00	1021.11	100	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.749	1.749	0/0	493876	19	>100:1			1000.00	909.67		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.045	2.045	0	523546	15	>100:1			1000.00	1013.96	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.045	2.045	0/0	492704	16	>100:1			1000.00	886.75		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.087	2.087	0	169277	15	>100:1			1000.00	975.29	100	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.087	2.087	0/0	183900	14	>100:1	Target = 3.42		884.00	840.24		
298.9 > 99	44	2.087	2.087		52254	17	>100:1	3.51 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.361	2.361	0/0	146874	17	>100:1	Target = 2.97		938.00	928.30		
349 > 99	44	2.361	2.361		53565	16	>100:1	2.74 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.308	2.308	0	90196	18	>100:1			5000.00	4524.31	100	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.317	2.317	0/0	36192	23	>100:1	Target = 1.63		934.00	993.13		
327 > 81	63	2.317	2.317		21722	17	>100:1	1.66 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.343	2.343	0	600114	16	>100:1			1000.00	995.10	100	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.343	2.343	0/0	563542	16	>100:1	Target = 18.20		1000.00	918.64		
313 > 119	49	2.343	2.343		28649	17	>100:1	19.67 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.441	2.441	0	1000599	15	>100:1			5000.00	4698.29	100	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.441	2.441	0/0	279651	17	>100:1	Target = 0.78		2000.00	2029.46		
285 > 185	66	2.441	2.441		352691	18	>100:1	0.79 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.672	2.672	0	482787	18	>100:1			1000.00	995.47	100	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.672	2.672	0/0	486690	18	>100:1	Target = 3.72		1000.00	898.93		
363 > 169	47	2.672	2.672		131831	19	>100:1	3.69 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.681	2.681	0	137682	17	>100:1			1000.00	991.36	100	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.681	2.681	0/0	127027	25	>100:1	Target = 3.04	0.18	910.00	861.57		
399 > 99	45	2.681	2.681		41595	24	>100:1	3.05 (1.52-4.56)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.708	2.708	0/0	745736	18	>100:1	Target = 3.02		942.00	868.19		
377 > 85	45	2.708	2.708		242208	18	>100:1	3.07 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.032	3.032	0/0	123362	23		Target = 3.10		952.00	913.55		
449 > 99	45	3.025	3.032		40286	23	>100:1	3.06 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.005	3.005	0	77321	23	>100:1			5000.00	4930.32	100	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.005	3.005	0/0	37216	28	93:1	Target = 1.81		948.00	853.27		
427 > 81	64	3.005	3.005		20401	22	>100:1	1.82 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.025	3.025	0	538966	22	>100:1			1000.00	1089.34	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.025	3.025	0/0	434061	21	>100:1	Target = 2.85		1000.00	848.25		
413 > 169	53	3.032	3.025		150539	21	>100:1	2.88 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.394	3.394	0	139992	21	>100:1			1000.00	1005.15	100	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.394	3.394	0/0	134594	43	>100:1	Target = 3.31	0.26	928.00	861.43		
499 > 99	54	3.394	3.394		39406	42	>100:1	3.41 (1.65-4.96)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.606	3.606	0/0	411563	18	>100:1			932.00	815.29		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.744	3.744	0/0	91668	19	>100:1	Target = 2.73		960.00	822.00		
549 > 99	54	3.751	3.744		36476	20	99:1	2.51 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.058	4.058	0/0	97617	15		Target = 2.65		964.00	910.52		
599 > 99	54	4.058	4.058		37286	14		2.61 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.221	4.221	0/0	399483	15	>100:1			942.00	886.69		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.565	4.565	0/0	104765	15	>100:1	Target = 3.07		968.00	893.39		
699 > 99	54	4.565	4.565		33865	16		3.09 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.401	3.401	0	618881	21	>100:1			1000.00	1015.91	100	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.401	3.401	0/0	584147	21	>100:1	Target = 6.36		1000.00	895.91		
463 > 169	56	3.401	3.401		91773	20	>100:1	6.36 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.710	3.710	0	250019	21	>100:1			1000.00	936.47	100	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.710	3.710	0/0	272690	21	>100:1	Target = 37.21		1000.00	1020.95		
498>478	55	3.710	3.710		9577	19		28.47 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.751	3.751	0	72182	19				5000.00	4264.54	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.758	3.758	0/0	36269	25		Target = 1.87		958.00	1093.45		
527 > 81	65	3.751	3.758		18422	16		1.96 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.370	4.370	0/0	65175	15		Target = 3.27		964.00	1090.08		M
627 > 80	65	4.370	4.370		20389	17	>100:1	3.19 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.758	3.758	0	590501	19	>100:1			1000.00	1001.09	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.758	3.758	0/0	577932	20	>100:1	Target = 13.00		1000.00	918.28		
513 > 169	51	3.758	3.758		43271	17	>100:1	13.35 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.917	3.917	0	601725	19	>100:1			5000.00	4507.83	100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.926	3.926	0/0	92901	30	>100:1	Target = 1.39	0.09	1000.00	987.95		M
570 > 483	58	3.926	3.926		63966	36	>100:1	1.45 (0.69-2.09)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.076	4.076	0	707587	16	>100:1			1000.00	1077.20	100	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.085	4.085	0/0	552500	15	>100:1	Target = 13.51		1000.00	882.75		
563 > 169	52	4.076	4.085		37583	17	>100:1	14.70 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.085	4.085	0	521292	15	>100:1			5000.00	4535.73	100	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.093	4.093	0/0	100636	30	>100:1	Target = 1.80		1000.00	972.86		M
584 > 526	60	4.085	4.093		69530	30	>100:1	1.44 (0.90-2.70)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.147	4.147	0	68295	16	>100:1			1000.00	909.17	100	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.156	4.156	0/0	76750	15	>100:1			1000.00	983.13		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.164	4.164	0	40777	20	35:1			1000.00	828.84	100	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.173	4.173	0/0	43643	14	>100:1	Target = 1.02		1000.00	1087.61		
512 > 219	57	4.173	4.173		43077	15	>100:1	1.01 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.313	4.313	0	68452	13	>100:1			1000.00	874.46	100	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.323	4.323	0/0	82167	13	>100:1			1000.00	1007.45		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.333	4.333	0	38025	13	>100:1			1000.00	915.25	100	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.342	4.342	0/0	41626	19	>100:1	Target = 0.97		1000.00	1028.68		
526 > 219	59	4.342	4.342		46604	19	>100:1	0.89 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.352	4.352	0	745164	15	>100:1			1000.00	1003.69	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.352	4.352	0/0	702228	15	>100:1	Target = 11.10		1000.00	930.36		
613 > 169	38	4.352	4.352		70091	14	>100:1	10.01 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.590	4.590	0/0	559645	16	>100:1	Target = 7.97		1000.00	935.07		
663 > 169	38	4.590	4.590		69693	14	>100:1	8.03 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.786	4.786	0	846373	20	>100:1			1000.00	967.26	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.786	4.786	0/0	633480	20	>100:1	Target = 11.40		1000.00	929.12		
713 > 169	42	4.786	4.786		56036	19	>100:1	11.30 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.139	5.139	0	768834	21	>100:1			1000.00	918.47	100	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.145	5.145	0/0	448104	20	>100:1	Target = 10.50		1000.00	975.39		
813 > 269	40	5.139	5.145		42867	22	>100:1	10.45 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.507	5.507	0/0	700357	24	>100:1	Target = 13.22		1000.00	999.62		
913 > 319	40	5.507	5.507		52457	23	>100:1	13.35 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.758	3.758	0	592352	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.343	2.343	0	582381	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.025	3.025	0	516348	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.743	1.743	0	474184	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.394	3.394	0	126954	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B022.d
Injection Date: 23-Jul-2021 00:10:49 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 6 Auto Sampler: 6
Sample Info: F.L. ICAL 2000_SVLC-1550 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.743	1.743	1	559024	20	>100:1			1000.00	1013.84	99.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.749	1.749	1/0	1050051	20	>100:1			2000.00	1947.95		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.045	2.045	1	535244	15	>100:1			1000.00	1036.62	102.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.045	2.045	1/0	1145498	15	>100:1			2000.00	2016.57		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.087	2.087	1	176333	14	>100:1			1000.00	1015.94	104.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.087	2.087	1/0	393955	14	>100:1	Target = 3.42		1768.00	1727.96		
298.9 > 99	44	2.087	2.087		114554	14	>100:1	3.43 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.362	2.361	1/0	310342	17	>100:1	Target = 2.97		1876.00	1883.00		
349 > 99	44	2.362	2.361		103056	16	>100:1	3.01 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.308	2.308	1	99931	16	>100:1			5000.00	5012.63	110.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.308	2.317	0/-1	84721	18	>100:1	Target = 1.63		1868.00	2098.31		
327 > 81	63	2.308	2.317		43025	17	>100:1	1.96 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.344	2.343	1	624153	17	>100:1			1000.00	1034.96	104	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.344	2.343	1/0	1269473	17	>100:1	Target = 18.20		2000.00	1989.70		
313 > 119	49	2.344	2.343		67941	15	>100:1	18.68 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.442	2.441	1	1037606	18	>100:1			5000.00	4872.06	103.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.442	2.441	1/0	581605	16	>100:1	Target = 0.78		4000.00	4070.23		
285 > 185	66	2.442	2.441		747214	17	>100:1	0.77 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.672	2.672	1	473643	18	>100:1			1000.00	976.61	98.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.672	2.672	1/0	1024742	18	>100:1	Target = 3.72		2000.00	1929.28		
363 > 169	47	2.672	2.672		276994	17	>100:1	3.69 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.681	2.681	1	146445	18	>100:1			1000.00	1054.46	106.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.681	2.681	1/0	275733	26	>100:1	Target = 3.04	0.20	1820.00	1758.27		
399 > 99	45	2.681	2.681		84304	23	>100:1	3.27 (1.52-4.56)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.709	2.708	1/0	1651909	18	>100:1	Target = 3.02		1884.00	1808.08		
377 > 85	45	2.709	2.708		546161	18	>100:1	3.02 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.039	3.032	1/0	270274	21	>100:1	Target = 3.10		1904.00	1881.73		
449 > 99	45	3.039	3.032		85514	20	>100:1	3.16 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.012	3.005	1	86032	20	>100:1			5000.00	5485.77	111.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.012	3.005	1/0	82312	22		Target = 1.81		1896.00	1696.12		
427 > 81	64	3.012	3.005		41862	20	>100:1	1.96 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.039	3.025	1	487751	21	>100:1			1000.00	985.83	90.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.039	3.025	1/0	943948	22	>100:1	Target = 2.85		2000.00	2038.37		
413 > 169	53	3.039	3.025		351457	21	>100:1	2.68 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.402	3.394	1	144663	19	>100:1			1000.00	1038.68	103.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.409	3.394	1/0	299625	46		Target = 3.31		1856.00	1876.04		M
499 > 99	54	3.402	3.394		87420	38	>100:1	3.42 (1.65-4.96)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.615	3.606	1/0	941910	18	>100:1			1864.00	1805.64		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.752	3.744	1/0	217788	19	>100:1	Target = 2.73		1920.00	1889.87		
549 > 99	54	3.745	3.744		83350	18		2.61 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.059	4.058	1/0	206174	16	>100:1	Target = 2.65		1928.00	1868.46		
599 > 99	54	4.059	4.058		81320	17	>100:1	2.53 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.213	4.221	0/-1	841216	15	>100:1			1884.00	1806.87		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.541	4.565	-1/-2	223941	16	>100:1	Target = 3.07		1936.00	1848.00		
699 > 99	54	4.541	4.565		72836	15		3.07 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.409	3.401	1	632127	19	>100:1			1000.00	1037.65	102.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.409	3.401	1/0	1388347	20	>100:1	Target = 6.36		2000.00	2084.69		
463 > 169	56	3.409	3.401		218146	19	>100:1	6.36 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.710	3.710	1	292812	20				1000.00	1096.76	117.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.710	3.710	1/0	576769	20	>100:1	Target = 37.21		2000.00	1843.82		
498>478	55	3.710	3.710		17631	26	>100:1	32.71 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.752	3.751	1	85033	19	>100:1			5000.00	5023.78	117.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.759	3.758	1/0	81040	19	>100:1	Target = 1.87		1916.00	2073.97		
527 > 81	65	3.752	3.758		39252	20	>100:1	2.06 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.353	4.370	-1/-2	143592	19		Target = 3.27		1928.00	2038.69		M
627 > 80	65	4.353	4.370		39163	14		3.66 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.759	3.758	1	586575	20	>100:1			1000.00	994.44	99.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.759	3.758	1/0	1314178	19	>100:1	Target = 13.00		2000.00	2102.08		
513 > 169	51	3.759	3.758		101063	19	>100:1	13.00 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.918	3.917	1	695403	18	>100:1			5000.00	5209.62	115.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.918	3.926	0/-1	214866	34	>100:1	Target = 1.39	0.08	2000.00	1977.16		M
570 > 483	58	3.918	3.926		154927	31	>100:1	1.38 (0.69-2.09)	0.14				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.068	4.076	0	720614	15	>100:1			1000.00	1097.03	101.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.076	4.085	0/0	1221346	16	>100:1	Target = 13.51		2000.00	1916.11		
563 > 169	52	4.076	4.085		87953	15	>100:1	13.88 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.076	4.085	0	613448	17	>100:1			5000.00	5337.57	117.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.076	4.093	-1/-1	252276	32	>100:1	Target = 1.80		2000.00	2072.40		M
584 > 526	60	4.076	4.093		148049	32	>100:1	1.70 (0.90-2.70)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.139	4.147	0	72557	16				1000.00	965.91	106.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.148	4.156	0/0	181029	15	>100:1			2000.00	2182.69		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.156	4.164	0	50627	14	15:1			1000.00	1029.05	124.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.156	4.173	-1/-1	102425	14	>100:1	Target = 1.02		2000.00	2055.87		
512 > 219	57	4.156	4.173		104281	15	>100:1	0.98 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.304	4.313	0	79874	13	>100:1			1000.00	1020.37	116.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.314	4.323	0/0	178542	16	>100:1			2000.00	1876.06		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.314	4.333	-1	41144	13	>100:1			1000.00	990.32	108.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.324	4.342	-1/0	95844	13	>100:1	Target = 0.97		2000.00	2213.27		
526 > 219	59	4.324	4.342		90265	13	>100:1	1.06 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.344	4.352	0	774776	15	>100:1			1000.00	1043.57	104	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.344	4.352	0/0	1546218	15	>100:1	Target = 11.10		2000.00	1970.23		
613 > 169	38	4.344	4.352		149057	16	>100:1	10.37 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.574	4.590	0/0	1236301	17	>100:1	Target = 7.97		2000.00	1986.69		
663 > 169	38	4.574	4.590		157280	15	>100:1	7.86 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.766	4.786	-1	884540	18	>100:1			1000.00	1010.87	104.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.766	4.786	-1/0	1437780	19	>100:1	Target = 11.40		2000.00	2017.79		
713 > 169	42	4.766	4.786		126512	19	>100:1	11.36 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.115	5.139	-1	848036	21	>100:1			1000.00	1013.09	110.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.121	5.145	-1/0	983802	22	>100:1	Target = 10.50		2000.00	1941.45		
813 > 269	40	5.121	5.145		94552	21	>100:1	10.40 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.472	5.507	-2/-1	1526123	22	>100:1	Target = 13.22		2000.00	1974.79		
913 > 319	40	5.472	5.507		115982	22	>100:1	13.15 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.765	3.758	1	636307	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.344	2.343	1	657478	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.039	3.025	1	530663	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.749	1.743	1	502696	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.402	3.394	1	145871	20							

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B023.d
Injection Date: 23-Jul-2021 00:21:27 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 7 Auto Sampler: 7
Sample Info: F.L. ICAL 5000_SVLC-1551 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.749	1.743	1	540622	19	>100:1			1000.00	980.46	96	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.756	1.749	1/0	2626976	19	>100:1			5000.00	5039.18		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.045	2.045	1	519236	15	>100:1			1000.00	1005.61	99.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.045	2.045	1/0	2810598	14	>100:1			5000.00	5100.40		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.077	2.087	0	182475	16	>100:1			1000.00	1051.33	107.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.077	2.087	0/0	996905	14	>100:1	Target = 3.42		4420.00	4225.43		
298.9 > 99	44	2.077	2.087		288946	13	>100:1	3.45 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.344	2.361	-1/-1	752587	17	>100:1	Target = 2.97		4690.00	4412.61		
349 > 99	44	2.344	2.361		262781	16	>100:1	2.86 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.291	2.308	0	96504	16	>100:1			5000.00	4840.72	107	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.291	2.317	-1/-1	191602	18	>100:1	Target = 1.63		4670.00	4913.99		
327 > 81	63	2.291	2.317		105963	18	>100:1	1.80 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.326	2.343	-1	618656	17	>100:1			1000.00	1025.85	103.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.326	2.343	-1/0	3015523	17	>100:1	Target = 18.20		5000.00	4768.34		
313 > 119	49	2.326	2.343		164494	17	>100:1	18.33 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.415	2.441	-1	1072603	17	>100:1			5000.00	5036.38	107.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.415	2.441	-1/0	1457690	18	>100:1	Target = 0.78		10000	9868.47		
285 > 185	66	2.415	2.441		1815718	17	>100:1	0.80 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.645	2.672	-1	502901	19	>100:1			1000.00	1036.94	104.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.645	2.672	-1/0	2677910	19	>100:1	Target = 3.72		5000.00	4748.37		
363 > 169	47	2.645	2.672		711933	19	>100:1	3.76 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.645	2.681	-2	142331	18	>100:1			1000.00	1024.83	103.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.654	2.681	-1/1	672418	26		Target = 3.04	0.18	4550.00	4411.74		
399 > 99	45	2.654	2.681		206893	26	>100:1	3.25 (1.52-4.56)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.681	2.708	-1/1	4068989	19	>100:1	Target = 3.02		4710.00	4582.40		
377 > 85	45	2.681	2.708		1298705	19	>100:1	3.13 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.012	3.032	-1/1	657184	22	>100:1	Target = 3.10		4760.00	4707.76		
449 > 99	45	3.012	3.032		209075	20	>100:1	3.14 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		2.987	3.005	-1	69383	21	>100:1			5000.00	4424.16	89.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	2.987	3.005	-1/0	181602	21	>100:1	Target = 1.81		4740.00	4640.03		
427 > 81	64	2.987	3.005		99685	23	>100:1	1.82 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.012	3.025	0	513973	22	>100:1			1000.00	1038.83	95.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.012	3.025	0/0	2349164	22	>100:1	Target = 2.85		5000.00	4813.99		
413 > 169	53	3.012	3.025		810609	22	>100:1	2.89 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.402	3.394	1	138558	21	>100:1			1000.00	994.85	99	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.402	3.394	1/0	735624	48	>100:1	Target = 3.31	0.25	4640.00	4836.38		M
499 > 99	54	3.402	3.394		213253	44	>100:1	3.44 (1.65-4.96)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.615	3.606	1/0	2274633	19	>100:1			4660.00	4552.58		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.758	3.744	1/0	528834	19	>100:1	Target = 2.73		4800.00	4791.19		
549 > 99	54	3.752	3.744		195214	18	>100:1	2.70 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.068	4.058	1/0	522072	16	>100:1	Target = 2.65		4820.00	4951.52		
599 > 99	54	4.068	4.058		191914	17	>100:1	2.72 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.234	4.221	1/0	2044902	16	>100:1			4710.00	4585.82		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.566	4.565	1/0	565609	16	>100:1	Target = 3.07		4840.00	4873.16		
699 > 99	54	4.566	4.565		192965	21	>100:1	2.93 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.402	3.401	1	609273	21	>100:1			1000.00	1000.13	98.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.402	3.401	1/0	3110938	21	>100:1	Target = 6.36		5000.00	4846.50		
463 > 169	56	3.402	3.401		484605	21	>100:1	6.41 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.717	3.710	1	260109	20	>100:1			1000.00	974.27	104	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.717	3.710	1/0	1301753	20	>100:1	Target = 37.21		5000.00	4684.68		
498>478	55	3.717	3.710		40339	19	>100:1	32.27 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.758	3.751	1	84351	26	>100:1			5000.00	4983.49	116.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.758	3.758	1/0	187322	21	>100:1	Target = 1.87		4790.00	4832.70		
527 > 81	65	3.758	3.758		94193	19	>100:1	1.98 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.372	4.370	1/0	332917	19		Target = 3.27		4820.00	4764.90		M
627 > 80	65	4.372	4.370		100738	17	>100:1	3.30 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.765	3.758	1	608241	20	>100:1			1000.00	1031.17	103	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.765	3.758	1/0	3094369	20	>100:1	Target = 13.00		5000.00	4773.25		
513 > 169	51	3.773	3.758		235442	19	>100:1	13.14 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.926	3.917	1	633865	19	>100:1			5000.00	4748.61	105.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.926	3.926	1/0	508348	35		Target = 1.39	0.06	5000.00	5131.87		M
570 > 483	58	3.934	3.926		357516	33	>100:1	1.42 (0.69-2.09)	0.17				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.086	4.076	1	633568	17	>100:1			1000.00	964.52	89.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.086	4.085	1/0	2786976	16	>100:1	Target = 13.51		5000.00	4973.08		
563 > 169	52	4.095	4.085		205859	15	>100:1	13.53 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.095	4.085	1	567342	16	>100:1			5000.00	4936.40	108.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.095	4.093	1/0	569109	34	>100:1	Target = 1.80		5000.00	5055.06		M
584 > 526	60	4.095	4.093		376779	32	>100:1	1.51 (0.90-2.70)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.157	4.147	1	78650	16	>100:1			1000.00	1047.02	115.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.166	4.156	1/0	431866	15	>100:1			5000.00	4803.67		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.175	4.164	1	47865	16	8.8:1			1000.00	972.91	117.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.175	4.173	1/0	246128	15	>100:1	Target = 1.02		5000.00	5225.35		
512 > 219	57	4.175	4.173		246970	16	>100:1	0.99 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.314	4.313	1	80784	15	>100:1			1000.00	1032.00	118	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.335	4.323	1/0	430906	15	>100:1			5000.00	4476.81		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.335	4.333	1	44932	13	>100:1			1000.00	1081.49	118.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.344	4.342	1/0	222960	13	>100:1	Target = 0.97		5000.00	4738.95		
526 > 219	59	4.344	4.342		232121	15	>100:1	0.96 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.363	4.352	1	782694	17	>100:1			1000.00	1054.24	105	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.363	4.352	1/0	3970694	16	>100:1	Target = 11.10		5000.00	5008.38		
613 > 169	38	4.363	4.352		370592	15	>100:1	10.71 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.591	4.590	1/0	2850833	18	>100:1	Target = 7.97		5000.00	4534.83		
663 > 169	38	4.591	4.590		362834	16	>100:1	7.85 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.792	4.786	1	880859	20	>100:1			1000.00	1006.67	104.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.792	4.786	1/0	3553725	20	>100:1	Target = 11.40		5000.00	5008.15		
713 > 169	42	4.792	4.786		312237	20	>100:1	11.38 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.145	5.139	1	861669	22	>100:1			1000.00	1029.37	112.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.145	5.145	1/0	2414543	21	>100:1	Target = 10.50		5000.00	4689.52		
813 > 269	40	5.145	5.145		230003	21	>100:1	10.49 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.507	5.507	1/0	3879673	23	>100:1	Target = 13.22		5000.00	4940.84		
913 > 319	40	5.507	5.507		292705	23	>100:1	13.25 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.765	3.758	1	624788	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.326	2.343	-1	598734	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.012	3.025	0	516445	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.756	1.743	1	494309	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.394	3.394	1	137216	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B024.d
Injection Date: 23-Jul-2021 00:32:08 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 8 Auto Sampler: 8
Sample Info: F.L. ICAL 10000_SVLC-1552 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.756	1.743	1	472283	20	>100:1			1000.00	856.52	83.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.756	1.749	1/0	4618423	19	>100:1			10000	10141		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.045	2.045	1	438943	16	>100:1			1000.00	850.11	83.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.045	2.045	1/0	4753112	14	>100:1			10000	10203		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.088	2.087	1	140086	13	>100:1			1000.00	807.10	82.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.088	2.087	1/0	1711209	14	>100:1	Target = 3.42		8840.00	9447.77		
298.9 > 99	44	2.088	2.087		499866	14	>100:1	3.42 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.362	2.361	1/0	1308560	17		Target = 2.97		9380.00	9994.05		
349 > 99	44	2.362	2.361		457356	16	>100:1	2.86 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.308	2.308	1	89997	17	>100:1			5000.00	4514.33	99.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.308	2.317	0/-1	321857	17		Target = 1.63		9340.00	8851.45		
327 > 81	63	2.308	2.317		162694	18	>100:1	1.97 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.335	2.343	0	499241	18	>100:1			1000.00	827.83	83.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.335	2.343	0/0	5320058	18	>100:1	Target = 18.20		10000	10425		
313 > 119	49	2.335	2.343		298436	17	>100:1	17.82 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.433	2.441	0	951477	17	>100:1			5000.00	4467.64	95.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.433	2.441	0/0	2465817	17	>100:1	Target = 0.78		20000	18819		
285 > 185	66	2.433	2.441		3232939	17	>100:1	0.76 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.663	2.672	0	424879	18	>100:1			1000.00	876.07	88	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.663	2.672	0/0	4590070	18	>100:1	Target = 3.72		10000	9633.53		
363 > 169	47	2.663	2.672		1224789	18	>100:1	3.74 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.672	2.681	0	109122	18	>100:1			1000.00	785.72	79.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.672	2.681	0/0	1141998	26	>100:1	Target = 3.04	0.18	9100.00	9772.90		
399 > 99	45	2.672	2.681		360946	23	>100:1	3.16 (1.52-4.56)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.700	2.708	0/0	6693818	18	>100:1	Target = 3.02		9420.00	9832.58		
377 > 85	45	2.700	2.708		2232580	18	>100:1	2.99 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.041	3.032	1/1	1076256	22	>100:1	Target = 3.10		9520.00	10056		
449 > 99	45	3.041	3.032		362342	22	>100:1	2.97 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.012	3.005	1	65849	23	>100:1			5000.00	4198.81	85.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.012	3.005	1/0	332130	22		Target = 1.81		9480.00	8941.53		
427 > 81	64	3.012	3.005		175908	22	>100:1	1.88 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.034	3.025	1	399015	22	>100:1			1000.00	806.48	74	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.041	3.025	1/0	3834519	21	>100:1	Target = 2.85		10000	10122		
413 > 169	53	3.041	3.025		1343670	21	>100:1	2.85 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.418	3.394	2	111576	20	>100:1			1000.00	801.12	79.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.426	3.394	2/0	1249233	43	>100:1	Target = 3.31	0.27	9280.00	10219		M
499 > 99	54	3.426	3.394		379749	42	>100:1	3.28 (1.65-4.96)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.639	3.606	2/0	4224322	20	>100:1			9320.00	10499		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.775	3.744	2/0	948237	19	>100:1	Target = 2.73		9600.00	10668		
549 > 99	54	3.775	3.744		345820	18	>100:1	2.74 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.080	4.058	2/0	939294	16	>100:1	Target = 2.65		9640.00	11072		
599 > 99	54	4.080	4.058		340967	16	>100:1	2.75 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.237	4.221	1/-1	3789526	15	>100:1			9420.00	10553		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.569	4.565	1/-1	995597	16	>100:1	Target = 3.07		9680.00	10652		
699 > 99	54	4.569	4.565		323518	16	>100:1	3.07 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.433	3.401	2	525981	19	>100:1			1000.00	863.41	85	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.433	3.401	2/0	5365192	21	>100:1	Target = 6.36		10000	9681.98		
463 > 169	56	3.426	3.401		864521	21	>100:1	6.20 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.740	3.710	2	228568	21	>100:1			1000.00	856.13	91.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.733	3.710	2/0	2487137	20	>100:1	Target = 37.21		10000	10186		
498>478	55	3.740	3.710		76465	19	>100:1	32.52 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.782	3.751	2	76412	17	>100:1			5000.00	4514.45	105.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.782	3.758	2/0	302480	20	>100:1	Target = 1.87		9580.00	8614.42		
527 > 81	65	3.782	3.758		162802	19	>100:1	1.85 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.383	4.370	1/-1	543874	23		Target = 3.27		9640.00	8593.00		M
627 > 80	65	4.383	4.370		156334	17		3.47 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.782	3.758	2	490557	19	>100:1			1000.00	831.66	83.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.790	3.758	2/0	5385157	19	>100:1	Target = 13.00		10000	10300		
513 > 169	51	3.782	3.758		416484	18	>100:1	12.93 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.945	3.917	2	614018	18	>100:1			5000.00	4599.92	102	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.945	3.926	2/0	913087	34	>100:1	Target = 1.39	0.08	10000	9515.74		M
570 > 483	58	3.954	3.926		664115	34	>100:1	1.37 (0.69-2.09)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.098	4.076	2	526954	16	>100:1			1000.00	802.21	74.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.107	4.085	2/0	4904060	16	>100:1	Target = 13.51		10000	10521		
563 > 169	52	4.098	4.085		354128	17	>100:1	13.84 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.107	4.085	2	469498	17	>100:1			5000.00	4085.07	90.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.116	4.093	2/0	952128	31	>100:1	Target = 1.80		10000	10220		M
584 > 526	60	4.116	4.093		558663	31	>100:1	1.70 (0.90-2.70)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.169	4.147	2	69224	15	>100:1			1000.00	921.54	101.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.178	4.156	2/0	767594	16	>100:1			10000	9700.58		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.187	4.164	2	48389	16	5.9:1			1000.00	983.56	118.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.187	4.173	1/-1	465622	14	>100:1	Target = 1.02		10000	9778.21		
512 > 219	57	4.187	4.173		416167	14	>100:1	1.11 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.328	4.313	1	71557	13	>100:1			1000.00	914.13	104.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.338	4.323	1/0	784695	14	>100:1			10000	9203.64		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.347	4.333	1	38039	12	>100:1			1000.00	915.58	100	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.357	4.342	1/0	396749	14	>100:1	Target = 0.97		10000	9984.60		
526 > 219	59	4.357	4.342		418353	15	>100:1	0.94 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.375	4.352	2	624240	18	>100:1			1000.00	840.81	83.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.375	4.352	2/0	5937306	17	>100:1	Target = 11.10		10000	9389.89		
613 > 169	38	4.366	4.352		582467	15	>100:1	10.19 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.594	4.590	1/-1	5132753	16	>100:1	Target = 7.97		10000	10237		
663 > 169	38	4.594	4.590		635118	15	>100:1	8.08 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.794	4.786	1	766250	19	>100:1			1000.00	875.69	90.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.794	4.786	1/0	6098540	20	>100:1	Target = 11.40		10000	9879.97		
713 > 169	42	4.794	4.786		519103	20	>100:1	11.74 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.146	5.139	1	732913	22	>100:1			1000.00	875.56	95.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.146	5.145	1/0	4188135	21	>100:1	Target = 10.50		10000	9563.17		
813 > 269	40	5.146	5.145		402834	21	>100:1	10.39 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.502	5.507	0/-1	6750830	23	>100:1	Target = 13.22		10000	10108		
913 > 319	40	5.502	5.507		517071	23	>100:1	13.05 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.790	3.758	2	525891	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.335	2.343	0	516865	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.034	3.025	1	442186	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.756	1.743	1	440120	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.418	3.394	2	109022	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B025.d
Injection Date: 23-Jul-2021 00:42:44 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 9 Auto Sampler: 9
Sample Info: F.L. ICAL 15000_SVLC-1553 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.750	1.743	1	515476	20	>100:1			1000.00	934.86	91.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.756	1.749	1/0	7437630	19	>100:1			15000	14963		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.045	2.045	1	481475	15	>100:1			1000.00	932.48	92	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.045	2.045	1/0	7636713	15	>100:1			15000	14945		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.088	2.087	1	163595	14	>100:1			1000.00	942.55	96.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.088	2.087	1/0	2848967	14	>100:1	Target = 3.42		13260	13469		
298.9 > 99	44	2.088	2.087		825041	14	>100:1	3.45 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.362	2.361	1/0	2061129	17	>100:1	Target = 2.97		14070	13480		
349 > 99	44	2.362	2.361		701618	18	>100:1	2.93 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.308	2.308	1	92997	17	>100:1			5000.00	4664.81	103.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.308	2.317	0/-1	519802	18	>100:1	Target = 1.63		14010	13834		
327 > 81	63	2.308	2.317		276614	17	>100:1	1.87 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.335	2.343	0	541057	18	>100:1			1000.00	897.17	90.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.335	2.343	0/0	8651109	18	>100:1	Target = 18.20		15000	15642		
313 > 119	49	2.335	2.343		465428	17	>100:1	18.58 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.433	2.441	0	1030944	17	>100:1			5000.00	4840.77	103	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.433	2.441	0/0	4208040	17	>100:1	Target = 0.78		30000	29639		
285 > 185	66	2.433	2.441		5249377	17	>100:1	0.80 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.672	2.672	1	433987	18	>100:1			1000.00	894.85	89.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.672	2.672	1/0	7410037	19	>100:1	Target = 3.72		15000	15226		
363 > 169	47	2.672	2.672		2008679	19	>100:1	3.68 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.681	2.681	1	121799	19	>100:1			1000.00	877.00	88.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.681	2.681	1/0	1867043	27	>100:1	Target = 3.04	0.20	13650	14315		
399 > 99	45	2.681	2.681		624919	24	>100:1	2.98 (1.52-4.56)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.709	2.708	1/0	11436842	19	>100:1	Target = 3.02		14130	15051		
377 > 85	45	2.709	2.708		3743830	18	>100:1	3.05 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.054	3.032	2/1	1726431	22	>100:1	Target = 3.10		14280	14452		
449 > 99	45	3.054	3.032		556029	22	>100:1	3.10 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.027	3.005	2	73618	21	>100:1			5000.00	4694.20	95.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.027	3.005	2/0	531520	21	>100:1	Target = 1.81		14220	12799		
427 > 81	64	3.027	3.005		281382	21		1.88 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.047	3.025	2	424537	22	>100:1			1000.00	858.06	78.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.047	3.025	2/0	6508653	21	>100:1	Target = 2.85		15000	16148		
413 > 169	53	3.047	3.025		2140726	21	>100:1	3.04 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.433	3.394	3	131902	19				1000.00	947.06	94.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.433	3.394	3/0	2026119	44	>100:1	Target = 3.31		13920	14026		M
499 > 99	54	3.433	3.394		616150	42	>100:1	3.28 (1.65-4.96)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.651	3.606	3/0	7051525	21	>100:1			13980	14826		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.790	3.744	3/0	1519794	19	>100:1	Target = 2.73		14400	14464		
549 > 99	54	3.790	3.744		541678	19	>100:1	2.80 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.089	4.058	2/-1	1521234	16	>100:1	Target = 2.65		14460	15171		
599 > 99	54	4.089	4.058		575719	16	>100:1	2.64 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.247	4.221	2/-1	5926895	14	>100:1			14130	13962		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.577	4.565	1/-2	1683536	16	>100:1	Target = 3.07		14520	15237		
699 > 99	54	4.577	4.565		537158	16		3.13 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.440	3.401	3	549315	21	>100:1			1000.00	901.71	88.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.448	3.401	3/0	8703707	21	>100:1	Target = 6.36		15000	15039		
463 > 169	56	3.440	3.401		1345542	21	>100:1	6.46 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.746	3.710	3	249606	19	>100:1			1000.00	934.93	99.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.753	3.710	3/0	4086381	19	>100:1	Target = 37.21		15000	15325		
498>478	55	3.753	3.710		132217	21		30.90 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.798	3.751	3	83016	19	>100:1			5000.00	4904.61	115	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.798	3.758	3/0	485646	20	>100:1	Target = 1.87		14370	12731		
527 > 81	65	3.790	3.758		262684	19	>100:1	1.84 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.390	4.370	2/-1	870137	22	>100:1	Target = 3.27		14460	12654		M
627 > 80	65	4.390	4.370		250961	16	>100:1	3.46 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.798	3.758	3	531780	18	>100:1			1000.00	901.54	90.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.806	3.758	3/0	8039433	20	>100:1	Target = 13.00		15000	14184		
513 > 169	51	3.798	3.758		639745	19	>100:1	12.56 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.954	3.917	3	738160	17	>100:1			5000.00	5529.93	122.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.963	3.926	3/0	1599797	33	>100:1	Target = 1.39	0.09	15000	13868		M
570 > 483	58	3.963	3.926		1167513	33	>100:1	1.37 (0.69-2.09)	0.10				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.106	4.076	2	561767	16				1000.00	855.21	79.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.115	4.085	2/0	7790693	16	>100:1	Target = 13.51		15000	15679		
563 > 169	52	4.115	4.085		543777	16	>100:1	14.32 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.115	4.085	2	525972	17	>100:1			5000.00	4576.45	100.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.115	4.093	2/0	1536307	31	>100:1	Target = 1.80		15000	14719		M
584 > 526	60	4.124	4.093		980422	31	>100:1	1.56 (0.90-2.70)	0.29				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.169	4.147	2	75256	15	>100:1			1000.00	1001.84	110.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.186	4.156	2/0	1230014	15	>100:1			15000	14299		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.196	4.164	2	57210	17	4.6:1			1000.00	1162.86	140.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.196	4.173	2/0	760759	14	>100:1	Target = 1.02		15000	13513		
512 > 219	57	4.196	4.173		756165	14	>100:1	1.00 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.338	4.313	2	74663	13	>100:1			1000.00	953.81	109.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.347	4.323	2/0	1294585	14	>100:1			15000	14552		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.357	4.333	2	38864	15	>100:1			1000.00	935.44	102.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.357	4.342	1/-1	677399	14	>100:1	Target = 0.97		15000	16700		
526 > 219	59	4.357	4.342		642877	14	>100:1	1.05 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.375	4.352	2	709060	18	>100:1			1000.00	955.06	95.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.375	4.352	2/0	9865365	17	>100:1	Target = 11.10		15000	13736		
613 > 169	38	4.375	4.352		962507	17	>100:1	10.24 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.602	4.590	1/-1	8405331	17	>100:1	Target = 7.97		15000	14759		
663 > 169	38	4.602	4.590		1032173	17	>100:1	8.14 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.800	4.786	1	852681	20	>100:1			1000.00	974.47	100.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.800	4.786	1/0	10079344	19	>100:1	Target = 11.40		15000	14674		
713 > 169	42	4.800	4.786		902663	19	>100:1	11.16 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.152	5.139	1	851921	22	>100:1			1000.00	1017.73	110.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.152	5.145	1/0	6946632	22	>100:1	Target = 10.50		15000	13646		
813 > 269	40	5.152	5.145		675683	22	>100:1	10.28 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.517	5.507	1/0	11215472	24	>100:1	Target = 13.22		15000	14447		
913 > 319	40	5.517	5.507		868655	24	>100:1	12.91 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.798	3.758	3	605736	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.335	2.343	0	562139	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.047	3.025	2	454391	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.750	1.743	1	466568	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.433	3.394	3	123534	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B026.d
Injection Date: 23-Jul-2021 00:53:22 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 10 Auto Sampler: 10
Sample Info: F.L. ICAL 20000_SVLC-1554 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.749	1.743	1	532517	19	>100:1			1000.00	965.76	94.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.756	1.749	1/0	10063548	19	>100:1			20000	19598		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.045	1	494900	15	>100:1			1000.00	958.48	94.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.055	2.045	1/0	10089689	14	>100:1			20000	19210		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.087	2.087	1	172404	14	>100:1			1000.00	993.30	101.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.087	2.087	1/0	3892346	14	>100:1	Target = 3.42		17680	17462		
298.9 > 99	44	2.087	2.087		1142648	14	>100:1	3.40 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.370	2.361	1/0	3019383	17	>100:1	Target = 2.97		18760	18738		
349 > 99	44	2.361	2.361		988518	18	>100:1	3.05 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.317	2.308	1	98755	17	>100:1			5000.00	4953.64	109.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.308	2.317	0/-1	758441	17		Target = 1.63		18680	19008		
327 > 81	63	2.317	2.317		383874	17	>100:1	1.97 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.344	2.343	1	589408	17	>100:1			1000.00	977.35	98.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.344	2.343	1/0	11056552	18	>100:1	Target = 18.20		20000	18351		
313 > 119	49	2.344	2.343		651607	18	>100:1	16.96 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.442	2.441	1	989899	18	>100:1			5000.00	4648.05	98.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.442	2.441	1/0	5617453	17	>100:1	Target = 0.78		40000	41207		
285 > 185	66	2.442	2.441		7011684	17	>100:1	0.80 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.672	2.672	1	455783	17	>100:1			1000.00	939.79	94.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.681	2.672	1/0	10153232	18	>100:1	Target = 3.72		20000	19864		
363 > 169	47	2.672	2.672		2808257	18	>100:1	3.61 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.690	2.681	1	129872	18	>100:1			1000.00	935.13	94.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.690	2.681	1/0	2578419	26	>100:1	Target = 3.04	0.20	18200	18540		
399 > 99	45	2.681	2.681		845059	25	>100:1	3.05 (1.52-4.56)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.708	2.708	1/0	15069894	17	>100:1	Target = 3.02		18840	18599		
377 > 85	45	2.708	2.708		5218878	18	>100:1	2.88 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.059	3.032	2/1	2337970	23	>100:1	Target = 3.10		19040	18355		
449 > 99	45	3.059	3.032		790538	22	>100:1	2.95 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.032	3.005	2	72574	24	>100:1			5000.00	4627.63	93.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.032	3.005	2/0	669113	23	>100:1	Target = 1.81		18960	16344		
427 > 81	64	3.025	3.005		372921	23	>100:1	1.79 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.052	3.025	2	452495	22	>100:1			1000.00	914.57	84	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.052	3.025	2/0	8363090	22	>100:1	Target = 2.85		20000	19466		
413 > 169	53	3.052	3.025		2903358	22	>100:1	2.88 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.438	3.394	3	139484	18	>100:1			1000.00	1001.50	99.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.438	3.394	3/0	2937984	44	>100:1	Target = 3.31	0.28	18560	19240		M
499 > 99	54	3.438	3.394		871045	42	>100:1	3.37 (1.65-4.96)	0.06				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.649	3.606	3/0	9678417	21	>100:1			18640	19242		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.787	3.744	3/0	2092634	19	>100:1	Target = 2.73		19200	18833		
549 > 99	54	3.787	3.744		759053	20	>100:1	2.75 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.102	4.058	3/0	2079420	16	>100:1	Target = 2.65		19280	19612		
599 > 99	54	4.093	4.058		799082	16	>100:1	2.60 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.252	4.221	2/-1	8428925	14	>100:1			18840	18777		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.582	4.565	2/-1	2352565	16	>100:1	Target = 3.07		19360	20135		
699 > 99	54	4.582	4.565		729812	16	>100:1	3.22 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.446	3.401	3	585461	20	>100:1			1000.00	961.05	94.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.446	3.401	3/0	12036723	20	>100:1	Target = 6.36		20000	19515		
463 > 169	56	3.446	3.401		2000130	20	>100:1	6.01 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.751	3.710	3	259213	20	>100:1			1000.00	970.91	103.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.751	3.710	3/0	5865187	20	>100:1	Target = 37.21		20000	21180		
498>478	55	3.751	3.710		191780	19	>100:1	30.58 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.795	3.751	3	76382	24				5000.00	4512.68	105.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.795	3.758	3/0	648111	20	>100:1	Target = 1.87		19160	18465		
527 > 81	65	3.795	3.758		322251	20	>100:1	2.01 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.394	4.370	2/-1	1160751	23		Target = 3.27		19280	18347		M
627 > 80	65	4.394	4.370		330429	17		3.51 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.803	3.758	3	554629	18	>100:1			1000.00	940.28	93.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.803	3.758	3/0	11323896	18	>100:1	Target = 13.00		20000	19156		
513 > 169	51	3.803	3.758		889950	20	>100:1	12.72 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.960	3.917	3	702845	18	>100:1			5000.00	5265.37	116.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.960	3.926	3/0	2205543	33	>100:1	Target = 1.39	0.07	20000	20080		M
570 > 483	58	3.960	3.926		1606026	32	>100:1	1.37 (0.69-2.09)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.120	4.076	3	616790	17	>100:1			1000.00	938.97	87.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.120	4.085	3/0	10634436	17	>100:1	Target = 13.51		20000	19492		
563 > 169	52	4.120	4.085		765113	16	>100:1	13.89 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.120	4.085	3	533502	17	>100:1			5000.00	4641.96	102.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.129	4.093	3/0	2170015	32	>100:1	Target = 1.80		20000	20498		M
584 > 526	60	4.129	4.093		1267905	32	>100:1	1.71 (0.90-2.70)	0.30				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.182	4.147	3	78092	15	>100:1			1000.00	1039.59	114.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.192	4.156	3/0	1817891	15	>100:1			20000	20365		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.201	4.164	3	53618	20	3.9:1			1000.00	1089.85	131.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.201	4.173	2/-1	1053502	13	>100:1	Target = 1.02		20000	19966		
512 > 219	57	4.201	4.173		1025111	14	>100:1	1.02 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.342	4.313	2	80774	15	>100:1			1000.00	1031.87	118	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.352	4.323	2/0	1887024	14	>100:1			20000	19607		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.361	4.333	2	44710	18	>100:1			1000.00	1076.15	117.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.370	4.342	2/0	902643	14	>100:1	Target = 0.97		20000	19347		
526 > 219	59	4.370	4.342		907444	18	>100:1	0.99 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.386	4.352	3	683408	16	>100:1			1000.00	920.51	91.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.386	4.352	3/0	13386339	16	>100:1	Target = 11.10		20000	19338		
613 > 169	38	4.386	4.352		1273565	17	>100:1	10.51 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.607	4.590	2/-1	10825266	17	>100:1	Target = 7.97		20000	19721		
663 > 169	38	4.607	4.590		1421392	17	>100:1	7.61 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.803	4.786	2	960299	20	>100:1			1000.00	1097.45	113.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.803	4.786	2/0	13914583	20	>100:1	Target = 11.40		20000	17987		
713 > 169	42	4.803	4.786		1276621	20	>100:1	10.89 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.156	5.139	2	870576	22	>100:1			1000.00	1040.01	113.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.156	5.145	1/-1	9474720	21	>100:1	Target = 10.50		20000	18213		
813 > 269	40	5.156	5.145		913668	21	>100:1	10.36 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.514	5.507	1/-1	14954365	23	>100:1	Target = 13.22		20000	18850		
913 > 319	40	5.514	5.507		1181474	23	>100:1	12.65 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.803	3.758	3	631298	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.344	2.343	1	590710	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.052	3.025	2	469502	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.756	1.743	1	479357	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.438	3.394	3	136345	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B027.d		
Injection Date:	23-Jul-2021 01:04:03	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	11
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.749	1.743	1	530021	20	>100:1			1001.00	961.24	94.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.755	1.749	1/0	4204	18	1.8:1			8.2338	8.2338		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.045	1	489121	15	>100:1			1001.00	947.29	93.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.045		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.087	2.087	0	157927	14	>100:1			1001.00	909.89	93.3	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.087		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.361		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.317	2.308	1	97764	17	>100:1			5005.00	4903.93	108.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.317		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.353	2.343	1	593202	17	>100:1			1001.00	983.64	98.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.343		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.451	2.441	1	1043822	16	>100:1			5005.00	4901.24	104.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.441		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.681	2.672	1	438397	18	>100:1			1001.00	903.94	90.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.672		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.690	2.681	1	127618	19	>100:1			1001.00	918.90	92.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.681		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.708		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.032		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.032	3.005	2	78699	23	>100:1			5005.00	5018.19	101.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.005		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.059	3.025	3	444689	22	>100:1			1001.00	898.79	82.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.025		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.446	3.394	4	127391	19	>100:1			1001.00	914.67	91	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.394		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.606		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.744		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.058		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.242	4.221	2/-2	813	14	9.8:1			1.9850	1.9850		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.582	4.565	2/-2	303	13	4.4:1	Target = 3.09		2.8423	2.8423		
699 > 99	54	4.598	4.565		122	15		2.48 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.446	3.401	3	573095	20	>100:1			1001.00	940.75	92.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.401		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.758	3.710	3	277276	21	>100:1			1001.00	1038.57	110.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.710		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.795	3.751	3	88050	19				5005.00	5202.03	122	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.758		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.370		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.803	3.758	3	584690	20	>100:1			1001.00	991.24	99	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.758		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.960	3.917	3	695689	18	>100:1			5005.00	5211.76	115.6	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		3.926		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.120	4.076	3	604878	17	>100:1			1001.00	920.84	85.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.085		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.120	4.085	3	611741	16	>100:1			5005.00	5322.72	117.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.120	4.093	2/-1	1267	17	5.3:1	Target = 1.44		10.448	10.448		
584 > 526	60	4.111	4.093		819	12	7.5:1	1.54 (0.72-2.17)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.182	4.147	3	77348	16	>100:1			1001.00	1029.69	113.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.156		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.202	4.164	3	43754	14	>100:1			1001.00	889.35	107.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.192	4.173	2/-1	845	11	4.4:1	Target = 1.01		19.645	19.645		
512 > 219	57	4.192	4.173		1209	12		0.69 (0.50-1.51)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.342	4.313	2	75000	16	>100:1			1001.00	958.11	109.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.323		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.361	4.333	2	41417	14	>100:1			1001.00	996.89	108.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.342		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.378	4.352	2	713253	15				1001.00	960.71	95.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.386	4.352	3/1	4866	19	1.0:1	Target = 10.01		6.7419	6.7419		
613 > 169	38	4.378	4.352		479	9	4.4:1	10.15 (5.00-15.02)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.607	4.590	2/0	3985	12	8.0:1	Target = 8.02		6.9631	6.9631		
663 > 169	38	4.615	4.590		585	11	3.9:1	6.81 (4.01-12.04)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.803	4.786	2	856784	20	>100:1			1001.00	979.15	101.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.809	4.786	2/0	7167	18	6.8:1	Target = 11.30		10.394	10.394		
713 > 169	42	4.803	4.786		620	13	6.6:1	11.55 (5.65-16.95)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.156	5.139	2	858626	22	>100:1			1001.00	1025.74	111.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.156	5.145	1/-1	14095	18	14:1	Target = 10.45		27.500	27.500		
813 > 269	40	5.150	5.145		1593	28	12:1	8.84 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.521	5.507	1/-1	27679	24	17:1	Target = 13.35		35.410	35.410		
913 > 319	40	5.521	5.507		2620	29	12:1	10.56 (6.67-20.02)					
*** 37 13C2_PFDA**													
515 > 470		3.803	3.758	3	711817	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.353	2.343	1	603190	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.059	3.025	3	554234	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.749	1.743	1	556974	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.446	3.394	4	141001	20							

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B028.d
Injection Date: 23-Jul-2021 01:14:35 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC- 1577 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	697063			123.8	50 - 150
8 PFBA			500.00	412.81	82.6	70 - 130
D 50 13C5_PFPeA	523546	646174			123.4	50 - 150
21 PFPeA			500.00	413.60	82.7	70 - 130
7 PFBS			442.50	374.28	84.6	70 - 130
D 44 13C3_PFBS	169277	219583			129.7	50 - 150
D 63 13C2_4:2 FTS_2	90196	109973			121.9	50 - 150
1 4:2 FTS			467.50	512.75	109.7	70 - 130
D 49 13C5_PFHxA	600114	753591			125.6	50 - 150
15 PFHxA			500.00	402.35	80.5	70 - 130
22 PFPeS			470.00	393.01	83.6	70 - 130
28 GenX			2500.00	2196.01	87.8	70 - 130
D 66 13C3_GenX	1000599	1205811			120.5	50 - 150
D 47 13C4_PFHpA	482787	629323			130.4	50 - 150
13 PFHpA			500.00	403.53	80.7	70 - 130
D 45 13C3_PFHxS	137682	162385			117.9	50 - 150
14 PFHxS			456.00	378.36	83	70 - 130
29 ADONA			2355.00	2154.64	91.5	70 - 130
D 64 13C2_6:2 FTS_2	77321	92003			119	50 - 150
2 6:2 FTS			475.00	376.51	79.3	70 - 130
20 PFOA			500.00	424.92	85	70 - 130
D 53 13C8_PFOA	538966	589571			109.4	50 - 150
12 PFHpS			475.00	416.18	87.6	70 - 130
18 PFOS			462.75	397.81	86	70 - 130
D 54 13C8_PFOS	139992	170702			121.9	50 - 150
17 PFNA			500.00	381.86	76.4	70 - 130
D 56 13C9_PFNA	618881	769275			124.3	50 - 150
30 9Cl-PF3ONS			2330.00	1889.62	81.1	70 - 130
D 55 13C8_PFOSA	250019	323061			129.2	50 - 150
19 PFOSA			500.00	433.98	86.8	70 - 130
16 PFNS			480.00	405.71	84.5	70 - 130
D 65 13C2_8:2 FTS_2	72182	102430			141.9	50 - 150
10 PFDA			500.00	440.32	88.1	70 - 130
3 8:2 FTS			480.00	469.71	97.9	70 - 130
D 51 13C6_PFDA	590501	740625			125.4	50 - 150
D 58 d3-MeFOSAA	601725	791178			131.5	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	534.50	106.9	70 - 130
9 PFDS			482.50	416.99	86.4	70 - 130
D 52 13C7_PFUdA	707587	862142			121.8	50 - 150
25 PFUdA			500.00	410.40	82.1	70 - 130
D 60 d5-EtFOSAA	521292	662875			127.2	50 - 150
5 N-EtFOSAA			500.00	547.14	109.4	70 - 130
D 61 d7-MeFOSE	68295	98617			144.4	50 - 150
D 57 d3-MeFOSA	40777	55738			136.7	50 - 150
31 11Cl-PF3OUDS			2355.00	1917.40	81.4	70 - 130
D 62 d9-EtFOSE	68452	89797			131.2	50 - 150
D 59 d5-EtFOSA	38025	50890			133.8	50 - 150
11 PFDoA			500.00	395.66	79.1	70 - 130
D 38 13C2_PFDoA	745164	941425			126.3	50 - 150
4 10:2 FTS			2410.00	2228.22	92.5	70 - 130
24 PFTrDA			500.00	449.20	89.8	70 - 130
23 PFTeDA			500.00	437.70	87.5	70 - 130
D 42 13C2_PFTeDA	846373	1087648			128.5	50 - 150
D 40 13C2_PFHxDA	768834	934133			121.5	50 - 150

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B028.d
Injection Date: 23-Jul-2021 01:14:35 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC- 1577 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.750	1.743	1	697063	20	>100:1			1000.00	1264.18	123.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.756	1.749	1/0	277477	19	>100:1			500.00	412.81		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.056	2.045	1	646174	15	>100:1			1000.00	1251.46	123.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.056	2.045	1/0	283633	15	>100:1			500.00	413.60		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.088	2.087	1	219583	15	>100:1			1000.00	1265.13	129.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.088	2.087	1/0	106262	14	>100:1	Target = 3.42		442.50	374.28		
298.9 > 99	44	2.088	2.087		30384	16	>100:1	3.49 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.371	2.361	1/0	80660	16		Target = 2.97		470.00	393.01		
349 > 99	44	2.362	2.361		26477	19	>100:1	3.04 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.309	2.308	1	109973	17	>100:1			5000.00	5516.34	121.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.318	2.317	1/0	22783	22	>100:1	Target = 1.63		467.50	512.75		
327 > 81	63	2.309	2.317		10870	16	67:1	2.09 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.344	2.343	1	753591	16	>100:1			1000.00	1249.59	125.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.344	2.343	1/0	309943	17	>100:1	Target = 18.20		500.00	402.35		
313 > 119	49	2.344	2.343		17627	16	>100:1	17.58 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.443	2.441	1	1205811	17	>100:1			5000.00	5661.86	120.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.443	2.441	1/0	364662	18	>100:1	Target = 0.78		2500.00	2196.01		
285 > 185	66	2.443	2.441		468868	17	>100:1	0.77 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.673	2.672	1	629323	18	>100:1			1000.00	1297.61	130.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.682	2.672	1/0	284785	18	>100:1	Target = 3.72		500.00	403.53		
363 > 169	47	2.673	2.672		74886	16	>100:1	3.80 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.682	2.681	1	162385	19	>100:1			1000.00	1169.23	117.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.691	2.681	1/0	65793	22	>100:1	Target = 3.04	0.18	456.00	378.36		M
399 > 99	45	2.691	2.681		22879	23	>100:1	2.87 (1.52-4.56)	0.07				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.709	2.708	1/0	2182807	18	>100:1	Target = 3.02		2355.00	2154.64		
377 > 85	45	2.709	2.708		690645	17	>100:1	3.16 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.055	3.032	2/1	66282	28	>100:1	Target = 3.10		475.00	416.18		
449 > 99	45	3.048	3.032		23049	20	>100:1	2.87 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.020	3.005	1	92003	21				5000.00	5866.51	119	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.028	3.005	2/1	19540	20	>100:1	Target = 1.81		475.00	376.51		
427 > 81	64	3.035	3.005		11473	19	60:1	1.70 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.055	3.025	2	589571	21	>100:1			1000.00	1191.62	109.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.055	3.025	2/0	237855	22	>100:1	Target = 2.85		500.00	424.92		
413 > 169	53	3.055	3.025		88645	21	>100:1	2.68 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.433	3.394	3	170702	20	>100:1			1000.00	1225.64	121.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.433	3.394	3/0	77557	42	>100:1	Target = 3.31		462.75	397.81		M
499 > 99	54	3.426	3.394		21203	40	>100:1	3.65 (1.65-4.96)	0.10				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.646	3.606	3/0	1163149	22	>100:1			2330.00	1889.62		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.783	3.744	3/0	55170	18	>100:1	Target = 2.73		480.00	405.71		
549 > 99	54	3.791	3.744		21676	16	87:1	2.54 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.087	4.058	2/-1	55016	22	>100:1	Target = 2.65		482.50	416.99		
599 > 99	54	4.096	4.058		22226	14	>100:1	2.47 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.245	4.221	2/-1	1053356	15	>100:1			2355.00	1917.40		
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.441	3.401	3	769275	20	>100:1			1000.00	1262.78	124.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.441	3.401	3/0	309480	22	>100:1	Target = 6.36		500.00	381.86		
463 > 169	56	3.441	3.401		52815	19	>100:1	5.85 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.747	3.710	3	323061	19	>100:1			1000.00	1210.06	129.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.747	3.710	3/0	149779	19	>100:1	Target = 37.21		500.00	433.98		
498>478	55	3.747	3.710		3654	24	18:1	40.99 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.791	3.751	3	102430	19	>100:1			5000.00	6051.60	141.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.791	3.758	2/-1	22109	16	>100:1	Target = 1.87		480.00	469.71		
527 > 81	65	3.791	3.758		10005	20		2.20 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.389	4.370	2/-1	189050	16		Target = 3.27		2410.00	2228.22		
627 > 80	65	4.389	4.370		53493	16	>100:1	3.53 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.791	3.758	2	740625	19	>100:1			1000.00	1255.60	125.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.799	3.758	3/1	347573	16	>100:1	Target = 13.00		500.00	440.32		
513 > 169	51	3.799	3.758		29282	16	>100:1	11.86 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.953	3.917	3	791178	17	>100:1			5000.00	5927.12	131.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.962	3.926	3/0	66086	18	>100:1	Target = 1.39		500.00	534.50		
570 > 483	58	3.953	3.926		42009	16	>100:1	1.57 (0.69-2.09)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.105	4.076	2	862142	16	>100:1			1000.00	1312.49	121.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.114	4.085	2/0	312968	16	>100:1	Target = 13.51		500.00	410.40		
563 > 169	52	4.105	4.085		20317	21	>100:1	15.40 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.114	4.085	2	662875	16	>100:1			5000.00	5767.63	127.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.114	4.093	2/0	71971	17	>100:1	Target = 1.80		500.00	547.14		
584 > 526	60	4.114	4.093		39190	16	>100:1	1.83 (0.90-2.70)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.176	4.147	2	98617	15	>100:1			1000.00	1312.83	144.4	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.195	4.164	2	55738	14	3.2:1			1000.00	1132.94	136.7	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.336	4.313	2	89797	14	>100:1			1000.00	1147.14	131.2	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.355	4.333	2	50890	21	>100:1			1000.00	1224.90	133.8	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.374	4.352	2	941425	16				1000.00	1268.04	126.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.381	4.352	2/0	377303	16	>100:1	Target = 11.10		500.00	395.66		
613 > 169	38	4.374	4.352		33483	15	>100:1	11.26 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.601	4.590	1/-1	339658	17	>100:1	Target = 7.97		500.00	449.20		
663 > 169	38	4.601	4.590		40993	15	>100:1	8.28 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.799	4.786	1	1087648	19	>100:1			1000.00	1242.99	128.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.799	4.786	1/0	383496	18	>100:1	Target = 11.40		500.00	437.70		
713 > 169	42	4.799	4.786		32448	19	>100:1	11.81 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.152	5.139	1	934133	21	>100:1			1000.00	1115.94	121.5	
*** 37 13C2_PFDA**													
515 > 470		3.799	3.758	3	769123	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.344	2.343	1	645111	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.055	3.025	2	542296	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.750	1.743	1	554215	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.433	3.394	3	145980	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B029.d
Injection Date: 23-Jul-2021 01:25:08 Injection Vol: 10.0 uL
Sample Type: CheckStd Auto Sampler: 13
Sample Info: ISOMER CHECK STD_SVLC- 1562 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: IsomerCheck Conc. Level: Smp Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.756	1.743	1	647725	20	>100:1			1000.00	1174.70	115	
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.055	2.045	1	615004	16	>100:1			1000.00	1191.09	117.5	
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.098	2.087	1	210129	14	>100:1			1000.00	1210.66	124.1	
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.317	2.308	1	110850	18	>100:1			5000.00	5560.33	122.9	
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.352	2.343	1	686920	17	>100:1			1000.00	1139.04	114.5	
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.451	2.441	1	1360054	17	>100:1			5000.00	6386.10	135.9	
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.681	2.672	1	564166	17	>100:1			1000.00	1163.26	116.9	
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.690	2.681	1	161640	17	>100:1			1000.00	1163.87	117.4	
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.025	3.005	2	90167	21	>100:1			5000.00	5749.43	116.6	
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.045	3.025	2	557286	22	>100:1			1000.00	1126.37	103.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.045	3.025	2/0	6600689	35	>100:1	Target = 2.88		10000	12475		M
413 > 169	53	3.045	3.025		2459023	35	>100:1	2.68 (1.44-4.32)	0.23				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.425	3.394	2	168239	20	>100:1			1000.00	1207.96	120.2	
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.432	3.401	2	682881	20	>100:1			1000.00	1120.96	110.3	
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.731	3.710	2	305737	19	>100:1			1000.00	1145.17	122.3	
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.780	3.751	2	105945	20	>100:1			5000.00	6259.27	146.8	
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.780	3.758	2	734899	19	>100:1			1000.00	1245.89	124.5	
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		3.943	3.917	2	755411	19	>100:1			5000.00	5659.17	125.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	3.943	3.926	2/0	1801407	33	>100:1	Target = 1.45	0.08	10000	15259		M
570 > 483	58	3.943	3.926		1360399	33	>100:1	1.32 (0.72-2.17)	0.08				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.094	4.076	2	778206	16	>100:1			1000.00	1184.71	110	
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.094	4.085	1	727580	18	>100:1			5000.00	6330.62	139.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.112	4.093	2/1	1782748	35	>100:1	Target = 1.44	0.08	10000	12348		M
584 > 526	60	4.103	4.093		1186428	31	>100:1	1.50 (0.72-2.17)	0.09				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.165	4.147	2	87222	17	>100:1			1000.00	1161.13	127.7	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.183	4.164	2	58383	22	3.4:1			1000.00	1186.70	143.2	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.324	4.313	1	91826	15	>100:1			1000.00	1173.06	134.1	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.344	4.333	1	47917	15	>100:1			1000.00	1153.34	126	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.363	4.352	1	903973	15	>100:1			1000.00	1217.59	121.3	
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.786	4.786	1	1004753	20	>100:1			1000.00	1148.26	118.7	
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.139	5.139	1	988389	21	>100:1			1000.00	1180.76	128.6	
*** 37 13C2_PFDA**													
515 > 470		3.788	3.758	2	794034	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.352	2.343	1	664136	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.052	3.025	2	576398	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.756	1.743	1	596991	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.425	3.394	2	156191	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072521-DOD.b\072521005.d
Injection Date: 25-Jul-2021 12:22:57 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	110.22	110.2	70 - 130
D 46 13C4_PFBA	997866	895016			89.7	50 - 150
D 50 13C5_PFPeA	1059542	915140			86.4	50 - 150
21 PFPeA			100.00	104.59	104.6	70 - 130
D 44 13C3_PFBS	297147	285750			96.2	50 - 150
7 PFBS			88.400	85.476	96.7	70 - 130
1 4:2 FTS			93.400	88.825	95.1	70 - 130
D 63 13C2_4:2 FTS_2	210753	177921			84.4	50 - 150
D 49 13C5_PFHxA	864384	789993			91.4	50 - 150
15 PFHxA			100.00	108.26	108.3	70 - 130
22 PFPeS			93.800	97.355	103.8	70 - 130
28 GenX			200.00	177.96	89	70 - 130
D 66 13C3_GenX	649017	905272			139.5	50 - 150
D 47 13C4_PFHpA	1037869	850037			81.9	50 - 150
13 PFHpA			100.00	109.95	110	70 - 130
D 45 13C3_PFHxS	261903	251509			96	50 - 150
14 PFHxS			91.000	92.920	102.1	70 - 130
29 ADONA			94.200	103.15	109.5	70 - 130
D 64 13C2_6:2 FTS_2	179008	175345			98	50 - 150
2 6:2 FTS			94.800	122.79	129.5	70 - 130
20 PFOA			100.00	110.04	110	70 - 130
D 53 13C8_PFOA	991369	794632			80.2	50 - 150
12 PFHpS			95.200	98.583	103.6	70 - 130
18 PFOS			92.800	78.637	84.7	70 - 130
D 54 13C8_PFOS	227393	216951			95.4	50 - 150
17 PFNA			100.00	106.94	106.9	70 - 130
D 56 13C9_PFNA	954829	849072			88.9	50 - 150
30 9Cl-PF3ONS			93.200	97.740	104.9	70 - 130
D 55 13C8_PFOSA	391661	444832			113.6	50 - 150
19 PFOSA			100.00	111.08	111.1	70 - 130
16 PFNS			96.000	117.46	122.4	70 - 130
D 65 13C2_8:2 FTS_2	132148	169362			128.2	50 - 150
3 8:2 FTS			95.800	100.47	104.9	70 - 130
10 PFDA			100.00	100.24	100.2	70 - 130
D 51 13C6_PFDA	824029	751551			91.2	50 - 150
6 N-MeFOSAA			100.00	105.39	105.4	70 - 130

Report Date: 28-Jul-2021 06:40:16 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\ORGANICS\LL\LCMSMS01.i\072521-DOD.b\072521005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	862293	992885			115.1	50 - 150
9 PFDS			96.400	107.83	111.9	70 - 130
D 52 13C7_PFUdA	741490	742712			100.2	50 - 150
5 N-EtFOSAA			100.00	90.581	90.6	70 - 130
25 PFUdA			100.00	94.664	94.7	70 - 130
D 60 d5-EtFOSAA	830172	908700			109.5	50 - 150
D 61 d7-MeFOSE	145483	176961			121.6	50 - 150
32 MeFOSE			100.00	108.26	108.3	70 - 130
26 MeFOSA			100.00	132.34	132.3	70 - 130
D 57 d3-MeFOSA	60705	68029			112.1	50 - 150
31 11Cl-PF3OUDS			94.200	96.957	102.9	70 - 130
D 62 d9-EtFOSE	135458	178927			132.1	50 - 150
11 PFDoA			100.00	111.29	111.3	70 - 130
D 38 13C2_PFDoA	798101	749501			93.9	50 - 150
4 10:2 FTS			96.400	81.062	84.1	70 - 130
33 EtFOSE			100.00	96.816	96.8	70 - 130
D 59 d5-EtFOSA	51036	60082			117.7	50 - 150
27 EtFOSA			100.00	82.891	82.9	70 - 130
34 PFDOS			96.800	98.481	101.7	70 - 130
24 PFTrDA			100.00	110.52	110.5	70 - 130
23 PFTeDA			100.00	97.147	97.1	70 - 130
D 42 13C2_PFTeDA	864247	909223			105.2	50 - 150
35 PFHxDA			100.00	100.73	100.7	70 - 130
D 40 13C2_PFHxDA	383301	572782			149.4	50 - 150
36 PFODA			100.00	100.75	100.7	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072521-DOD.b\072521005.d
Injection Date: 25-Jul-2021 12:22:57 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.721	1.721	1	895016	19	>100:1			1000.00	964.63	89.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.727	1.727	2/1	100731	20	67:1			100.00	110.22		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.099	2.099	2	915140	15	>100:1			1000.00	948.15	86.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.099	2.099	2/0	95436	14	>100:1			100.00	104.59		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	2	285750	15	>100:1			1000.00	1004.66	96.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	2/0	33631	15	>100:1	Target = 3.65		88.400	85.476		
298.9 > 99	44	2.151	2.151		9997	17	65:1	3.36 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.511	2.511	3/1	28411	18	>100:1	Target = 3.30		93.800	97.355		
349 > 99	44	2.502	2.511		9181	17	82:1	3.09 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.433	2.433	3	177921	17	>100:1			5000.00	3875.37	84.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.441	2.441	0/-3	5573	16	51:1	Target = 1.50		93.400	88.825		M
327 > 81	63	2.433	2.441		4230	9	18:1	1.31 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.476	2.476	3	789993	18	>100:1			1000.00	933.33	91.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.476	2.476	3/0	81894	24	76:1	Target = 16.42		100.00	108.26		
313 > 119	49	2.476	2.476		5176	19	22:1	15.82 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.594	2.594	2	905272	19	>100:1			5000.00	6373.44	139.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.594	2.594	2/0	25791	18	56:1	Target = 0.77		200.00	177.96		
285 > 185	66	2.594	2.594		37191	17	>100:1	0.69 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.862	2.862	3	850037	17	>100:1			1000.00	957.45	81.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.862	2.862	3/0	82877	16	>100:1	Target = 3.14		100.00	109.95		
363 > 169	47	2.862	2.862		24803	16	79:1	3.34 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.880	2.880	3	251509	19	>100:1			1000.00	1001.11	96	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.880	2.880	0/-3	26182	25	>100:1	Target = 3.31	0.16	91.000	92.920		
399 > 99	45	2.880	2.880		7878	21	30:1	3.32 (1.66-4.98)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.898	2.898	3/0	135309	20	>100:1	Target = 2.54		94.200	103.15		
377 > 85	45	2.905	2.898		47336	19	>100:1	2.85 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.259	3.259	3/0	23980	21	>100:1	Target = 3.57		95.200	98.583		
449 > 99	45	3.265	3.259		7074	17	75:1	3.38 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.227	3.227	0	175345	24	>100:1			5000.00	4728.30	98	M
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													a
427 > 407	64	3.220	3.220	0/-3	11782	16	>100:1	Target = 1.48		94.800	122.79		
427 > 81	64	3.233	3.220		7324	18	37:1	1.60 (0.74-2.23)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.252	3.252	3	794632	21	>100:1			1000.00	930.38	80.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.259	3.259	3/0	85240	21	70:1	Target = 2.75		100.00	110.04		
413 > 169	53	3.259	3.259		32194	20	98:1	2.64 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.628	3.628	0	216951	19	>100:1			1000.00	1016.53	95.4	M
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.628	3.628	0/-3	23166	37	81:1	Target = 3.90	0.27	92.800	78.637		
499 > 99	54	3.635	3.628		6529	29	50:1	3.54 (1.95-5.85)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.836	3.836	3/0	58798	18	>100:1			93.200	97.740		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.975	3.975	0/-3	22187	13	>100:1	Target = 3.46		96.000	117.46		M
549 > 99	54	3.967	3.975		7117	18	35:1	3.11 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.265	4.265	4/1	21700	17	>100:1	Target = 3.36		96.400	107.83		
599 > 99	54	4.265	4.265		5224	22	29:1	4.15 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.423	4.423	4/1	52210	15	>100:1			94.200	96.957		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.763	4.763	4/1	18413	20	>100:1	Target = 3.51		96.800	98.481		
699 > 99	54	4.757	4.763		5600	14	81:1	3.28 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.635	3.635	3	849072	19	>100:1			1000.00	959.32	88.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.635	3.635	3/0	77044	22	>100:1	Target = 4.84		100.00	106.94		
463 > 169	56	3.635	3.635		16693	23	>100:1	4.61 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.904	3.904	1	444832	19	>100:1			1000.00	1109.50	113.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.904	3.904	0/-1	48839	15	79:1	Target = 42.34		100.00	111.08		M
498>478	55	3.911	3.904		1382	13	9.7:1	35.33 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.975	3.975	0	169362	15	>100:1			5000.00	5930.90	128.2	M
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.967	3.967	3/-1	5271	22	24:1	Target = 1.37		95.800	100.47		
527 > 81	65	3.975	3.967		4028	20	22:1	1.30 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.555	4.555	3/-1	5885	15	40:1	Target = 2.23		96.400	81.062		
627 > 80	65	4.571	4.555		2833	15	23:1	2.07 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.975	3.975	3	751551	16	>100:1			1000.00	1045.59	91.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.975	3.975	3/0	68381	18	>100:1	Target = 11.16		100.00	100.24		
513 > 169	51	3.985	3.975		7162	22	41:1	9.54 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.136	4.136	4	992885	17	>100:1			5000.00	5545.71	115.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.136	4.136	0/-4	15419	30	80:1	Target = 1.39	0.10	100.00	105.39		
570 > 483	58	4.136	4.136		11113	30	55:1	1.38 (0.69-2.09)	0.13				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.284	4.284	4	742712	16	>100:1			1000.00	1104.38	100.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.284	4.284	4/0	63161	19	>100:1	Target = 10.79		100.00	94.664		
563 > 169	52	4.284	4.284		8068	19	64:1	7.82 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.284	4.284	3	908700	17	>100:1			5000.00	5611.22	109.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.293	4.293	0/-3	15788	32	>100:1	Target = 1.79	0.07	100.00	90.581		M
584 > 526	60	4.293	4.293		9981	35	40:1	1.58 (0.89-2.69)	0.31				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.302	4.302	0	176961	17	>100:1			1000.00	1179.20	121.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.312	4.312	0/0	18198	15	42:1			100.00	108.26		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.321	4.321	0	68029	15	>100:1			1000.00	1143.76	112.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.330	4.330	0/0	9130	12	44:1	Target = 1.04		100.00	132.34		
512 > 219	57	4.330	4.330		4599	15	26:1	1.98 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.555	4.555	4	749501	17	>100:1			1000.00	1033.66	93.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.555	4.555	4/0	79620	17	38:1	Target = 7.82		100.00	111.29		
613 > 169	38	4.555	4.555		9635	19	74:1	8.26 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.791	4.791	4/0	32991	21	>100:1	Target = 3.35		100.00	110.52		
663 > 169	38	4.796	4.791		10356	23	>100:1	3.18 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.465	4.465	0	178927	17	>100:1			1000.00	1248.09	132.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.473	4.473	0/0	14109	12	54:1			100.00	96.816		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.490	4.490	1	60082	16	>100:1			1000.00	1045.93	117.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.498	4.498	1/0	5229	13	31:1	Target = 1.06		100.00	82.891		
526 > 219	59	4.490	4.498		6110	14	34:1	0.85 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.014	5.014	5	909223	20	>100:1			1000.00	1149.73	105.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.014	5.014	5/0	71819	19	19:1	Target = 9.29		100.00	97.147		
713 > 169	42	5.014	5.014		7249	17	73:1	9.90 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.416	5.416	6	572782	17	>100:1			1000.00	1406.45	149.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.416	5.416	6/0	92761	18	8.9:1	Target = 13.38		100.00	100.73		
813 > 269	40	5.416	5.416		7458	18	>100:1	12.43 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.816	5.816	9/3	68542	23	>100:1	Target = 106.35		100.00	100.75		
913 > 319	40	5.816	5.816		637	20	37:1	107.60 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.985	3.985	4	720639	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.476	2.476	3	715596	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.259	3.259	3	890733	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.727	1.727	2	860449	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.628	3.628	3	209857	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072521-DOD.b\072521006.d
Injection Date: 25-Jul-2021 12:33:30 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	204.95	102.5	70 - 130
D 46 13C4_PFBA	895016	884161			98.8	50 - 150
D 50 13C5_PFPeA	915140	866382			94.7	50 - 150
21 PFPeA			200.00	206.40	103.2	70 - 130
D 44 13C3_PFBS	285750	294543			103.1	50 - 150
7 PFBS			176.80	164.63	93.1	70 - 130
1 4:2 FTS			186.80	207.85	111.3	70 - 130
D 63 13C2_4:2 FTS_2	177921	175292			98.5	50 - 150
D 49 13C5_PFHxA	789993	784610			99.3	50 - 150
15 PFHxA			200.00	207.43	103.7	70 - 130
22 PFPeS			187.60	178.65	95.2	70 - 130
28 GenX			400.00	361.38	90.3	70 - 130
D 66 13C3_GenX	905272	870799			96.2	50 - 150
D 47 13C4_PFHpA	850037	799006			94	50 - 150
13 PFHpA			200.00	241.26	120.6	70 - 130
D 45 13C3_PFHxS	251509	236898			94.2	50 - 150
14 PFHxS			182.00	195.05	107.2	70 - 130
29 ADONA			188.40	196.95	104.5	70 - 130
D 64 13C2_6:2 FTS_2	175345	160838			91.7	50 - 150
2 6:2 FTS			189.60	193.43	102	70 - 130
20 PFOA			200.00	218.52	109.3	70 - 130
D 53 13C8_PFOA	794632	834065			105	50 - 150
12 PFHpS			190.40	205.70	108	70 - 130
18 PFOS			185.60	172.66	93	70 - 130
D 54 13C8_PFOS	216951	209036			96.4	50 - 150
17 PFNA			200.00	225.69	112.8	70 - 130
D 56 13C9_PFNA	849072	766098			90.2	50 - 150
30 9Cl-PF3ONS			186.40	201.66	108.2	70 - 130
D 55 13C8_PFOSA	444832	414408			93.2	50 - 150
19 PFOSA			200.00	227.00	113.5	70 - 130
16 PFNS			192.00	204.74	106.6	70 - 130
D 65 13C2_8:2 FTS_2	169362	148250			87.5	50 - 150
3 8:2 FTS			191.60	196.35	102.5	70 - 130
10 PFDA			200.00	206.90	103.4	70 - 130
D 51 13C6_PFDA	751551	771494			102.7	50 - 150
6 N-MeFOSAA			200.00	206.59	103.3	70 - 130

Report Date: 28-Jul-2021 06:40:18 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\ORGANICS\LL\LCMSMS01.i\072521-DOD.b\072521006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	992885	936428			94.3	50 - 150
9 PFDS			192.80	213.94	111	70 - 130
D 52 13C7_PFUdA	742712	724741			97.6	50 - 150
5 N-EtFOSAA			200.00	181.47	90.7	70 - 130
25 PFUdA			200.00	198.97	99.5	70 - 130
D 60 d5-EtFOSAA	908700	900195			99.1	50 - 150
D 61 d7-MeFOSE	176961	206661			116.8	50 - 150
32 MeFOSE			200.00	173.12	86.6	70 - 130
26 MeFOSA			200.00	244.86	122.4	70 - 130
D 57 d3-MeFOSA	68029	57078			83.9	50 - 150
31 11Cl-PF3OUDS			188.40	225.76	119.8	70 - 130
D 62 d9-EtFOSE	178927	176889			98.9	50 - 150
11 PFDoA			200.00	189.55	94.8	70 - 130
D 38 13C2_PFDoA	749501	811153			108.2	50 - 150
4 10:2 FTS			192.80	225.53	117	70 - 130
33 EtFOSE			200.00	190.08	95	70 - 130
D 59 d5-EtFOSA	60082	53777			89.5	50 - 150
27 EtFOSA			200.00	211.36	105.7	70 - 130
34 PFDOS			193.60	220.74	114	70 - 130
24 PFTrDA			200.00	215.53	107.8	70 - 130
23 PFTeDA			200.00	201.80	100.9	70 - 130
D 42 13C2_PFTeDA	909223	889333			97.8	50 - 150
35 PFHxDA			200.00	187.09	93.5	70 - 130
D 40 13C2_PFHxDA	572782	573355			100.1	50 - 150
36 PFODA			200.00	195.47	97.7	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072521-DOD.b\072521006.d
Injection Date: 25-Jul-2021 12:33:30 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.721	1.721	0	884161	19	>100:1			1000.00	952.93	98.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.721	1.727	0/0	185028	21	>100:1			200.00	204.95		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.089	2.099	0	866382	16	>100:1			1000.00	897.64	94.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.089	2.099	0/0	178302	16	>100:1			200.00	206.40		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.151	0	294543	15	>100:1			1000.00	1035.58	103.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.151	0/0	66768	21	>100:1	Target = 3.65		176.80	164.63		
298.9 > 99	44	2.141	2.151		19768	15	>100:1	3.37 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.502	2.511	0/0	53739	17	>100:1	Target = 3.30		187.60	178.65		
349 > 99	44	2.502	2.511		18537	18	>100:1	2.89 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.424	2.433	0	175292	18	>100:1			5000.00	3818.11	98.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.424	2.441	-1/-1	12848	16	89:1	Target = 1.50		186.80	207.85		
327 > 81	63	2.424	2.441		10464	21	53:1	1.22 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.467	2.476	0	784610	18	>100:1			1000.00	926.97	99.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.467	2.476	0/0	155835	18	>100:1	Target = 16.42		200.00	207.43		
313 > 119	49	2.467	2.476		9914	18	63:1	15.71 (8.21-24.64)					M
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.594	2.594	1	870799	19	>100:1			5000.00	6130.74	96.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.587	2.594	0/-1	50378	18	>100:1	Target = 0.77		400.00	361.38		
285 > 185	66	2.587	2.594		86854	18	>100:1	0.58 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.854	2.862	0	799006	18	>100:1			1000.00	899.97	94	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.862	2.862	1/1	170937	18	>100:1	Target = 3.14		200.00	241.26		
363 > 169	47	2.854	2.862		47885	19	>100:1	3.56 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.871	2.880	0	236898	17	>100:1			1000.00	942.95	94.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.871	2.880	0/0	51766	24	>100:1	Target = 3.31	0.15	182.00	195.05		
399 > 99	45	2.871	2.880		17409	26	>100:1	2.97 (1.66-4.98)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.898	2.898	1/1	243349	18	>100:1	Target = 2.54		188.40	196.95		
377 > 85	45	2.905	2.898		91896	20	>100:1	2.64 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.259	3.259	1/1	47130	21	>100:1	Target = 3.57		190.40	205.70		
449 > 99	45	3.259	3.259		12899	25	>100:1	3.65 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.220	3.227	0	160838	21	>100:1			5000.00	4337.11	91.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.233	3.220	1/1	15075	16	>100:1	Target = 1.48		189.60	193.43		
427 > 81	64	3.227	3.220		12284	25	66:1	1.22 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.252	3.252	1	834065	22	>100:1			1000.00	976.55	105	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.252	3.259	0/-1	177676	18	>100:1	Target = 2.75		200.00	218.52		
413 > 169	53	3.259	3.259		66307	22	>100:1	2.67 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.621	3.628	0	209036	20	>100:1			1000.00	979.44	96.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.628	3.628	1/1	43274	38	>100:1	Target = 3.90	0.29	185.60	172.66		
499 > 99	54	3.621	3.628		13367	37	>100:1	3.23 (1.95-5.85)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.829	3.836	0/0	116886	19	>100:1			186.40	201.66		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.958	3.975	-1/-1	37263	18	>100:1	Target = 3.46		192.00	204.74		
549 > 99	54	3.958	3.975		10627	21	50:1	3.50 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.265	4.265	1/1	41482	16	>100:1	Target = 3.36		192.80	213.94		
599 > 99	54	4.265	4.265		12996	24	87:1	3.19 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.416	4.423	0/0	117134	18	>100:1			188.40	225.76		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.763	4.763	1/1	39766	30	>100:1	Target = 3.51		193.60	220.74		
699 > 99	54	4.763	4.763		11092	19	>100:1	3.58 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.628	3.635	0	766098	19	>100:1			1000.00	865.57	90.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.628	3.635	0/0	146711	18	>100:1	Target = 4.84		200.00	225.69		
463 > 169	56	3.628	3.635		31669	19	>100:1	4.63 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.896	3.904	0	414408	18	>100:1			1000.00	1033.62	93.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.896	3.904	0/0	92978	26	>100:1	Target = 42.34		200.00	227.00		
498>478	55	3.904	3.904		2314	22	21:1	40.18 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.967	3.975	0	148250	17	>100:1			5000.00	5191.58	87.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.976	3.967	1/1	9017	23	50:1	Target = 1.37		191.60	196.35		
527 > 81	65	3.967	3.967		6038	14	36:1	1.49 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.563	4.555	1/1	14332	17		Target = 2.23		192.80	225.53		
627 > 80	65	4.563	4.555		4518	19	27:1	3.17 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.976	3.975	1	771494	18	>100:1			1000.00	1073.33	102.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.976	3.975	1/0	144880	19	>100:1	Target = 11.16		200.00	206.90		
513 > 169	51	3.976	3.975		11444	19	61:1	12.65 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.128	4.136	0	936428	17	>100:1			5000.00	5230.37	94.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.128	4.136	0/0	28505	27	>100:1	Target = 1.39	0.08	200.00	206.59		
570 > 483	58	4.136	4.136		19697	34	>100:1	1.44 (0.69-2.09)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.284	4.284	1	724741	16	>100:1			1000.00	1077.66	97.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.284	4.284	1/0	129542	15	>100:1	Target = 10.79		200.00	198.97		
563 > 169	52	4.275	4.284		13186	21	94:1	9.82 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.284	4.284	1	900195	16	>100:1			5000.00	5558.70	99.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.293	4.293	1/0	31333	33	>100:1	Target = 1.79	0.07	200.00	181.47		M
584 > 526	60	4.284	4.293		17507	28	82:1	1.78 (0.89-2.69)	0.11				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.302	4.302	1	206661	15	>100:1			1000.00	1377.11	116.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.321	4.312	1/0	33985	16	95:1			200.00	173.12		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.330	4.321	1	57078	14	>100:1			1000.00	959.65	83.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.330	4.330	1/0	14173	22	49:1	Target = 1.04		200.00	244.86		
512 > 219	57	4.330	4.330		12147	14	51:1	1.16 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.547	4.555	0	811153	18	>100:1			1000.00	1118.68	108.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.547	4.555	0/0	146768	15	78:1	Target = 7.82		200.00	189.55		
613 > 169	38	4.547	4.555		22687	19	>100:1	6.46 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.791	4.791	1/1	69628	20	>100:1	Target = 3.35		200.00	215.53		
663 > 169	38	4.786	4.791		21782	28	>100:1	3.19 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.465	4.465	1	176889	19	>100:1			1000.00	1233.87	98.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.482	4.473	1/0	27385	14	79:1			200.00	190.08		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.490	4.490	1	53777	16	>100:1			1000.00	936.17	89.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.498	4.498	1/0	11934	14	>100:1	Target = 1.06		200.00	211.36		
526 > 219	59	4.498	4.498		12493	17	64:1	0.95 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.007	5.014	0	889333	19	>100:1			1000.00	1124.57	97.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.007	5.014	0/0	145924	20	25:1	Target = 9.29		200.00	201.80		
713 > 169	42	5.007	5.014		15460	18	>100:1	9.43 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.407	5.416	0	573355	17	>100:1			1000.00	1407.86	100.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.407	5.416	0/0	172471	17	16:1	Target = 13.38		200.00	187.09		
813 > 269	40	5.407	5.416		13154	17	>100:1	13.11 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.795	5.816	-1/-1	133116	24	14:1	Target = 106.35		200.00	195.47		
913 > 319	40	5.802	5.816		1336	21	54:1	99.63 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.976	3.985	0	741476	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.467	2.476	0	727467	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.252	3.259	0	851655	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.721	1.727	0	832272	18	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.628	3.628	1	215268	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File:	\\Organics\LL\LCMSMS01.i\072521-DOD.b\072521062.d		
Injection Date:	25-Jul-2021 22:25:58	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	51
Sample Info:	ID CCV 1000C_SVLC-1573	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	907.15	90.7	70 - 130
D 46 13C4_PFBA	895016	746815			83.4	50 - 150
D 50 13C5_PFPeA	915140	765628			83.7	50 - 150
21 PFPeA			1000.00	884.69	88.5	70 - 130
D 44 13C3_PFBS	285750	233198			81.6	50 - 150
7 PFBS			884.00	839.33	94.9	70 - 130
1 4:2 FTS			934.00	938.72	100.5	70 - 130
D 63 13C2_4:2 FTS_2	177921	133905			75.3	50 - 150
D 49 13C5_PFHxA	789993	652431			82.6	50 - 150
15 PFHxA			1000.00	931.35	93.1	70 - 130
22 PFPeS			938.00	839.47	89.5	70 - 130
28 GenX			2000.00	1702.38	85.1	70 - 130
D 66 13C3_GenX	905272	690672			76.3	50 - 150
D 47 13C4_PFHpA	850037	663454			78.1	50 - 150
13 PFHpA			1000.00	1042.82	104.3	70 - 130
D 45 13C3_PFHxS	251509	215307			85.6	50 - 150
14 PFHxS			910.00	844.85	92.8	70 - 130
29 ADONA			942.00	774.70	82.2	70 - 130
D 64 13C2_6:2 FTS_2	175345	123559			70.5	50 - 150
2 6:2 FTS			948.00	968.59	102.2	70 - 130
20 PFOA			1000.00	898.36	89.8	70 - 130
D 53 13C8_PFOA	794632	706080			88.9	50 - 150
12 PFHpS			952.00	850.68	89.4	70 - 130
18 PFOS			928.00	815.67	87.9	70 - 130
D 54 13C8_PFOS	216951	198592			91.5	50 - 150
17 PFNA			1000.00	983.26	98.3	70 - 130
D 56 13C9_PFNA	849072	693146			81.6	50 - 150
30 9Cl-PF3ONS			932.00	740.27	79.4	70 - 130
D 55 13C8_PFOSA	444832	339662			76.4	50 - 150
19 PFOSA			1000.00	1027.98	102.8	70 - 130
16 PFNS			960.00	842.81	87.8	70 - 130
D 65 13C2_8:2 FTS_2	169362	103653			61.2	50 - 150
3 8:2 FTS			958.00	1136.08	118.6	70 - 130
10 PFDA			1000.00	902.89	90.3	70 - 130
D 51 13C6_PFDA	751551	634402			84.4	50 - 150
6 N-MeFOSAA			1000.00	1069.72	107	70 - 130

Report Date: 28-Jul-2021 06:40:21 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072521-DOD.b\072521062.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	992885	715800			72.1	50 - 150
9 PFDS			964.00	776.86	80.6	70 - 130
D 52 13C7_PFUdA	742712	600699			80.9	50 - 150
5 N-EtFOSAA			1000.00	973.06	97.3	70 - 130
25 PFUdA			1000.00	840.39	84	70 - 130
D 60 d5-EtFOSAA	908700	672895			74.1	50 - 150
D 61 d7-MeFOSE	176961	145848			82.4	50 - 150
32 MeFOSE			1000.00	889.84	89	70 - 130
26 MeFOSA			1000.00	1075.87	107.6	70 - 130
D 57 d3-MeFOSA	68029	43524			64	50 - 150
31 11Cl-PF3OUDS			942.00	736.52	78.2	70 - 130
D 62 d9-EtFOSE	178927	129358			72.3	50 - 150
11 PFDoA			1000.00	966.52	96.7	70 - 130
D 38 13C2_PFDoA	749501	657686			87.7	50 - 150
4 10:2 FTS			964.00	1059.24	109.9	70 - 130
33 EtFOSE			1000.00	1035.51	103.6	70 - 130
D 59 d5-EtFOSA	60082	47587			79.2	50 - 150
27 EtFOSA			1000.00	1001.86	100.2	70 - 130
34 PFDOS			968.00	816.75	84.4	70 - 130
24 PFTrDA			1000.00	916.54	91.7	70 - 130
23 PFTeDA			1000.00	983.22	98.3	70 - 130
D 42 13C2_PFTeDA	909223	667404			73.4	50 - 150
35 PFHxDA			1000.00	886.18	88.6	70 - 130
D 40 13C2_PFHxDA	572782	427932			74.7	50 - 150
36 PFODA			1000.00	1036.28	103.6	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072521-DOD.b\072521062.d
Injection Date: 25-Jul-2021 22:25:58 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 51
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.714	1.721	1	746815	19	>100:1			1000.00	804.90	83.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.721	1.727	1/0	691749	20	>100:1			1000.00	907.15		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.078	2.099	1	765628	16	>100:1			1000.00	793.25	83.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.078	2.099	1/0	675381	15	>100:1			1000.00	884.69		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.151	2	233198	15	>100:1			1000.00	819.90	81.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.151	2/0	269506	16	>100:1	Target = 3.65		884.00	839.33		
298.9 > 99	44	2.130	2.151		69110	21	>100:1	3.89 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.493	2.511	2/0	199927	18	>100:1	Target = 3.30		938.00	839.47		
349 > 99	44	2.493	2.511		63089	19	>100:1	3.16 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.433	1	133905	17	>100:1			5000.00	2916.64	75.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.415	2.441	2/1	44326	19	>100:1	Target = 1.50		934.00	938.72		
327 > 81	63	2.415	2.441		31663	23	>100:1	1.39 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.459	2.476	2	652431	17	>100:1			1000.00	770.81	82.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.476	1/-1	581824	18	>100:1	Target = 16.42		1000.00	931.35		
313 > 119	49	2.459	2.476		35331	18	>100:1	16.46 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.571	2.594	1	690672	18	>100:1			5000.00	4862.58	76.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.579	2.594	1/0	188229	17	>100:1	Target = 0.77		2000.00	1702.38		
285 > 185	66	2.579	2.594		285453	19	>100:1	0.65 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.846	2.862	2	663454	18	>100:1			1000.00	747.29	78.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.846	2.862	2/0	613499	18	>100:1	Target = 3.14		1000.00	1042.82		
363 > 169	47	2.837	2.862		162608	17	>100:1	3.77 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.855	2.880	2	215307	19	>100:1			1000.00	857.01	85.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.863	2.880	2/0	203786	24	>100:1	Target = 3.31	0.14	910.00	844.85		
399 > 99	45	2.855	2.880		57935	25	>100:1	3.51 (1.66-4.98)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.881	2.898	2/0	869973	18	>100:1	Target = 2.54		942.00	774.70		
377 > 85	45	2.881	2.898		351978	19	>100:1	2.47 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.236	3.259	2/0	177142	23	>100:1	Target = 3.57		952.00	850.68		
449 > 99	45	3.229	3.259		51483	22	>100:1	3.44 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.204	3.227	2	123559	24	>100:1			5000.00	3331.86	70.5	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.204	3.220	2/0	47562	19	>100:1	Target = 1.48		948.00	968.59		
427 > 81	64	3.204	3.220		27210	20	>100:1	1.74 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.236	3.252	2	706080	21	>100:1			1000.00	826.70	88.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.229	3.259	2/0	618352	23	>100:1	Target = 2.75		1000.00	898.36		
413 > 169	53	3.229	3.259		238140	23	>100:1	2.59 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.602	3.628	2	198592	26	>100:1			1000.00	930.51	91.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.602	3.628	2/0	177255	38	21:1	Target = 3.90	0.26	928.00	815.67		
499 > 99	54	3.602	3.628		43201	33	>100:1	4.10 (1.95-5.85)	0.13				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.804	3.836	2/0	407647	19	>100:1			932.00	740.27		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.939	3.975	2/0	145729	17	>100:1	Target = 3.46		960.00	842.81		
549 > 99	54	3.939	3.975		51162	20	>100:1	2.84 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.235	4.265	2/0	143106	15	>100:1	Target = 3.36		964.00	776.86		
599 > 99	54	4.235	4.265		45897	16		3.11 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.390	4.423	2/0	363042	16	>100:1			942.00	736.52		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.725	4.763	2/0	139785	19	>100:1	Target = 3.51		968.00	816.75		
699 > 99	54	4.731	4.763		43516	19		3.21 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.602	3.635	2	693146	19	>100:1			1000.00	783.14	81.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.610	3.635	2/0	578296	21	>100:1	Target = 4.84		1000.00	983.26		
463 > 169	56	3.602	3.635		126925	20	>100:1	4.55 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.901	3.904	2	339662	20	>100:1			1000.00	847.19	76.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.893	3.904	1/-1	345107	18	>100:1	Target = 42.34		1000.00	1027.98		
498>478	55	3.893	3.904		8545	16	71:1	40.38 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.939	3.975	2	103653	21	>100:1			5000.00	3629.83	61.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.939	3.967	2/0	36477	17	>100:1	Target = 1.37		958.00	1136.08		
527 > 81	65	3.923	3.967		21049	14	>100:1	1.73 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.521	4.555	1/-1	47064	18	>100:1	Target = 2.23		964.00	1059.24		
627 > 80	65	4.521	4.555		20062	19	>100:1	2.34 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.947	3.975	2	634402	19	>100:1			1000.00	882.61	84.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.947	3.975	2/0	519905	18	>100:1	Target = 11.16		1000.00	902.89		
513 > 169	51	3.947	3.975		50503	15	>100:1	10.29 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.101	4.136	2	715800	16	>100:1			5000.00	3998.06	72.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.101	4.136	-2/-4	112826	34	>100:1	Target = 1.39	0.08	1000.00	1069.72		M
570 > 483	58	4.101	4.136		76708	30	>100:1	1.47 (0.69-2.09)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.254	4.284	2	600699	15	>100:1			1000.00	893.22	80.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.254	4.284	2/0	453504	17	>100:1	Target = 10.79		1000.00	840.39		
563 > 169	52	4.254	4.284		39154	14	>100:1	11.58 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.254	4.284	2	672895	16	>100:1			5000.00	4155.13	74.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.263	4.293	-1/-3	125591	33		Target = 1.79		1000.00	973.06		M
584 > 526	60	4.263	4.293		80101	31	>100:1	1.56 (0.89-2.69)	0.07				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.309	4.302	1	145848	15	>100:1			1000.00	971.88	82.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.319	4.312	1/0	123277	18	>100:1			1000.00	889.84		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.328	4.321	1	43524	16	>100:1			1000.00	731.76	64	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.337	4.330	1/0	47486	17	>100:1	Target = 1.04		1000.00	1075.87		
512 > 219	57	4.337	4.330		49690	21	>100:1	0.95 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.521	4.555	2	657686	18	>100:1			1000.00	907.03	87.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.555	2/0	606775	17	>100:1	Target = 7.82		1000.00	966.52		
613 > 169	38	4.521	4.555		67867	19	>100:1	8.94 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.756	4.791	2/0	240076	19	>100:1	Target = 3.35		1000.00	916.54		
663 > 169	38	4.749	4.791		76248	21	>100:1	3.14 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.472	4.465	1	129358	17	>100:1			1000.00	902.32	72.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.480	4.473	1/0	109099	18	>100:1			1000.00	1035.51		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.496	4.490	1	47587	18	>100:1			1000.00	828.42	79.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.496	4.498	1/0	50057	19	>100:1	Target = 1.06		1000.00	1001.86		
526 > 219	59	4.496	4.498		48799	21	>100:1	1.02 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	5.014	2	667404	16	>100:1			1000.00	843.94	73.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.972	5.014	2/0	533554	18	95:1	Target = 9.29		1000.00	983.22		
713 > 169	42	4.964	5.014		62542	18	>100:1	8.53 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.347	5.416	2	427932	17	>100:1			1000.00	1050.78	74.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.355	5.416	3/1	609720	17	78:1	Target = 13.38		1000.00	886.18		
813 > 269	40	5.355	5.416		48809	16	>100:1	12.49 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.714	5.816	3/1	526717	23	78:1	Target = 106.35		1000.00	1036.28		
913 > 319	40	5.714	5.816		5493	23	>100:1	95.88 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.947	3.985	2	575477	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.476	2	596046	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.236	3.259	2	689039	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.714	1.727	1	678550	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.602	3.628	2	180419	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072521-DOD.b\072521070.d
Injection Date: 25-Jul-2021 23:50:40 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 57
Sample Info: CCV 1000D_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	921.79	92.2	70 - 130
D 46 13C4_PFBA	895016	822268			91.9	50 - 150
D 50 13C5_PFPeA	915140	818187			89.4	50 - 150
21 PFPeA			1000.00	1044.37	104.4	70 - 130
D 44 13C3_PFBS	285750	262822			92	50 - 150
7 PFBS			884.00	774.93	87.7	70 - 130
1 4:2 FTS			934.00	764.35	81.8	70 - 130
D 63 13C2_4:2 FTS_2	177921	161827			91	50 - 150
D 49 13C5_PFHxA	789993	742590			94	50 - 150
15 PFHxA			1000.00	896.52	89.7	70 - 130
22 PFPeS			938.00	846.97	90.3	70 - 130
28 GenX			2000.00	1692.46	84.6	70 - 130
D 66 13C3_GenX	905272	805172			88.9	50 - 150
D 47 13C4_PFHpA	850037	777775			91.5	50 - 150
13 PFHpA			1000.00	925.35	92.5	70 - 130
D 45 13C3_PFHxS	251509	234611			93.3	50 - 150
14 PFHxS			910.00	834.87	91.7	70 - 130
29 ADONA			942.00	773.60	82.1	70 - 130
D 64 13C2_6:2 FTS_2	175345	137888			78.6	50 - 150
2 6:2 FTS			948.00	1008.50	106.4	70 - 130
20 PFOA			1000.00	883.26	88.3	70 - 130
D 53 13C8_PFOA	794632	787411			99.1	50 - 150
12 PFHpS			952.00	925.66	97.2	70 - 130
18 PFOS			928.00	868.49	93.6	70 - 130
D 54 13C8_PFOS	216951	207020			95.4	50 - 150
17 PFNA			1000.00	1033.78	103.4	70 - 130
D 56 13C9_PFNA	849072	791685			93.2	50 - 150
30 9Cl-PF3ONS			932.00	836.76	89.8	70 - 130
D 55 13C8_PFOSA	444832	375589			84.4	50 - 150
19 PFOSA			1000.00	925.02	92.5	70 - 130
16 PFNS			960.00	831.90	86.7	70 - 130
D 65 13C2_8:2 FTS_2	169362	125419			74.1	50 - 150
3 8:2 FTS			958.00	1097.73	114.6	70 - 130
10 PFDA			1000.00	1112.43	111.2	70 - 130
D 51 13C6_PFDA	751551	711976			94.7	50 - 150
6 N-MeFOSAA			1000.00	1036.02	103.6	70 - 130

Report Date: 28-Jul-2021 06:40:31 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072521-DOD.b\072521070.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	992885	826744			83.3	50 - 150
9 PFDS			964.00	796.68	82.6	70 - 130
D 52 13C7_PFUdA	742712	679949			91.5	50 - 150
5 N-EtFOSAA			1000.00	1053.45	105.3	70 - 130
25 PFUdA			1000.00	896.24	89.6	70 - 130
D 60 d5-EtFOSAA	908700	720615			79.3	50 - 150
D 61 d7-MeFOSE	176961	157422			89	50 - 150
32 MeFOSE			1000.00	968.07	96.8	70 - 130
26 MeFOSA			1000.00	932.62	93.3	70 - 130
D 57 d3-MeFOSA	68029	48577			71.4	50 - 150
31 11Cl-PF3OUDS			942.00	797.85	84.7	70 - 130
D 62 d9-EtFOSE	178927	146320			81.8	50 - 150
11 PFDoA			1000.00	865.07	86.5	70 - 130
D 38 13C2_PFDoA	749501	752182			100.4	50 - 150
4 10:2 FTS			964.00	907.79	94.2	70 - 130
33 EtFOSE			1000.00	1000.48	100	70 - 130
D 59 d5-EtFOSA	60082	49961			83.2	50 - 150
27 EtFOSA			1000.00	1077.10	107.7	70 - 130
34 PFDOS			968.00	865.21	89.4	70 - 130
24 PFTrDA			1000.00	951.33	95.1	70 - 130
23 PFTeDA			1000.00	904.07	90.4	70 - 130
D 42 13C2_PFTeDA	909223	826305			90.9	50 - 150
35 PFHxDA			1000.00	936.12	93.6	70 - 130
D 40 13C2_PFHxDA	572782	473694			82.7	50 - 150
36 PFODA			1000.00	1022.24	102.2	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072521-DOD.b\072521070.d
Injection Date: 25-Jul-2021 23:50:40 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 57
Sample Info: CCV 1000D_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.721	1	822268	19	>100:1			1000.00	886.23	91.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.727	0/-1	773931	19	>100:1			1000.00	921.79		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.079	2.099	1	818187	15	>100:1			1000.00	847.70	89.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.079	2.099	1/0	852022	15	>100:1			1000.00	1044.37		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.151	0	262822	15	>100:1			1000.00	924.05	92	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.151	0/0	280439	14	>100:1	Target = 3.65		884.00	774.93		
298.9 > 99	44	2.131	2.151		78515	15	>100:1	3.57 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.485	2.511	0/0	227336	17	>100:1	Target = 3.30		938.00	846.97		
349 > 99	44	2.485	2.511		69270	18	>100:1	3.28 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.433	0	161827	17	>100:1			5000.00	3524.82	91	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.441	0/0	43618	17	>100:1	Target = 1.50		934.00	764.35		
327 > 81	63	2.407	2.441		32093	19	>100:1	1.35 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.476	0	742590	17	>100:1			1000.00	877.33	94	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.476	1/1	637464	18	>100:1	Target = 16.42		1000.00	896.52		
313 > 119	49	2.450	2.476		38761	17	>100:1	16.44 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.572	2.594	1	805172	18	>100:1			5000.00	5668.70	88.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.572	2.594	0/-1	218155	19	>100:1	Target = 0.77		2000.00	1692.46		
285 > 185	66	2.572	2.594		329173	19	>100:1	0.66 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.837	2.862	0	777775	18	>100:1			1000.00	876.05	91.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.837	2.862	0/0	638195	18	>100:1	Target = 3.14		1000.00	925.35		
363 > 169	47	2.837	2.862		203337	18	>100:1	3.13 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.855	2.880	1	234611	18	>100:1			1000.00	933.85	93.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.855	2.880	0/-1	219435	26	>100:1	Target = 3.31	0.18	910.00	834.87		
399 > 99	45	2.855	2.880		67729	25	>100:1	3.23 (1.66-4.98)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.881	2.898	1/0	946617	19	>100:1	Target = 2.54		942.00	773.60		
377 > 85	45	2.881	2.898		369990	17	>100:1	2.55 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.233	3.259	0/-1	210037	22	>100:1	Target = 3.57		952.00	925.66		
449 > 99	45	3.233	3.259		58533	22	>100:1	3.58 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.202	3.227	0	137888	22	>100:1			5000.00	3718.25	78.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.202	3.220	0/0	55145	19	>100:1	Target = 1.48		948.00	1008.50		
427 > 81	64	3.195	3.220		34518	20	>100:1	1.59 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.221	3.252	0	787411	22	>100:1			1000.00	921.93	99.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.227	3.259	0/0	677988	21	>100:1	Target = 2.75		1000.00	883.26		
413 > 169	53	3.227	3.259		251213	22	>100:1	2.69 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.598	3.628	0	207020	19	>100:1			1000.00	970.00	95.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.598	3.628	-1/-1	196436	39	19:1	Target = 3.90	0.23	928.00	868.49		M
499 > 99	54	3.598	3.628		54729	38	>100:1	3.58 (1.95-5.85)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.802	3.836	0/0	480336	19	>100:1			932.00	836.76		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.937	3.975	0/0	149948	17	>100:1	Target = 3.46		960.00	831.90		
549 > 99	54	3.937	3.975		42568	21	>100:1	3.52 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.232	4.265	0/0	152985	16	>100:1	Target = 3.36		964.00	796.68		
599 > 99	54	4.232	4.265		54718	14	>100:1	2.79 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.388	4.423	0/0	409961	17	>100:1			942.00	797.85		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.723	4.763	0/0	154364	18	>100:1	Target = 3.51		968.00	865.21		
699 > 99	54	4.723	4.763		42948	18	>100:1	3.59 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.598	3.635	0	791685	18	>100:1			1000.00	894.48	93.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.606	3.635	0/0	694448	19	>100:1	Target = 4.84		1000.00	1033.78		
463 > 169	56	3.598	3.635		127524	19	>100:1	5.44 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.891	3.904	0	375589	19	>100:1			1000.00	936.80	84.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.891	3.904	0/0	343388	19	>100:1	Target = 42.34		1000.00	925.02		
498>478	55	3.891	3.904		10033	26		34.22 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.975	0	125419	23	>100:1			5000.00	4392.06	74.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.967	0/0	42647	22	>100:1	Target = 1.37		958.00	1097.73		
527 > 81	65	3.937	3.967		24134	15	>100:1	1.76 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.527	4.555	1/1	48805	16	>100:1	Target = 2.23		964.00	907.79		
627 > 80	65	4.527	4.555		21049	15	>100:1	2.31 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.945	3.975	0	711976	17	>100:1			1000.00	990.53	94.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.937	3.975	0/0	718893	17	>100:1	Target = 11.16		1000.00	1112.43		
513 > 169	51	3.945	3.975		55403	16	>100:1	12.97 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.136	0	826744	17	>100:1			5000.00	4617.73	83.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.098	4.136	0/0	126207	27	>100:1	Target = 1.39	0.09	1000.00	1036.02		
570 > 483	58	4.106	4.136		84556	33	>100:1	1.49 (0.69-2.09)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.250	4.284	0	679949	17	>100:1			1000.00	1011.06	91.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.250	4.284	0/0	547454	16	>100:1	Target = 10.79		1000.00	896.24		
563 > 169	52	4.250	4.284		48867	14	>100:1	11.20 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.250	4.284	0	720615	16	>100:1			5000.00	4449.80	79.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.260	4.293	-1/-1	145608	34	>100:1	Target = 1.79	0.07	1000.00	1053.45		M
584 > 526	60	4.260	4.293		84537	32	>100:1	1.72 (0.89-2.69)	0.21				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.307	4.302	0	157422	15	>100:1			1000.00	1049.00	89	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.325	4.312	1/1	144759	15	>100:1			1000.00	968.07		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.334	4.321	1	48577	15	>100:1			1000.00	816.72	71.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.334	4.330	0/-1	45942	14	100:1	Target = 1.04		1000.00	932.62		
512 > 219	57	4.334	4.330		54159	22	88:1	0.84 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.510	4.555	0	752182	15	>100:1			1000.00	1037.35	100.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.518	4.555	1/1	621118	17	>100:1	Target = 7.82		1000.00	865.07		
613 > 169	38	4.518	4.555		82389	23	>100:1	7.53 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.748	4.791	0/0	284994	20	>100:1	Target = 3.35		1000.00	951.33		
663 > 169	38	4.748	4.791		84088	19	>100:1	3.38 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.469	4.465	0	146320	18	>100:1			1000.00	1020.64	81.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.478	4.473	0/0	119230	19	>100:1			1000.00	1000.48		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.494	4.490	0	49961	17	>100:1			1000.00	869.74	83.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.502	4.498	1/1	56501	16	>100:1	Target = 1.06		1000.00	1077.10		
526 > 219	59	4.494	4.498		54030	20	>100:1	1.04 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.959	5.014	0	826305	17	>100:1			1000.00	1044.87	90.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.959	5.014	0/0	607409	17	>100:1	Target = 9.29		1000.00	904.07		
713 > 169	42	4.959	5.014		64455	17	>100:1	9.42 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.343	5.416	0	473694	16	>100:1			1000.00	1163.14	82.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.343	5.416	0/0	712955	19	75:1	Target = 13.38		1000.00	936.12		
813 > 269	40	5.343	5.416		54489	18	>100:1	13.08 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.711	5.816	0/0	575140	22	85:1	Target = 106.35		1000.00	1022.24		
913 > 319	40	5.711	5.816		5956	21	>100:1	96.56 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.945	3.985	0	629296	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.476	0	700538	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.259	0	718824	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.715	1.727	1	754050	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.598	3.628	0	207061	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621005.d
Injection Date: 26-Jul-2021 11:54:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	107.38	107.4	70 - 130
D 46 13C4_PFBA	997866	984692			98.7	50 - 150
D 50 13C5_PFPeA	1059542	1013179			95.6	50 - 150
21 PFPeA			100.00	102.50	102.5	70 - 130
D 44 13C3_PFBS	297147	291659			98.2	50 - 150
7 PFBS			88.400	96.187	108.8	70 - 130
1 4:2 FTS			93.400	70.858	75.9	70 - 130
D 63 13C2_4:2 FTS_2	210753	241646			114.7	50 - 150
D 49 13C5_PFHxA	864384	865478			100.1	50 - 150
15 PFHxA			100.00	118.37	118.4	70 - 130
22 PFPeS			93.800	107.26	114.4	70 - 130
28 GenX			200.00	229.75	114.9	70 - 130
D 66 13C3_GenX	649017	731246			112.7	50 - 150
D 47 13C4_PFHpA	1037869	942733			90.8	50 - 150
13 PFHpA			100.00	99.99	100	70 - 130
D 45 13C3_PFHxS	261903	273340			104.4	50 - 150
14 PFHxS			91.000	88.689	97.5	70 - 130
29 ADONA			94.200	93.551	99.3	70 - 130
D 64 13C2_6:2 FTS_2	179008	218574			122.1	50 - 150
2 6:2 FTS			94.800	124.25	131.1	70 - 130
20 PFOA			100.00	121.27	121.3	70 - 130
D 53 13C8_PFOA	991369	884901			89.3	50 - 150
12 PFHpS			95.200	94.900	99.7	70 - 130
18 PFOS			92.800	86.561	93.3	70 - 130
D 54 13C8_PFOS	227393	230292			101.3	50 - 150
17 PFNA			100.00	107.36	107.4	70 - 130
D 56 13C9_PFNA	954829	914153			95.7	50 - 150
30 9Cl-PF3ONS			93.200	106.32	114.1	70 - 130
D 55 13C8_PFOSA	391661	447921			114.4	50 - 150
19 PFOSA			100.00	97.747	97.7	70 - 130
16 PFNS			96.000	113.07	117.8	70 - 130
D 65 13C2_8:2 FTS_2	132148	181716			137.5	50 - 150
3 8:2 FTS			95.800	119.62	124.9	70 - 130
10 PFDA			100.00	93.838	93.8	70 - 130
D 51 13C6_PFDA	824029	825008			100.1	50 - 150
6 N-MeFOSAA			100.00	100.51	100.5	70 - 130

Report Date: 27-Jul-2021 15:28:59 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	862293	1037750			120.3	50 - 150
9 PFDS			96.400	101.52	105.3	70 - 130
D 52 13C7_PFUdA	741490	775811			104.6	50 - 150
5 N-EtFOSAA			100.00	116.63	116.6	70 - 130
25 PFUdA			100.00	88.909	88.9	70 - 130
D 60 d5-EtFOSAA	830172	934381			112.6	50 - 150
D 61 d7-MeFOSE	145483	133706			91.9	50 - 150
32 MeFOSE			100.00	113.25	113.2	70 - 130
26 MeFOSA			100.00	116.46	116.5	70 - 130
D 57 d3-MeFOSA	60705	68985			113.6	50 - 150
31 11Cl-PF3OUDS			94.200	93.115	98.8	70 - 130
D 62 d9-EtFOSE	135458	153258			113.1	50 - 150
11 PFDoA			100.00	93.516	93.5	70 - 130
D 38 13C2_PFDoA	798101	791414			99.2	50 - 150
4 10:2 FTS			96.400	78.696	81.6	70 - 130
33 EtFOSE			100.00	102.06	102.1	70 - 130
D 59 d5-EtFOSA	51036	74660			146.3	50 - 150
27 EtFOSA			100.00	75.355	75.4	70 - 130
34 PFDOS			96.800	94.509	97.6	70 - 130
24 PFTrDA			100.00	89.623	89.6	70 - 130
23 PFTeDA			100.00	100.83	100.8	70 - 130
D 42 13C2_PFTeDA	864247	801930			92.8	50 - 150
35 PFHxDA			100.00	98.820	98.8	70 - 130
D 40 13C2_PFHxDA	383301	505031			131.8	50 - 150
36 PFODA			100.00	95.452	95.5	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621005.d
Injection Date: 26-Jul-2021 11:54:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.719	1.719	0	984692	19	>100:1			1000.00	1061.28	98.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.719	1.719	0/0	107965	20	55:1			100.00	107.38		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	0	1013179	16	>100:1			1000.00	1049.73	95.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	0/0	103554	16	>100:1			100.00	102.50		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.140	0	291659	15	>100:1			1000.00	1025.44	98.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.140	0/0	38628	14	>100:1	Target = 3.65		88.400	96.187		
298.9 > 99	44	2.140	2.140		10457	24	74:1	3.69 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.493	2.493	0/0	31949	19	>100:1	Target = 3.30		93.800	107.26		
349 > 99	44	2.485	2.493		7990	16	63:1	3.99 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.415	0	241646	17	>100:1			5000.00	5263.40	114.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.415	2.415	0/0	6038	14	>100:1	Target = 1.50		93.400	70.858		
327 > 81	63	2.415	2.415		4639	8	24:1	1.30 (0.75-2.25)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.459	2.459	0	865478	17	>100:1			1000.00	1022.51	100.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.459	2.459	0/0	98092	17	81:1	Target = 16.42		100.00	118.37		
313 > 119	49	2.459	2.459		5422	16	20:1	18.09 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.579	2.579	0	731246	18	>100:1			5000.00	5148.24	112.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.579	2.579	0/0	26895	18	58:1	Target = 0.77		200.00	229.75		
285 > 185	66	2.587	2.579		30913	18	>100:1	0.87 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.847	2.847	0	942733	17	>100:1			1000.00	1061.85	90.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.847	2.847	0/0	83590	18	>100:1	Target = 3.14		100.00	99.99		
363 > 169	47	2.847	2.847		25958	16	75:1	3.22 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.864	2.864	0	273340	17	>100:1			1000.00	1088.01	104.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.864	2.864	0/0	27159	31	>100:1	Target = 3.31	0.16	91.000	88.689		
399 > 99	45	2.864	2.864		8691	26	52:1	3.12 (1.66-4.98)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.882	2.882	0/0	133371	27	>100:1	Target = 2.54		94.200	93.551		
377 > 85	45	2.891	2.882		50666	20	>100:1	2.63 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.243	3.243	0/0	25088	22	>100:1	Target = 3.57		95.200	94.900		
449 > 99	45	3.243	3.243		7991	25	55:1	3.13 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.205	3.205	0	218574	23	>100:1			5000.00	5894.01	122.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.211	3.211	0/0	14806	22	>100:1	Target = 1.48		94.800	124.25		
427 > 81	64	3.205	3.211		10794	21	68:1	1.37 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.230	3.230	0	884901	22	>100:1			1000.00	1036.07	89.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.237	3.237	0/0	104610	23	86:1	Target = 2.75		100.00	121.27		
413 > 169	53	3.230	3.237		34807	21	>100:1	3.00 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.598	3.598	0	230292	18	>100:1			1000.00	1079.04	101.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.598	3.598	0/0	26536	42	81:1	Target = 3.90	0.22	92.800	86.561		M
499 > 99	54	3.606	3.598		5570	37	55:1	4.76 (1.95-5.85)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.810	3.810	0/0	67892	25	>100:1			93.200	106.32		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.938	3.938	0/0	22672	21	>100:1	Target = 3.46		96.000	113.07		
549 > 99	54	3.930	3.938		7503	16	34:1	3.02 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.233	4.233	0/0	21687	22	81:1	Target = 3.36		96.400	101.52		
599 > 99	54	4.243	4.233		6326	18	48:1	3.42 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.390	4.390	0/0	53224	18	>100:1			94.200	93.115		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.731	4.731	0/0	18757	18	>100:1	Target = 3.51		96.800	94.509		
699 > 99	54	4.737	4.731		6521	21	79:1	2.87 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.606	3.606	0	914153	19	>100:1			1000.00	1032.85	95.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.613	3.613	0/0	83276	17	>100:1	Target = 4.84		100.00	107.36		
463 > 169	56	3.606	3.613		13844	18	71:1	6.01 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.884	3.884	0	447921	18	>100:1			1000.00	1117.21	114.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.884	3.884	0/0	43274	18	82:1	Target = 42.34		100.00	97.747		
498>478	55	3.884	3.884		1486	20	7.9:1	29.12 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.946	3.946	0	181716	17	>100:1			5000.00	6363.52	137.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.954	3.954	0/0	6733	16	39:1	Target = 1.37		95.800	119.62		
527 > 81	65	3.938	3.954		4490	22		1.49 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.529	4.529	0/0	6130	20		Target = 2.23		96.400	78.696		
627 > 80	65	4.537	4.529		3367	21	21:1	1.82 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.946	3.946	0	825008	18	>100:1			1000.00	1147.79	100.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.946	3.946	0/0	70269	18	>100:1	Target = 11.16		100.00	93.838		
513 > 169	51	3.954	3.946		7651	19	39:1	9.18 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.100	4.100	0	1037750	17	>100:1			5000.00	5796.30	120.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.108	4.108	0/0	15369	26	49:1	Target = 1.39	0.21	100.00	100.51		M
570 > 483	58	4.108	4.108		12933	32	64:1	1.18 (0.69-2.09)	0.14				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.252	4.252	0	775811	16	>100:1			1000.00	1153.60	104.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.252	4.252	0/0	61965	16	>100:1	Target = 10.79		100.00	88.909		
563 > 169	52	4.262	4.252		8257	25	65:1	7.50 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.252	4.252	0	934381	15	>100:1			5000.00	5769.80	112.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.262	4.262	1/1	20902	37	>100:1	Target = 1.79		100.00	116.63		M
584 > 526	60	4.271	4.262		11216	28	33:1	1.86 (0.89-2.69)	0.14				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.290	4.290	0	133706	15	>100:1			1000.00	890.97	91.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.308	4.308	0/0	14383	18	53:1			100.00	113.25		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.318	0	68985	19	>100:1			1000.00	1159.84	113.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.327	4.327	0/0	8147	13	26:1	Target = 1.04		100.00	116.46		
512 > 219	57	4.318	4.327		7053	14	44:1	1.15 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.521	4.521	0	791414	16	>100:1			1000.00	1091.46	99.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.521	4.521	0/0	70646	19	51:1	Target = 7.82		100.00	93.516		
613 > 169	38	4.521	4.521		8804	17	85:1	8.02 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.762	4.762	0/0	28249	18	>100:1	Target = 3.35		100.00	89.623		
663 > 169	38	4.762	4.762		10890	24	>100:1	2.59 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.455	4.455	0	153258	16	>100:1			1000.00	1069.03	113.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.472	4.472	0/0	12740	16	54:1			100.00	102.06		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.472	4.472	0	74660	16	>100:1			1000.00	1299.71	146.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.480	4.480	0/0	5907	16	47:1	Target = 1.06		100.00	75.355		
526 > 219	59	4.488	4.480		7752	16	30:1	0.76 (0.53-1.59)					M
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.980	4.980	0	801930	18	>100:1			1000.00	1014.05	92.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.980	4.980	0/0	65743	17	21:1	Target = 9.29		100.00	100.83		
713 > 169	42	4.980	4.980		6623	17	89:1	9.92 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.365	5.365	0	505031	17	>100:1			1000.00	1240.09	131.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.373	5.373	0/0	80241	17	>100:1	Target = 13.38		100.00	98.820		
813 > 269	40	5.365	5.373		6659	16	>100:1	12.05 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.744	5.744	0/0	57257	23	>100:1	Target = 106.35		100.00	95.452		
913 > 319	40	5.751	5.744		443	17	25:1	129.24 (53.17-159.53)					M
*** 37 13C2_PFDA**													
515 > 470		3.946	3.946	0	809369	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.467	2.467	0	875572	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.237	3.237	0	1023721	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.719	1.719	0	972093	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.606	3.606	0	229897	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621006.d
Injection Date: 26-Jul-2021 12:05:12 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	212.53	106.3	70 - 130
D 46 13C4_PFBA	984692	951357			96.6	50 - 150
D 50 13C5_PFPeA	1013179	959980			94.7	50 - 150
21 PFPeA			200.00	205.45	102.7	70 - 130
D 44 13C3_PFBS	291659	279356			95.8	50 - 150
7 PFBS			176.80	186.83	105.7	70 - 130
1 4:2 FTS			186.80	195.36	104.6	70 - 130
D 63 13C2_4:2 FTS_2	241646	214168			88.6	50 - 150
D 49 13C5_PFHxA	865478	903385			104.4	50 - 150
15 PFHxA			200.00	195.69	97.8	70 - 130
22 PFPeS			187.60	170.40	90.8	70 - 130
28 GenX			400.00	447.02	111.8	70 - 130
D 66 13C3_GenX	731246	657488			89.9	50 - 150
D 47 13C4_PFHpA	942733	883789			93.7	50 - 150
13 PFHpA			200.00	201.77	100.9	70 - 130
D 45 13C3_PFHxS	273340	239124			87.5	50 - 150
14 PFHxS			182.00	195.39	107.4	70 - 130
29 ADONA			188.40	203.07	107.8	70 - 130
D 64 13C2_6:2 FTS_2	218574	218943			100.2	50 - 150
2 6:2 FTS			189.60	182.81	96.4	70 - 130
20 PFOA			200.00	196.16	98.1	70 - 130
D 53 13C8_PFOA	884901	905107			102.3	50 - 150
12 PFHpS			190.40	197.12	103.5	70 - 130
18 PFOS			185.60	192.26	103.6	70 - 130
D 54 13C8_PFOS	230292	217247			94.3	50 - 150
17 PFNA			200.00	214.01	107	70 - 130
D 56 13C9_PFNA	914153	823334			90.1	50 - 150
30 9Cl-PF3ONS			186.40	183.27	98.3	70 - 130
D 55 13C8_PFOSA	447921	425221			94.9	50 - 150
19 PFOSA			200.00	211.58	105.8	70 - 130
16 PFNS			192.00	182.82	95.2	70 - 130
D 65 13C2_8:2 FTS_2	181716	191568			105.4	50 - 150
3 8:2 FTS			191.60	190.44	99.4	70 - 130
10 PFDA			200.00	220.13	110.1	70 - 130
D 51 13C6_PFDA	825008	752068			91.2	50 - 150
6 N-MeFOSAA			200.00	199.92	100	70 - 130

Report Date: 27-Jul-2021 15:29:00 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1037750	968149			93.3	50 - 150
9 PFDS			192.80	207.57	107.7	70 - 130
D 52 13C7_PFUdA	775811	719146			92.7	50 - 150
5 N-EtFOSAA			200.00	195.78	97.9	70 - 130
25 PFUdA			200.00	197.81	98.9	70 - 130
D 60 d5-EtFOSAA	934381	967698			103.6	50 - 150
D 61 d7-MeFOSE	133706	142880			106.9	50 - 150
32 MeFOSE			200.00	199.89	99.9	70 - 130
26 MeFOSA			200.00	223.51	111.8	70 - 130
D 57 d3-MeFOSA	68985	61775			89.5	50 - 150
31 11Cl-PF3OUDS			188.40	194.80	103.4	70 - 130
D 62 d9-EtFOSE	153258	156133			101.9	50 - 150
11 PFDoA			200.00	211.60	105.8	70 - 130
D 38 13C2_PFDoA	791414	740005			93.5	50 - 150
4 10:2 FTS			192.80	181.42	94.1	70 - 130
33 EtFOSE			200.00	181.64	90.8	70 - 130
D 59 d5-EtFOSA	74660	65009			87.1	50 - 150
27 EtFOSA			200.00	186.62	93.3	70 - 130
34 PFDOS			193.60	210.33	108.6	70 - 130
24 PFTrDA			200.00	207.55	103.8	70 - 130
23 PFTeDA			200.00	212.61	106.3	70 - 130
D 42 13C2_PFTeDA	801930	757497			94.5	50 - 150
35 PFHxDA			200.00	188.76	94.4	70 - 130
D 40 13C2_PFHxDA	505031	468086			92.7	50 - 150
36 PFODA			200.00	186.66	93.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621006.d
Injection Date: 26-Jul-2021 12:05:12 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.719	1.719	0	951357	19	>100:1			1000.00	1025.36	96.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.719	1.719	0/0	206455	18	>100:1			200.00	212.53		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	0	959980	15	>100:1			1000.00	994.61	94.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	0/0	196658	15	>100:1			200.00	205.45		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.140	1	279356	15	>100:1			1000.00	982.18	95.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.140	1/0	71863	18	>100:1	Target = 3.65		176.80	186.83		
298.9 > 99	44	2.140	2.140		19415	13	>100:1	3.70 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.493	2.493	1/0	48614	19	>100:1	Target = 3.30		187.60	170.40		
349 > 99	44	2.493	2.493		14862	18	>100:1	3.27 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.415	1	214168	18	>100:1			5000.00	4664.89	88.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.424	2.415	1/0	14754	15		Target = 1.50		186.80	195.36		
327 > 81	63	2.424	2.415		11712	28	34:1	1.25 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.459	2.459	1	903385	17	>100:1			1000.00	1067.30	104.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.459	2.459	1/0	169269	16	>100:1	Target = 16.42		200.00	195.69		M
313 > 119	49	2.459	2.459		10942	14	65:1	15.46 (8.21-24.64)					M
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.579	2.579	1	657488	19	>100:1			5000.00	4628.95	89.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.579	2.579	1/0	47051	18	>100:1	Target = 0.77		400.00	447.02		
285 > 185	66	2.579	2.579		55383	17	>100:1	0.84 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.847	2.847	0	883789	18	>100:1			1000.00	995.46	93.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.847	2.847	0/0	158126	16	>100:1	Target = 3.14		200.00	201.77		
363 > 169	47	2.847	2.847		46946	17	>100:1	3.36 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.864	2.864	0	239124	18	>100:1			1000.00	951.81	87.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.855	2.864	0/0	52344	26	>100:1	Target = 3.31	0.19	182.00	195.39		
399 > 99	45	2.855	2.864		14156	26	>100:1	3.69 (1.66-4.98)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.891	2.882	1/1	253266	17	>100:1	Target = 2.54		188.40	203.07		
377 > 85	45	2.891	2.882		100867	20	>100:1	2.51 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.236	3.243	0/0	45589	22	>100:1	Target = 3.57		190.40	197.12		
449 > 99	45	3.243	3.243		12418	20	78:1	3.67 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.204	3.205	0	218943	24	>100:1			5000.00	5903.96	100.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.211	3.211	0/0	19648	21	>100:1	Target = 1.48		189.60	182.81		
427 > 81	64	3.211	3.211		13879	20	>100:1	1.41 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.230	3.230	0	905107	22	>100:1			1000.00	1059.73	102.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.236	3.237	0/0	173080	22	>100:1	Target = 2.75		200.00	196.16		
413 > 169	53	3.230	3.237		66356	20	>100:1	2.60 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.605	3.598	1	217247	19	>100:1			1000.00	1017.92	94.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.605	3.598	1/0	49514	37		Target = 3.90	0.43	185.60	192.26		M
499 > 99	54	3.597	3.598		11545	32	48:1	4.28 (1.95-5.85)	0.14				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.799	3.810	0/-1	110399	18	>100:1			186.40	183.27		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.934	3.938	0/-1	34581	18	>100:1	Target = 3.46		192.00	182.82		
549 > 99	54	3.934	3.938		11389	20	53:1	3.03 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.228	4.233	0/-1	41829	14	>100:1	Target = 3.36		192.80	207.57		
599 > 99	54	4.228	4.233		13927	16	75:1	3.00 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.385	4.390	0/-1	105042	18	>100:1			188.40	194.80		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.729	4.731	0/-1	39379	26	>100:1	Target = 3.51		193.60	210.33		
699 > 99	54	4.729	4.731		9870	16	>100:1	3.98 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.612	3.606	1	823334	19	>100:1			1000.00	930.24	90.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.605	3.613	0/-1	149510	18	>100:1	Target = 4.84		200.00	214.01		
463 > 169	56	3.597	3.613		33582	19	>100:1	4.45 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.889	3.884	1	425221	19	>100:1			1000.00	1060.59	94.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.889	3.884	1/0	88922	20	>100:1	Target = 42.34		200.00	211.58		
498>478	55	3.889	3.884		2164	17	17:1	41.09 (21.17-63.51)					M
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.934	3.946	0	191568	18	>100:1			5000.00	6708.53	105.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.950	3.954	0/0	11301	16	40:1	Target = 1.37		191.60	190.44		M
527 > 81	65	3.934	3.954		7784	15		1.45 (0.68-2.05)					M
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.533	4.529	1/1	14898	22	>100:1	Target = 2.23		192.80	181.42		
627 > 80	65	4.533	4.529		6251	21	46:1	2.38 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.950	3.946	1	752068	17	>100:1			1000.00	1046.31	91.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.950	3.946	1/0	150268	18	>100:1	Target = 11.16		200.00	220.13		
513 > 169	51	3.950	3.946		16334	18	72:1	9.19 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.103	4.100	1	968149	18	>100:1			5000.00	5407.54	93.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.103	4.108	0/-1	28520	30	>100:1	Target = 1.39	0.15	200.00	199.92		M
570 > 483	58	4.103	4.108		18467	37	>100:1	1.54 (0.69-2.09)	0.21				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.252	1	719146	15	>100:1			1000.00	1069.34	92.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.257	4.252	1/0	127791	16	>100:1	Target = 10.79		200.00	197.81		
563 > 169	52	4.247	4.252		12957	21	41:1	9.86 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.247	4.252	0	967698	17	>100:1			5000.00	5975.54	103.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.266	4.262	1/1	36340	30	>100:1	Target = 1.79	0.06	200.00	195.78		M
584 > 526	60	4.257	4.262		19019	28		1.91 (0.89-2.69)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.303	4.290	1	142880	14	>100:1			1000.00	952.10	106.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.313	4.308	1/0	27129	14	52:1			200.00	199.89		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.322	4.318	1	61775	16	>100:1			1000.00	1038.62	89.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.322	4.327	0/-1	14002	20	56:1	Target = 1.04		200.00	223.51		
512 > 219	57	4.331	4.327		12513	15	83:1	1.11 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.517	4.521	0	740005	17	>100:1			1000.00	1020.56	93.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.525	4.521	1/1	149470	17	90:1	Target = 7.82		200.00	211.60		
613 > 169	38	4.517	4.521		17013	23	>100:1	8.78 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.759	4.762	0/0	61170	18	>100:1	Target = 3.35		200.00	207.55		
663 > 169	38	4.759	4.762		20052	19	>100:1	3.05 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.460	4.455	1	156133	18	>100:1			1000.00	1089.09	101.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.476	4.472	1/0	23099	16	85:1			200.00	181.64		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.484	4.472	1	65009	16	>100:1			1000.00	1131.71	87.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.492	4.480	1/0	12738	15	66:1	Target = 1.06		200.00	186.62		
526 > 219	59	4.484	4.480		10806	19	52:1	1.17 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.975	4.980	0	757497	17	>100:1			1000.00	957.87	94.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.975	4.980	0/0	130948	17	23:1	Target = 9.29		200.00	212.61		
713 > 169	42	4.975	4.980		13289	19	>100:1	9.85 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.361	5.365	0	468086	18	>100:1			1000.00	1149.37	92.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.370	5.373	0/0	142061	17	15:1	Target = 13.38		200.00	188.76		
813 > 269	40	5.361	5.373		10666	17	>100:1	13.31 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.742	5.744	0/0	103776	22	11:1	Target = 106.35		200.00	186.66		
913 > 319	40	5.734	5.744		1054	18	46:1	98.45 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.950	3.946	1	731394	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.467	0	794481	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.230	3.237	0	917348	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.719	1.719	0	904906	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.605	3.606	0	229255	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621019.d
Injection Date: 26-Jul-2021 14:22:47 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 11
Sample Info: CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	919.98	92	70 - 130
D 46 13C4_PFBA	984692	1025760			104.2	50 - 150
D 50 13C5_PFPeA	1013179	1015649			100.2	50 - 150
21 PFPeA			1000.00	954.85	95.5	70 - 130
D 44 13C3_PFBS	291659	306768			105.2	50 - 150
7 PFBS			884.00	822.94	93.1	70 - 130
1 4:2 FTS			934.00	879.61	94.2	70 - 130
D 63 13C2_4:2 FTS_2	241646	302687			125.3	50 - 150
D 49 13C5_PFHxA	865478	890503			102.9	50 - 150
15 PFHxA			1000.00	931.73	93.2	70 - 130
22 PFPeS			938.00	856.96	91.4	70 - 130
28 GenX			2000.00	1928.29	96.4	70 - 130
D 66 13C3_GenX	731246	719068			98.3	50 - 150
D 47 13C4_PFHpA	942733	1022920			108.5	50 - 150
13 PFHpA			1000.00	882.90	88.3	70 - 130
D 45 13C3_PFHxS	273340	287354			105.1	50 - 150
14 PFHxS			910.00	770.24	84.6	70 - 130
29 ADONA			942.00	867.24	92.1	70 - 130
D 64 13C2_6:2 FTS_2	218574	271903			124.4	50 - 150
2 6:2 FTS			948.00	1015.64	107.1	70 - 130
20 PFOA			1000.00	892.73	89.3	70 - 130
D 53 13C8_PFOA	884901	1001029			113.1	50 - 150
12 PFHpS			952.00	798.44	83.9	70 - 130
18 PFOS			928.00	857.07	92.4	70 - 130
D 54 13C8_PFOS	230292	225080			97.7	50 - 150
17 PFNA			1000.00	819.88	82	70 - 130
D 56 13C9_PFNA	914153	1075005			117.6	50 - 150
30 9Cl-PF3ONS			932.00	905.50	97.2	70 - 130
D 55 13C8_PFOSA	447921	433126			96.7	50 - 150
19 PFOSA			1000.00	983.95	98.4	70 - 130
16 PFNS			960.00	976.86	101.8	70 - 130
D 65 13C2_8:2 FTS_2	181716	171904			94.6	50 - 150
3 8:2 FTS			958.00	1060.59	110.7	70 - 130
10 PFDA			1000.00	872.71	87.3	70 - 130
D 51 13C6_PFDA	825008	847763			102.8	50 - 150
6 N-MeFOSAA			1000.00	1148.81	114.9	70 - 130

Report Date: 27-Jul-2021 15:29:03 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621019.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1037750	958700			92.4	50 - 150
9 PFDS			964.00	958.91	99.5	70 - 130
D 52 13C7_PFUdA	775811	800038			103.1	50 - 150
5 N-EtFOSAA			1000.00	1020.89	102.1	70 - 130
25 PFUdA			1000.00	895.23	89.5	70 - 130
D 60 d5-EtFOSAA	934381	861148			92.2	50 - 150
D 61 d7-MeFOSE	133706	146384			109.5	50 - 150
32 MeFOSE			1000.00	970.99	97.1	70 - 130
26 MeFOSA			1000.00	1098.31	109.8	70 - 130
D 57 d3-MeFOSA	68985	56468			81.9	50 - 150
31 11Cl-PF3OUDS			942.00	879.32	93.3	70 - 130
D 62 d9-EtFOSE	153258	140355			91.6	50 - 150
11 PFDoA			1000.00	907.77	90.8	70 - 130
D 38 13C2_PFDoA	791414	794274			100.4	50 - 150
4 10:2 FTS			964.00	1018.62	105.7	70 - 130
33 EtFOSE			1000.00	981.53	98.2	70 - 130
D 59 d5-EtFOSA	74660	53978			72.3	50 - 150
27 EtFOSA			1000.00	946.25	94.6	70 - 130
34 PFDOS			968.00	881.53	91.1	70 - 130
24 PFTrDA			1000.00	917.31	91.7	70 - 130
23 PFTeDA			1000.00	872.26	87.2	70 - 130
D 42 13C2_PFTeDA	801930	843798			105.2	50 - 150
35 PFHxDA			1000.00	963.14	96.3	70 - 130
D 40 13C2_PFHxDA	505031	444500			88	50 - 150
36 PFODA			1000.00	981.24	98.1	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621019.d
Injection Date: 26-Jul-2021 14:22:47 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 11
Sample Info: CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.713	1.719	1	1025760	19	>100:1			1000.00	1105.55	104.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.713	1.719	1/0	963567	19	>100:1			1000.00	919.98		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.078	2.088	1	1015649	16	>100:1			1000.00	1052.29	100.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.078	2.088	1/0	966992	15	>100:1			1000.00	954.85		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.140	1	306768	15	>100:1			1000.00	1078.56	105.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.140	1/0	347610	15	>100:1	Target = 3.65		884.00	822.94		
298.9 > 99	44	2.130	2.140		87571	17	>100:1	3.96 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.485	2.493	1/0	268479	18	>100:1	Target = 3.30		938.00	856.96		
349 > 99	44	2.485	2.493		84876	18	>100:1	3.16 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.415	0	302687	18	>100:1			5000.00	6592.96	125.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.415	2.415	2/2	93888	18	>100:1	Target = 1.50		934.00	879.61		
327 > 81	63	2.407	2.415		74525	20	>100:1	1.25 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.459	1	890503	17	>100:1			1000.00	1052.08	102.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.459	1/0	794458	18	>100:1	Target = 16.42		1000.00	931.73		
313 > 119	49	2.459	2.459		45437	17	>100:1	17.48 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.572	2.579	1	719068	19	>100:1			5000.00	5062.50	98.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.572	2.579	1/0	221973	18	>100:1	Target = 0.77		2000.00	1928.29		
285 > 185	66	2.572	2.579		283502	18	>100:1	0.78 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.838	2.847	1	1022920	18	>100:1			1000.00	1152.17	108.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.838	2.847	1/0	800844	17	>100:1	Target = 3.14		1000.00	882.90		
363 > 169	47	2.838	2.847		258120	18	>100:1	3.10 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.847	2.864	1	287354	18	>100:1			1000.00	1143.79	105.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.847	2.864	1/0	247961	26	>100:1	Target = 3.31	0.19	910.00	770.24		
399 > 99	45	2.855	2.864		72585	25	>100:1	3.41 (1.66-4.98)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.882	1/0	1299776	18	>100:1	Target = 2.54		942.00	867.24		
377 > 85	45	2.873	2.882		506571	18	>100:1	2.56 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.217	3.243	1/0	221899	23	>100:1	Target = 3.57		952.00	798.44		
449 > 99	45	3.230	3.243		65644	29	>100:1	3.38 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.192	3.205	1	271903	24	>100:1			5000.00	7332.06	124.4	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.198	3.211	2/1	109470	23	>100:1	Target = 1.48		948.00	1015.64		
427 > 81	64	3.198	3.211		66688	28	>100:1	1.64 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.224	3.230	1	1001029	21	>100:1			1000.00	1172.04	113.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.217	3.237	1/0	871168	22	>100:1	Target = 2.75		1000.00	892.73		
413 > 169	53	3.230	3.237		294894	23	>100:1	2.95 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.590	3.598	1	225080	19	>100:1			1000.00	1054.62	97.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.590	3.598	1/0	210832	36	>100:1	Target = 3.90	0.27	928.00	857.07		
499 > 99	54	3.590	3.598		47005	32	78:1	4.48 (1.95-5.85)	0.14				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.792	3.810	1/0	565138	19	>100:1			932.00	905.50		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.926	3.938	1/0	191436	17	>100:1	Target = 3.46		960.00	976.86		
549 > 99	54	3.926	3.938		51762	17	>100:1	3.69 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.219	4.233	1/0	200203	17	>100:1	Target = 3.36		964.00	958.91		
599 > 99	54	4.219	4.233		59132	16	>100:1	3.38 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.376	4.390	2/1	491240	15	>100:1			942.00	879.32		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.715	4.731	1/0	170996	18	>100:1	Target = 3.51		968.00	881.53		
699 > 99	54	4.715	4.731		52373	17	>100:1	3.26 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.590	3.606	1	1075005	19	>100:1			1000.00	1214.58	117.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.597	3.613	1/0	747862	20	>100:1	Target = 4.84		1000.00	819.88		
463 > 169	56	3.590	3.613		139677	19	>100:1	5.35 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.881	3.884	1	433126	19	>100:1			1000.00	1080.30	96.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.881	3.884	0/-1	421222	19	>100:1	Target = 42.34		1000.00	983.95		
498>478	55	3.881	3.884		10017	22		42.05 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.926	3.946	1	171904	18	>100:1			5000.00	6019.92	94.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.926	3.954	1/0	56476	19	>100:1	Target = 1.37		958.00	1060.59		
527 > 81	65	3.926	3.954		35910	23	>100:1	1.57 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.515	4.529	1/0	75061	21	>100:1	Target = 2.23		964.00	1018.62		
627 > 80	65	4.515	4.529		27750	16	>100:1	2.70 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.946	1	847763	18	>100:1			1000.00	1179.44	102.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.934	3.946	1/0	671534	18	>100:1	Target = 11.16		1000.00	872.71		
513 > 169	51	3.934	3.946		63458	19	>100:1	10.58 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.087	4.100	1	958700	18	>100:1			5000.00	5354.77	92.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.087	4.108	-1/-2	162285	32	>100:1	Target = 1.39	0.07	1000.00	1148.81		M
570 > 483	58	4.087	4.108		104598	32	>100:1	1.55 (0.69-2.09)	0.17				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.237	4.252	1	800038	16	>100:1			1000.00	1189.62	103.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.237	4.252	1/0	643411	16	>100:1	Target = 10.79		1000.00	895.23		
563 > 169	52	4.237	4.252		62501	16	>100:1	10.29 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.237	4.252	1	861148	18	>100:1			5000.00	5317.59	92.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.247	4.262	0/-1	168626	33	>100:1	Target = 1.79	0.07	1000.00	1020.89		M
584 > 526	60	4.247	4.262		94107	31	>100:1	1.79 (0.89-2.69)	0.20				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.293	4.290	0	146384	16	>100:1			1000.00	975.45	109.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.303	4.308	1/1	135014	15	>100:1			1000.00	970.99		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.321	4.318	1	56468	16	>100:1			1000.00	949.39	81.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.321	4.327	1/0	62893	14	81:1	Target = 1.04		1000.00	1098.31		
512 > 219	57	4.321	4.327		59678	14	>100:1	1.05 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.507	4.521	2	794274	16	>100:1			1000.00	1095.40	100.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.507	4.521	2/0	688250	17	>100:1	Target = 7.82		1000.00	907.77		
613 > 169	38	4.507	4.521		91028	19	>100:1	7.56 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.746	4.762	2/0	290179	19	>100:1	Target = 3.35		1000.00	917.31		
663 > 169	38	4.740	4.762		84993	22	>100:1	3.41 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.458	4.455	1	140355	17	>100:1			1000.00	979.03	91.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.474	4.472	1/0	112203	15	>100:1			1000.00	981.53		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.482	4.472	1	53978	15	>100:1			1000.00	939.67	72.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.482	4.480	0/-1	53628	16	>100:1	Target = 1.06		1000.00	946.25		
526 > 219	59	4.490	4.480		52257	20	>100:1	1.02 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.959	4.980	2	843798	16	>100:1			1000.00	1066.99	105.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.959	4.980	1/-1	598448	16	81:1	Target = 9.29		1000.00	872.26		
713 > 169	42	4.959	4.980		67687	18	>100:1	8.84 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.343	5.365	2	444500	17	>100:1			1000.00	1091.46	88	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.343	5.373	2/0	688328	17	64:1	Target = 13.38		1000.00	963.14		
813 > 269	40	5.343	5.373		51465	17	>100:1	13.37 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.712	5.744	3/1	518047	21	56:1	Target = 106.35		1000.00	981.24		
913 > 319	40	5.712	5.744		5291	26	95:1	97.91 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.934	3.946	1	747754	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.467	1	780533	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.217	3.237	1	892626	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.713	1.719	1	935946	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.590	3.606	1	223366	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621032.d
Injection Date: 26-Jul-2021 16:40:13 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 24
Sample Info: CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	889.38	88.9	70 - 130
D 46 13C4_PFBA	984692	1062934			107.9	50 - 150
D 50 13C5_PFPeA	1013179	1069753			105.6	50 - 150
21 PFPeA			1000.00	899.16	89.9	70 - 130
D 44 13C3_PFBS	291659	310108			106.3	50 - 150
7 PFBS			884.00	821.52	92.9	70 - 130
1 4:2 FTS			934.00	822.87	88.1	70 - 130
D 63 13C2_4:2 FTS_2	241646	276561			114.4	50 - 150
D 49 13C5_PFHxA	865478	981736			113.4	50 - 150
15 PFHxA			1000.00	904.93	90.5	70 - 130
22 PFPeS			938.00	891.63	95.1	70 - 130
28 GenX			2000.00	2234.66	111.7	70 - 130
D 66 13C3_GenX	731246	684910			93.7	50 - 150
D 47 13C4_PFHpA	942733	956842			101.5	50 - 150
13 PFHpA			1000.00	951.48	95.1	70 - 130
D 45 13C3_PFHxS	273340	278414			101.9	50 - 150
14 PFHxS			910.00	790.50	86.9	70 - 130
29 ADONA			942.00	841.34	89.3	70 - 130
D 64 13C2_6:2 FTS_2	218574	208068			95.2	50 - 150
2 6:2 FTS			948.00	1028.02	108.4	70 - 130
20 PFOA			1000.00	883.03	88.3	70 - 130
D 53 13C8_PFOA	884901	984701			111.3	50 - 150
12 PFHpS			952.00	879.71	92.4	70 - 130
18 PFOS			928.00	892.11	96.1	70 - 130
D 54 13C8_PFOS	230292	235760			102.4	50 - 150
17 PFNA			1000.00	878.77	87.9	70 - 130
D 56 13C9_PFNA	914153	1014615			111	50 - 150
30 9Cl-PF3ONS			932.00	875.82	94	70 - 130
D 55 13C8_PFOSA	447921	387291			86.5	50 - 150
19 PFOSA			1000.00	1122.27	112.2	70 - 130
16 PFNS			960.00	854.77	89	70 - 130
D 65 13C2_8:2 FTS_2	181716	158859			87.4	50 - 150
3 8:2 FTS			958.00	1380.63	144.1	70 - 130
10 PFDA			1000.00	733.97	73.4	70 - 130
D 51 13C6_PFDA	825008	975461			118.2	50 - 150
6 N-MeFOSAA			1000.00	1054.54	105.5	70 - 130

Report Date: 27-Jul-2021 15:29:17 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621032.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1037750	918129			88.5	50 - 150
9 PFDS			964.00	858.65	89.1	70 - 130
D 52 13C7_PFUdA	775811	843744			108.8	50 - 150
5 N-EtFOSAA			1000.00	1009.03	100.9	70 - 130
25 PFUdA			1000.00	791.23	79.1	70 - 130
D 60 d5-EtFOSAA	934381	932966			99.8	50 - 150
D 61 d7-MeFOSE	133706	152698			114.2	50 - 150
32 MeFOSE			1000.00	969.97	97	70 - 130
26 MeFOSA			1000.00	1008.61	100.9	70 - 130
D 57 d3-MeFOSA	68985	66920			97	50 - 150
31 11Cl-PF3OUDS			942.00	833.64	88.5	70 - 130
D 62 d9-EtFOSE	153258	161443			105.3	50 - 150
11 PFDoA			1000.00	838.85	83.9	70 - 130
D 38 13C2_PFDoA	791414	851296			107.6	50 - 150
4 10:2 FTS			964.00	896.72	93	70 - 130
33 EtFOSE			1000.00	827.07	82.7	70 - 130
D 59 d5-EtFOSA	74660	61645			82.6	50 - 150
27 EtFOSA			1000.00	948.92	94.9	70 - 130
34 PFDOS			968.00	903.38	93.3	70 - 130
24 PFTrDA			1000.00	804.16	80.4	70 - 130
23 PFTeDA			1000.00	982.41	98.2	70 - 130
D 42 13C2_PFTeDA	801930	736517			91.8	50 - 150
35 PFHxDA			1000.00	961.96	96.2	70 - 130
D 40 13C2_PFHxDA	505031	450624			89.2	50 - 150
36 PFODA			1000.00	1047.33	104.7	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072621-DOD.b\072621032.d		
Injection Date:	26-Jul-2021 16:40:13	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	24
Sample Info:	CCV 1000A_SVLC-1573	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.713	1.719	0	1062934	19	>100:1			1000.00	1145.61	107.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.719	1.719	1/1	965273	20	>100:1			1000.00	889.38		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.088	0	1069753	15	>100:1			1000.00	1108.34	105.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.088	0/0	959097	15	>100:1			1000.00	899.16		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.140	0	310108	15	>100:1			1000.00	1090.30	106.3	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.129	2.140	0/0	350787	15	>100:1	Target = 3.65		884.00	821.52		
298.9 > 99	44	2.140	2.140		96827	16	>100:1	3.62 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.484	2.493	0/0	282382	20	>100:1	Target = 3.30		938.00	891.63		
349 > 99	44	2.484	2.493		86088	17	>100:1	3.28 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.414	2.415	1	276561	17	>100:1			5000.00	6023.90	114.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.414	2.415	0/-1	80250	19	>100:1	Target = 1.50		934.00	822.87		
327 > 81	63	2.414	2.415		54465	20	>100:1	1.47 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.449	2.459	0	981736	17	>100:1			1000.00	1159.86	113.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.449	2.459	0/0	850654	17	>100:1	Target = 16.42		1000.00	904.93		
313 > 119	49	2.449	2.459		47089	18	>100:1	18.06 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.571	2.579	0	684910	18	>100:1			5000.00	4822.01	93.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.571	2.579	0/0	245020	19	>100:1	Target = 0.77		2000.00	2234.66		
285 > 185	66	2.571	2.579		273062	19	>100:1	0.89 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.847	0	956842	18	>100:1			1000.00	1077.75	101.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.847	0/0	807297	17	>100:1	Target = 3.14		1000.00	951.48		
363 > 169	47	2.836	2.847		246424	17	>100:1	3.27 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.854	2.864	1	278414	17	>100:1			1000.00	1108.20	101.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.854	2.864	1/0	246565	26	>100:1	Target = 3.31	0.18	910.00	790.50		
399 > 99	45	2.845	2.864		77732	25	>100:1	3.17 (1.66-4.98)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.880	2.882	1/0	1221723	18	>100:1	Target = 2.54		942.00	841.34		
377 > 85	45	2.871	2.882		517581	18	>100:1	2.36 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.221	3.243	1/0	236878	22	>100:1	Target = 3.57		952.00	879.71		
449 > 99	45	3.221	3.243		69054	20	>100:1	3.43 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.196	3.205	1	208068	21	>100:1			5000.00	5610.70	95.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.202	3.211	1/0	84737	21	>100:1	Target = 1.48		948.00	1028.02		
427 > 81	64	3.190	3.211		53414	22	>100:1	1.58 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.215	3.230	0	984701	22	>100:1			1000.00	1152.92	111.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.221	3.237	1/1	847644	22	>100:1	Target = 2.75		1000.00	883.03		
413 > 169	53	3.221	3.237		301401	22	>100:1	2.81 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.587	3.598	0	235760	19	>100:1			1000.00	1104.66	102.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.587	3.598	0/0	229643	37	>100:1	Target = 3.90	0.23	928.00	892.11		
499 > 99	54	3.587	3.598		57165	35	>100:1	4.01 (1.95-5.85)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.789	3.810	0/0	572555	19	>100:1			932.00	875.82		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.923	3.938	0/0	175459	17	>100:1	Target = 3.46		960.00	854.77		
549 > 99	54	3.916	3.938		50751	16	>100:1	3.45 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.217	4.233	0/0	187777	16	>100:1	Target = 3.36		964.00	858.65		
599 > 99	54	4.217	4.233		68835	16	>100:1	2.72 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.374	4.390	0/0	487818	16	>100:1			942.00	833.64		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.715	4.731	0/0	183549	20	>100:1	Target = 3.51		968.00	903.38		
699 > 99	54	4.715	4.731		55882	20	>100:1	3.28 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.594	3.606	1	1014615	19	>100:1			1000.00	1146.35	111	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.594	3.613	0/-1	756550	20	>100:1	Target = 4.84		1000.00	878.77		
463 > 169	56	3.594	3.613		159488	19	>100:1	4.74 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.884	0	387291	18	>100:1			1000.00	965.98	86.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.878	3.884	0/0	429595	18	>100:1	Target = 42.34		1000.00	1122.27		
498>478	55	3.878	3.884		10355	21	88:1	41.48 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.916	3.946	0	158859	18	>100:1			5000.00	5563.09	87.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.923	3.954	0/0	67939	21	>100:1	Target = 1.37		958.00	1380.63		
527 > 81	65	3.931	3.954		32664	20		2.07 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.514	4.529	0/0	61064	16	>100:1	Target = 2.23		964.00	896.72		
627 > 80	65	4.514	4.529		27095	24	86:1	2.25 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.923	3.946	0	975461	18	>100:1			1000.00	1357.10	118.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.931	3.946	0/0	649849	19	>100:1	Target = 11.16		1000.00	733.97		
513 > 169	51	3.931	3.946		67253	21	>100:1	9.66 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.085	4.100	0	918129	17	>100:1			5000.00	5128.16	88.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.094	4.108	0/0	142663	31	>100:1	Target = 1.39		1000.00	1054.54		M
570 > 483	58	4.085	4.108		100645	30	>100:1	1.41 (0.69-2.09)	0.20				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.235	4.252	0	843744	17	>100:1			1000.00	1254.61	108.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.235	4.252	0/0	599736	16	>100:1	Target = 10.79		1000.00	791.23		
563 > 169	52	4.235	4.252		64664	17	>100:1	9.27 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.235	4.252	0	932966	16	>100:1			5000.00	5761.07	99.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.245	4.262	-1/-1	180567	35	>100:1	Target = 1.79		1000.00	1009.03		M
584 > 526	60	4.245	4.262		96038	31	>100:1	1.88 (0.89-2.69)	0.08				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.301	4.290	1	152698	15	>100:1			1000.00	1017.52	114.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.310	4.308	1/0	140690	15	>100:1			1000.00	969.97		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.320	4.318	0	66920	13	>100:1			1000.00	1125.12	97	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.320	4.327	0/0	68447	19	91:1	Target = 1.04		1000.00	1008.61		
512 > 219	57	4.320	4.327		62755	15	>100:1	1.09 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.506	4.521	0	851296	17	>100:1			1000.00	1174.04	107.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.506	4.521	0/0	681655	17	>100:1	Target = 7.82		1000.00	838.85		
613 > 169	38	4.506	4.521		78498	17	>100:1	8.68 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.739	4.762	0/0	272648	19	>100:1	Target = 3.35		1000.00	804.16		
663 > 169	38	4.739	4.762		89008	32	>100:1	3.06 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.457	4.455	0	161443	21	>100:1			1000.00	1126.13	105.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.473	4.472	0/0	108752	16	>100:1			1000.00	827.07		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.472	0	61645	16	>100:1			1000.00	1073.14	82.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.490	4.480	1/1	61418	16	>100:1	Target = 1.06		1000.00	948.92		
526 > 219	59	4.490	4.480		59721	16	>100:1	1.02 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.958	4.980	0	736517	17	>100:1			1000.00	931.34	91.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.958	4.980	0/0	588325	16	72:1	Target = 9.29		1000.00	982.41		
713 > 169	42	4.958	4.980		62143	16	>100:1	9.46 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.340	5.365	0	450624	16	>100:1			1000.00	1106.50	89.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.340	5.373	0/0	696951	18	61:1	Target = 13.38		1000.00	961.96		
813 > 269	40	5.340	5.373		51475	19	>100:1	13.53 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.709	5.744	0/0	560559	22	61:1	Target = 106.35		1000.00	1047.33		
913 > 319	40	5.709	5.744		5905	28	>100:1	94.92 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.931	3.946	0	792430	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.449	2.467	0	870426	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.215	3.237	0	933427	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.713	1.719	0	971934	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.587	3.606	0	241826	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621042.d
Injection Date: 26-Jul-2021 18:26:20 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 33
Sample Info: CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	917.43	91.7	70 - 130
D 46 13C4_PFBA	984692	999433			101.5	50 - 150
D 50 13C5_PFPeA	1013179	1030303			101.7	50 - 150
21 PFPeA			1000.00	888.56	88.9	70 - 130
D 44 13C3_PFBS	291659	284377			97.5	50 - 150
7 PFBS			884.00	820.34	92.8	70 - 130
1 4:2 FTS			934.00	1028.25	110.1	70 - 130
D 63 13C2_4:2 FTS_2	241646	224894			93.1	50 - 150
D 49 13C5_PFHxA	865478	916367			105.9	50 - 150
15 PFHxA			1000.00	892.38	89.2	70 - 130
22 PFPeS			938.00	863.66	92.1	70 - 130
28 GenX			2000.00	2264.51	113.2	70 - 130
D 66 13C3_GenX	731246	629007			86	50 - 150
D 47 13C4_PFHpA	942733	911800			96.7	50 - 150
13 PFHpA			1000.00	977.25	97.7	70 - 130
D 45 13C3_PFHxS	273340	264300			96.7	50 - 150
14 PFHxS			910.00	815.37	89.6	70 - 130
29 ADONA			942.00	818.92	86.9	70 - 130
D 64 13C2_6:2 FTS_2	218574	208864			95.6	50 - 150
2 6:2 FTS			948.00	978.61	103.2	70 - 130
20 PFOA			1000.00	961.35	96.1	70 - 130
D 53 13C8_PFOA	884901	913728			103.3	50 - 150
12 PFHpS			952.00	894.25	93.9	70 - 130
18 PFOS			928.00	858.50	92.5	70 - 130
D 54 13C8_PFOS	230292	224820			97.6	50 - 150
17 PFNA			1000.00	914.62	91.5	70 - 130
D 56 13C9_PFNA	914153	1004264			109.9	50 - 150
30 9Cl-PF3ONS			932.00	898.01	96.4	70 - 130
D 55 13C8_PFOSA	447921	409255			91.4	50 - 150
19 PFOSA			1000.00	1054.71	105.5	70 - 130
16 PFNS			960.00	927.37	96.6	70 - 130
D 65 13C2_8:2 FTS_2	181716	178582			98.3	50 - 150
3 8:2 FTS			958.00	1008.48	105.3	70 - 130
10 PFDA			1000.00	935.99	93.6	70 - 130
D 51 13C6_PFDA	825008	819784			99.4	50 - 150
6 N-MeFOSAA			1000.00	1109.89	111	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1037750	935910			90.2	50 - 150
9 PFDS			964.00	884.68	91.8	70 - 130
D 52 13C7_PFUdA	775811	871916			112.4	50 - 150
5 N-EtFOSAA			1000.00	1017.66	101.8	70 - 130
25 PFUdA			1000.00	855.47	85.5	70 - 130
D 60 d5-EtFOSAA	934381	870147			93.1	50 - 150
D 61 d7-MeFOSE	133706	146339			109.4	50 - 150
32 MeFOSE			1000.00	1054.43	105.4	70 - 130
26 MeFOSA			1000.00	944.62	94.5	70 - 130
D 57 d3-MeFOSA	68985	62363			90.4	50 - 150
31 11Cl-PF3OUDS			942.00	896.34	95.2	70 - 130
D 62 d9-EtFOSE	153258	146212			95.4	50 - 150
11 PFDoA			1000.00	867.52	86.8	70 - 130
D 38 13C2_PFDoA	791414	786044			99.3	50 - 150
4 10:2 FTS			964.00	778.15	80.7	70 - 130
33 EtFOSE			1000.00	948.95	94.9	70 - 130
D 59 d5-EtFOSA	74660	54552			73.1	50 - 150
27 EtFOSA			1000.00	990.73	99.1	70 - 130
34 PFDOS			968.00	946.22	97.7	70 - 130
24 PFTrDA			1000.00	884.17	88.4	70 - 130
23 PFTeDA			1000.00	843.87	84.4	70 - 130
D 42 13C2_PFTeDA	801930	824879			102.9	50 - 150
35 PFHxDA			1000.00	954.53	95.5	70 - 130
D 40 13C2_PFHxDA	505031	419359			83	50 - 150
36 PFODA			1000.00	997.12	99.7	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621042.d
Injection Date: 26-Jul-2021 18:26:20 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 33
Sample Info: CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.713	1.719	0	999433	19	>100:1			1000.00	1077.17	101.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.713	1.719	0/0	936231	20	>100:1			1000.00	917.43		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.088	0	1030303	17	>100:1			1000.00	1067.47	101.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.088	0/0	912842	16	>100:1			1000.00	888.56		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.140	0	284377	16	>100:1			1000.00	999.84	97.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.129	2.140	0/0	321218	15	>100:1	Target = 3.65		884.00	820.34		
298.9 > 99	44	2.129	2.140		91440	16	>100:1	3.51 (1.82-5.48)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.484	2.493	0/0	250830	19	>100:1	Target = 3.30		938.00	863.66		
349 > 99	44	2.484	2.493		86807	17	>100:1	2.88 (1.65-4.96)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.415	0	224894	17	>100:1			5000.00	4898.51	93.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.415	2.415	0/0	81546	17	>100:1	Target = 1.50		934.00	1028.25		
327 > 81	63	2.406	2.415		46393	17	>100:1	1.75 (0.75-2.25)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.449	2.459	0	916367	18	>100:1			1000.00	1082.63	105.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.449	2.459	0/0	783007	19	>100:1	Target = 16.42		1000.00	892.38		
313 > 119	49	2.449	2.459		45551	23	>100:1	17.18 (8.21-24.64)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.571	2.579	0	629007	18	>100:1			5000.00	4428.44	86	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.562	2.579	0/0	228027	18	>100:1	Target = 0.77		2000.00	2264.51		
285 > 185	66	2.571	2.579		258930	18	>100:1	0.88 (0.38-1.16)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.847	0	911800	18	>100:1			1000.00	1027.01	96.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.847	0/0	790132	18	>100:1	Target = 3.14		1000.00	977.25		
363 > 169	47	2.827	2.847		227147	20	>100:1	3.47 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.864	0	264300	17	>100:1			1000.00	1052.02	96.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.864	0/0	241430	27	>100:1	Target = 3.31	0.20	910.00	815.37		
399 > 99	45	2.845	2.864		70987	29	>100:1	3.40 (1.66-4.98)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.871	2.882	0/0	1128884	17	>100:1	Target = 2.54		942.00	818.92		
377 > 85	45	2.871	2.882		467430	19	>100:1	2.41 (1.27-3.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.228	3.243	1/1	228587	23	>100:1	Target = 3.57		952.00	894.25		
449 > 99	45	3.228	3.243		63745	21	>100:1	3.58 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.190	3.205	0	208864	24	>100:1			5000.00	5632.17	95.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.183	3.211	0/0	81185	24	>100:1	Target = 1.48		948.00	978.61		
427 > 81	64	3.196	3.211		52687	25	>100:1	1.54 (0.74-2.23)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.215	3.230	0	913728	22	>100:1			1000.00	1069.82	103.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.215	3.237	0/0	856312	22	>100:1	Target = 2.75		1000.00	961.35		
413 > 169	53	3.221	3.237		318444	20	>100:1	2.68 (1.37-4.13)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.587	3.598	0	224820	20	>100:1			1000.00	1053.40	97.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.587	3.598	0/0	210930	35	>100:1	Target = 3.90	0.29	928.00	858.50		
499 > 99	54	3.594	3.598		61102	35	>100:1	3.45 (1.95-5.85)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.789	3.810	0/0	559816	20	>100:1			932.00	898.01		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.923	3.938	0/0	181528	25	>100:1	Target = 3.46		960.00	927.37		
549 > 99	54	3.923	3.938		55884	17	>100:1	3.24 (1.73-5.20)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.217	4.233	0/0	184491	15	>100:1	Target = 3.36		964.00	884.68		
599 > 99	54	4.217	4.233		66869	15	>100:1	2.75 (1.68-5.04)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.374	4.390	0/0	500171	15	>100:1			942.00	896.34		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.715	4.731	0/0	183331	18	>100:1	Target = 3.51		968.00	946.22		
699 > 99	54	4.715	4.731		55794	17		3.28 (1.75-5.27)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.594	3.606	1	1004264	19	>100:1			1000.00	1134.66	109.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.594	3.613	0/-1	779375	20	>100:1	Target = 4.84		1000.00	914.62		
463 > 169	56	3.594	3.613		151655	20	>100:1	5.13 (2.42-7.26)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.886	3.884	1	409255	18	>100:1			1000.00	1020.77	91.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.886	3.884	1/0	426629	20	>100:1	Target = 42.34		1000.00	1054.71		
498>478	55	3.886	3.884		11632	16	81:1	36.67 (21.17-63.51)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.923	3.946	0	178582	21				5000.00	6253.77	98.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.923	3.954	0/0	55787	19	>100:1	Target = 1.37		958.00	1008.48		
527 > 81	65	3.923	3.954		33325	17	>100:1	1.67 (0.68-2.05)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.514	4.529	0/0	59568	23	>100:1	Target = 2.23		964.00	778.15		
627 > 80	65	4.514	4.529		27453	16	>100:1	2.16 (1.11-3.35)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.939	3.946	1	819784	18	>100:1			1000.00	1140.52	99.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.931	3.946	0/-1	696461	17	>100:1	Target = 11.16		1000.00	935.99		
513 > 169	51	3.931	3.946		68319	17	>100:1	10.19 (5.58-16.75)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.085	4.100	0	935910	17	>100:1			5000.00	5227.48	90.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.094	4.108	0/0	153060	34	>100:1	Target = 1.39		1000.00	1109.89		M
570 > 483	58	4.094	4.108		96706	31	>100:1	1.58 (0.69-2.09)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.235	4.252	0	871916	16	>100:1			1000.00	1296.50	112.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.235	4.252	0/0	670077	16	>100:1	Target = 10.79		1000.00	855.47		
563 > 169	52	4.245	4.252		55262	17	>100:1	12.12 (5.39-16.19)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.245	4.252	1	870147	18	>100:1			5000.00	5373.16	93.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.245	4.262	-1/-2	169850	34		Target = 1.79		1000.00	1017.66		M
584 > 526	60	4.245	4.262		100109	33	>100:1	1.69 (0.89-2.69)	0.21				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.301	4.290	1	146339	16	>100:1			1000.00	975.15	109.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.310	4.308	1/0	146572	23	>100:1			1000.00	1054.43		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.320	4.318	0	62363	13	>100:1			1000.00	1048.50	90.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.320	4.327	0/0	59739	14	49:1	Target = 1.04		1000.00	944.62		
512 > 219	57	4.320	4.327		58469	14	>100:1	1.02 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.506	4.521	0	786044	16	>100:1			1000.00	1084.05	99.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.506	4.521	0/0	650921	16	>100:1	Target = 7.82		1000.00	867.52		
613 > 169	38	4.506	4.521		90452	16	>100:1	7.19 (3.91-11.73)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.739	4.762	0/0	276799	20	>100:1	Target = 3.35		1000.00	884.17		
663 > 169	38	4.739	4.762		83771	19	>100:1	3.30 (1.67-5.03)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.457	4.455	0	146212	16	>100:1			1000.00	1019.89	95.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.473	4.472	0/0	113006	16	>100:1			1000.00	948.95		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.472	0	54552	14	>100:1			1000.00	949.67	73.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.490	4.480	1/1	56746	15	>100:1	Target = 1.06		1000.00	990.73		
526 > 219	59	4.490	4.480		51129	15	>100:1	1.10 (0.53-1.59)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.950	4.980	0	824879	16	>100:1			1000.00	1043.07	102.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.958	4.980	0/0	565986	16	75:1	Target = 9.29		1000.00	843.87		
713 > 169	42	4.958	4.980		60664	16	>100:1	9.32 (4.64-13.94)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.340	5.365	0	419359	17	>100:1			1000.00	1029.73	83	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.340	5.373	0/0	643586	17	70:1	Target = 13.38		1000.00	954.53		
813 > 269	40	5.340	5.373		48086	17	>100:1	13.38 (6.69-20.07)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.709	5.744	0/0	496657	23	54:1	Target = 106.35		1000.00	997.12		
913 > 319	40	5.709	5.744		4917	22	>100:1	101.00 (53.17-159.53)					
*** 37 13C2_PFDA**													
515 > 470		3.931	3.946	0	781003	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.467	0	729592	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.215	3.237	0	891942	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.713	1.719	0	935524	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.587	3.606	0	208659	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072721-DOD.b\072721005.d
Injection Date: 27-Jul-2021 14:31:00 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	557527			99	50 - 150
8 PFBA			100.00	108.25	108.2	70 - 130
D 50 13C5_PFPeA	523546	527160			100.7	50 - 150
21 PFPeA			100.00	98.651	98.7	70 - 130
7 PFBS			88.400	85.485	96.7	70 - 130
D 44 13C3_PFBS	169277	183413			108.4	50 - 150
D 63 13C2_4:2 FTS_2	90196	95364			105.7	50 - 150
1 4:2 FTS			93.400	83.207	89.1	70 - 130
D 49 13C5_PFHxA	600114	616730			102.8	50 - 150
15 PFHxA			100.00	97.160	97.2	70 - 130
22 PFPeS			93.800	89.086	95	70 - 130
28 GenX			200.00	216.77	108.4	70 - 130
D 66 13C3_GenX	1000599	1195525			119.5	50 - 150
D 47 13C4_PFHpA	482787	481010			99.6	50 - 150
13 PFHpA			100.00	102.61	102.6	70 - 130
D 45 13C3_PFHxS	137682	142880			103.8	50 - 150
14 PFHxS			91.000	90.305	99.2	70 - 130
29 ADONA			94.200	95.445	101.3	70 - 130
D 64 13C2_6:2 FTS_2	77321	79681			103.1	50 - 150
2 6:2 FTS			94.800	152.62	161	70 - 130
20 PFOA			100.00	97.028	97	70 - 130
D 53 13C8_PFOA	538966	512318			95.1	50 - 150
12 PFHpS			95.200	89.892	94.4	70 - 130
18 PFOS			92.800	102.91	110.9	70 - 130
D 54 13C8_PFOS	139992	150996			107.9	50 - 150
17 PFNA			100.00	101.76	101.8	70 - 130
D 56 13C9_PFNA	618881	627858			101.5	50 - 150
30 9Cl-PF3ONS			93.200	91.101	97.7	70 - 130
D 55 13C8_PFOSA	250019	287887			115.1	50 - 150
19 PFOSA			100.00	112.82	112.8	70 - 130
16 PFNS			96.000	97.244	101.3	70 - 130
D 65 13C2_8:2 FTS_2	72182	87630			121.4	50 - 150
10 PFDA			100.00	109.51	109.5	70 - 130
3 8:2 FTS			95.800	92.281	96.3	70 - 130
D 51 13C6_PFDA	590501	589722			99.9	50 - 150
D 58 d3-MeFOSAA	601725	633858			105.3	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	126.26	126.3	70 - 130
9 PFDS			96.400	89.938	93.3	70 - 130
D 52 13C7_PFUdA	707587	612148			86.5	50 - 150
25 PFUdA			100.00	98.758	98.8	70 - 130
D 60 d5-EtFOSAA	521292	607333			116.5	50 - 150
5 N-EtFOSAA			100.00	102.60	102.6	70 - 130
D 61 d7-MeFOSE	68295	87856			128.6	50 - 150
32 MeFOSE			100.00	99.316	99.3	70 - 130
D 57 d3-MeFOSA	40777	47214			115.8	50 - 150
26 MeFOSA			100.00	141.49	141.5	70 - 130
31 11Cl-PF3OUDS			94.200	90.734	96.3	70 - 130
D 62 d9-EtFOSE	68452	96174			140.5	50 - 150
33 EtFOSE			100.00	95.994	96	70 - 130
D 59 d5-EtFOSA	38025	48187			126.7	50 - 150
27 EtFOSA			100.00	93.147	93.1	70 - 130
11 PFDoA			100.00	105.30	105.3	70 - 130
D 38 13C2_PFDoA	745164	647589			86.9	50 - 150
4 10:2 FTS			96.400	54.998	57.1	70 - 130
34 PFDOS			96.800	96.936	100.1	70 - 130
24 PFTrDA			100.00	114.49	114.5	70 - 130
23 PFTeDA			100.00	94.825	94.8	70 - 130
D 42 13C2_PFTeDA	846373	797332			94.2	50 - 150
D 40 13C2_PFHxDA	768834	877076			114.1	50 - 150
35 PFHxDA			100.00	112.48	112.5	70 - 130
36 PFODA			100.00	107.58	107.6	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072721-DOD.b\072721005.d
Injection Date: 27-Jul-2021 14:31:00 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.717	1.717	1	557527	21	>100:1			1000.00	1011.12	99	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.717	1.717	1/0	58194	21	65:1			100.00	108.25		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.087	2.087	1	527160	17	>100:1			1000.00	1020.96	100.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.087	2.087	1/0	55192	20	81:1			100.00	98.651		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.150	2.150	2	183413	15	>100:1			1000.00	1056.73	108.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.140	1/-1	20272	14	>100:1	Target = 3.42		88.400	85.485		
298.9 > 99	44	2.150	2.140		6047	15	48:1	3.35 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.486	2.486	2/0	15272	22	>100:1	Target = 2.97		93.800	89.086		
349 > 99	44	2.486	2.486		5335	18	91:1	2.86 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.406	1	95364	17	>100:1			5000.00	4783.54	105.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.406	1/0	3206	20		Target = 1.63		93.400	83.207		
327 > 81	63	2.415	2.406		2855	16	21:1	1.12 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.450	2	616730	18	>100:1			1000.00	1022.65	102.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.450	2/0	61253	17	>100:1	Target = 18.20		100.00	97.160		
313 > 119	49	2.450	2.450		3952	22	22:1	15.49 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.566	2.566	2	1195525	17	>100:1			5000.00	5613.56	119.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.566	2.566	2/0	35689	16	56:1	Target = 0.78		200.00	216.77		
285 > 185	66	2.566	2.566		44795	17	>100:1	0.79 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.826	2	481010	18	>100:1			1000.00	991.80	99.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.826	2.826	2/0	55350	18	71:1	Target = 3.72		100.00	102.61		
363 > 169	47	2.826	2.826		13581	17	98:1	4.07 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.835	2	142880	17	>100:1			1000.00	1028.79	103.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.835	2/0	13817	28	91:1	Target = 3.04	0.18	91.000	90.305		
399 > 99	45	2.844	2.835		4574	29	31:1	3.02 (1.52-4.56)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.863	2/0	85078	26	>100:1	Target = 3.02		94.200	95.445		
377 > 85	45	2.854	2.863		28184	17	>100:1	3.01 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.205	3.205	2/0	12597	24	73:1	Target = 3.10		95.200	89.892		
449 > 99	45	3.218	3.205		5181	26	43:1	2.43 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.178	2	79681	24	>100:1			5000.00	5080.80	103.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.178	3.178	2/0	6860	20	72:1	Target = 1.81		94.800	152.62		
427 > 81	64	3.172	3.178		3952	16	45:1	1.73 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.198	3.198	2	512318	20	>100:1			1000.00	1035.48	95.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.205	2/0	47196	19	45:1	Target = 2.85		100.00	97.028		
413 > 169	53	3.198	3.205		17059	18	73:1	2.76 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.574	3.574	2	150996	18	>100:1			1000.00	1084.15	107.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.582	0/-2	19899	34	12:1	Target = 3.31	0.23	92.800	102.91		M
499 > 99	54	3.574	3.582		4314	27	29:1	4.61 (1.65-4.96)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.780	3.780	2/0	49603	18	>100:1			93.200	91.101		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.917	3.917	2/0	11697	22	69:1	Target = 2.73		96.000	97.244		
549 > 99	54	3.909	3.917		5140	12	51:1	2.27 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.221	4.221	2/0	11140	21	>100:1	Target = 2.65		96.400	89.938		
599 > 99	54	4.221	4.221		5991	20		1.85 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.378	4.378	2/0	44092	17	>100:1			94.200	90.734		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.718	4.718	2/0	12261	16		Target = 3.07		96.800	96.936		
699 > 99	54	4.718	4.718		4179	22		2.93 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.574	3.574	1	627858	19	>100:1			1000.00	1030.64	101.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.582	3.582	2/1	67311	18	>100:1	Target = 6.36		100.00	101.76		
463 > 169	56	3.582	3.582		10702	24	80:1	6.28 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.884	3.884	1	287887	17	>100:1			1000.00	1078.31	115.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													a
498 > 78	55	3.876	3.876	1/0	34697	18	>100:1	Target = 37.21		100.00	112.82		
498>478	55	3.852	3.876		515	12	3.8:1	67.37 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.917	3.917	1	87630	17				5000.00	5177.21	121.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.917	3.917	1/0	3716	21	14:1	Target = 1.87		95.800	92.281		
527 > 81	65	3.925	3.917		2204	17	14:1	1.68 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.513	4.513	2/1	3992	22		Target = 3.27		96.400	54.998		
627 > 80	65	4.513	4.513		1728	20	18:1	2.31 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.925	3.925	2	589722	17	>100:1			1000.00	999.77	99.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.925	3.925	2/0	68831	15	>100:1	Target = 13.00		100.00	109.51		
513 > 169	51	3.917	3.925		4703	13	45:1	14.63 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.084	4.084	2	633858	17	>100:1			5000.00	4748.55	105.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.084	4.084	0/-2	12507	28	69:1	Target = 1.39		100.00	126.26		M
570 > 483	58	4.084	4.084		6958	30		1.79 (0.69-2.09)	0.11				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.231	4.231	2	612148	16				1000.00	931.91	86.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.242	4.242	2/0	53474	13	75:1	Target = 13.51		100.00	98.758		
563 > 169	52	4.242	4.242		4091	20	37:1	13.07 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.242	4.242	2	607333	16	>100:1			5000.00	5284.36	116.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.242	4.242	1/-1	12365	25		Target = 1.80		100.00	102.60		M
584 > 526	60	4.252	4.242		7416	30	33:1	1.66 (0.90-2.70)	0.21				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.302	4.302	0	87856	19	>100:1			1000.00	1169.57	128.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.312	4.312	0/0	9974	12	68:1			100.00	99.316		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.323	4.323	0	47214	14	>100:1			1000.00	959.68	115.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.333	4.333	1/1	6574	13	14:1	Target = 1.02		100.00	141.49		
512 > 219	57	4.333	4.333		3943	21	45:1	1.66 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.468	4.468	0	96174	15	>100:1			1000.00	1228.60	140.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.486	4.486	1/1	11000	21	89:1			100.00	95.994		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.495	4.495	1	48187	19	>100:1			1000.00	1159.84	126.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.504	4.504	1/0	5760	18	47:1	Target = 0.97		100.00	93.147		
526 > 219	59	4.513	4.504		5607	15	31:1	1.02 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.513	4.513	2	647589	16	>100:1			1000.00	872.26	86.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.513	2/0	69075	21	54:1	Target = 11.10		100.00	105.30		
613 > 169	38	4.513	4.513		5833	20	45:1	11.84 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.752	4.752	3/1	59552	17	>100:1	Target = 7.97		100.00	114.49		
663 > 169	38	4.739	4.752		7364	19	>100:1	8.08 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	4.964	2	797332	18	>100:1			1000.00	911.21	94.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.964	4.964	2/0	60906	16	28:1	Target = 11.40		100.00	94.825		
713 > 169	42	4.956	4.964		5670	18	84:1	10.74 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.343	5.343	2	877076	18	>100:1			1000.00	1047.78	114.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.351	5.351	3/1	58947	18	13:1	Target = 10.50		100.00	112.48		
813 > 269	40	5.343	5.351		5620	23	>100:1	10.48 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.716	5.716	4/2	85985	23	>100:1	Target = 13.22		100.00	107.58		
913 > 319	40	5.716	5.716		6444	22	>100:1	13.34 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.925	3.925	2	637417	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.450	2	584100	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.198	3.198	2	502235	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.717	1.717	1	492523	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.574	3.574	2	135362	23							

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072721-DOD.b\072721006.d
Injection Date: 27-Jul-2021 14:41:33 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	557527	556574			99.8	50 - 150
8 PFBA			200.00	205.16	102.6	70 - 130
D 50 13C5_PFPeA	527160	511851			97.1	50 - 150
21 PFPeA			200.00	198.21	99.1	70 - 130
7 PFBS			176.80	170.57	96.5	70 - 130
D 44 13C3_PFBS	183413	176619			96.3	50 - 150
D 63 13C2_4:2 FTS_2	95364	100552			105.4	50 - 150
1 4:2 FTS			186.80	170.50	91.3	70 - 130
D 49 13C5_PFHxA	616730	594587			96.4	50 - 150
15 PFHxA			200.00	212.20	106.1	70 - 130
22 PFPeS			187.60	197.00	105	70 - 130
28 GenX			400.00	441.31	110.3	70 - 130
D 66 13C3_GenX	1195525	1174653			98.3	50 - 150
D 47 13C4_PFHpA	481010	486578			101.2	50 - 150
13 PFHpA			200.00	186.17	93.1	70 - 130
D 45 13C3_PFHxS	142880	145696			102	50 - 150
14 PFHxS			182.00	174.81	96.1	70 - 130
29 ADONA			188.40	183.15	97.2	70 - 130
D 64 13C2_6:2 FTS_2	79681	86050			108	50 - 150
2 6:2 FTS			189.60	224.60	118.5	70 - 130
20 PFOA			200.00	189.51	94.8	70 - 130
D 53 13C8_PFOA	512318	507939			99.1	50 - 150
12 PFHpS			190.40	204.52	107.4	70 - 130
18 PFOS			185.60	188.00	101.3	70 - 130
D 54 13C8_PFOS	150996	150659			99.8	50 - 150
17 PFNA			200.00	213.21	106.6	70 - 130
D 56 13C9_PFNA	627858	619580			98.7	50 - 150
30 9Cl-PF3ONS			186.40	179.39	96.2	70 - 130
D 55 13C8_PFOSA	287887	292910			101.7	50 - 150
19 PFOSA			200.00	194.26	97.1	70 - 130
16 PFNS			192.00	176.02	91.7	70 - 130
D 65 13C2_8:2 FTS_2	87630	87644			100	50 - 150
10 PFDA			200.00	215.98	108	70 - 130
3 8:2 FTS			191.60	201.04	104.9	70 - 130
D 51 13C6_PFDA	589722	575656			97.6	50 - 150
D 58 d3-MeFOSAA	633858	705000			111.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	179.46	89.7	70 - 130
9 PFDS			192.80	171.79	89.1	70 - 130
D 52 13C7_PFUdA	612148	612377			100	50 - 150
25 PFUdA			200.00	218.09	109	70 - 130
D 60 d5-EtFOSAA	607333	683550			112.5	50 - 150
5 N-EtFOSAA			200.00	148.47	74.2	70 - 130
D 61 d7-MeFOSE	87856	82336			93.7	50 - 150
32 MeFOSE			200.00	196.81	98.4	70 - 130
D 57 d3-MeFOSA	47214	49631			105.1	50 - 150
26 MeFOSA			200.00	216.93	108.5	70 - 130
31 11Cl-PF3OUDS			188.40	179.71	95.4	70 - 130
D 62 d9-EtFOSE	96174	97154			101	50 - 150
33 EtFOSE			200.00	183.69	91.8	70 - 130
D 59 d5-EtFOSA	48187	54371			112.8	50 - 150
27 EtFOSA			200.00	150.61	75.3	70 - 130
11 PFDoA			200.00	199.45	99.7	70 - 130
D 38 13C2_PFDoA	647589	629609			97.2	50 - 150
4 10:2 FTS			192.80	137.24	71.2	70 - 130
34 PFDOS			193.60	180.75	93.4	70 - 130
24 PFTrDA			200.00	222.82	111.4	70 - 130
23 PFTeDA			200.00	210.81	105.4	70 - 130
D 42 13C2_PFTeDA	797332	789745			99	50 - 150
D 40 13C2_PFHxDA	877076	889199			101.4	50 - 150
35 PFHxDA			200.00	214.08	107	70 - 130
36 PFODA			200.00	205.06	102.5	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072721-DOD.b\072721006.d
Injection Date: 27-Jul-2021 14:41:33 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.717	0	556574	21	>100:1			1000.00	1009.39	99.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.722	1.717	1/1	110108	21	>100:1			200.00	205.16		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.094	2.087	1	511851	15	>100:1			1000.00	991.31	97.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.094	2.087	1/0	107671	14	>100:1			200.00	198.21		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.146	2.150	0	176619	17	>100:1			1000.00	1017.59	96.3	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.146	2.140	1/1	38951	17	>100:1	Target = 3.42		176.80	170.57		
298.9 > 99	44	2.146	2.140		11806	17	>100:1	3.29 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.486	2.486	0/0	32520	17	>100:1	Target = 2.97		187.60	197.00		
349 > 99	44	2.477	2.486		9502	16	74:1	3.42 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.414	2.406	1	100552	19	>100:1			5000.00	5043.78	105.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.414	2.406	1/0	6927	17	>100:1	Target = 1.63		186.80	170.50		
327 > 81	63	2.406	2.406		5186	20	22:1	1.33 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.450	0	594587	17	>100:1			1000.00	985.94	96.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.450	0/0	128975	17	>100:1	Target = 18.20		200.00	212.20		
313 > 119	49	2.450	2.450		6995	21	91:1	18.43 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.566	2.566	0	1174653	18	>100:1			5000.00	5515.56	98.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.566	2.566	0/0	71389	18	>100:1	Target = 0.78		400.00	441.31		
285 > 185	66	2.566	2.566		90597	21	>100:1	0.78 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.826	0	486578	18	>100:1			1000.00	1003.28	101.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.826	2.826	0/0	101583	18	>100:1	Target = 3.72		200.00	186.17		
363 > 169	47	2.817	2.826		29320	17	>100:1	3.46 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.835	0	145696	17	>100:1			1000.00	1049.06	102	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.835	0/0	27274	24	>100:1	Target = 3.04	0.22	182.00	174.81		
399 > 99	45	2.835	2.835		12196	24	69:1	2.23 (1.52-4.56)	0.15				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.863	0/0	166471	17	>100:1	Target = 3.02		188.40	183.15		
377 > 85	45	2.853	2.863		56147	18	>100:1	2.96 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.211	3.205	1/1	29225	21	>100:1	Target = 3.10		190.40	204.52		
449 > 99	45	3.205	3.205		8788	18	64:1	3.32 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.178	0	86050	20	>100:1			5000.00	5486.92	108	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.171	3.178	0/0	10902	22	47:1	Target = 1.81		189.60	224.60		
427 > 81	64	3.185	3.178		6537	21	89:1	1.66 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.198	1	507939	21	>100:1			1000.00	1026.63	99.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.205	0/-1	91392	19	>100:1	Target = 2.85		200.00	189.51		
413 > 169	53	3.205	3.205		33159	25	>100:1	2.75 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.574	3.574	0	150659	18	>100:1			1000.00	1081.74	99.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.574	3.582	0/0	33877	34	19:1	Target = 3.31	0.22	185.60	188.00		M
499 > 99	54	3.574	3.582		10304	38	69:1	3.28 (1.65-4.96)	0.16				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.779	3.780	0/0	97458	18	>100:1			186.40	179.39		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.917	3.917	0/0	21125	17	86:1	Target = 2.73		192.00	176.02		
549 > 99	54	3.917	3.917		9023	22	35:1	2.34 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.221	4.221	0/0	20486	20	88:1	Target = 2.65		192.80	171.79		
599 > 99	54	4.221	4.221		11042	19	>100:1	1.85 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.378	4.378	1/1	87134	15	>100:1			188.40	179.71		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.718	4.718	0/0	22811	18	>100:1	Target = 3.07		193.60	180.75		
699 > 99	54	4.725	4.718		8560	21	>100:1	2.66 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.574	3.574	0	619580	17	>100:1			1000.00	1017.05	98.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.582	3.582	0/0	139176	18	>100:1	Target = 6.36		200.00	213.21		
463 > 169	56	3.574	3.582		21205	23	>100:1	6.56 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.884	3.884	0	292910	18	>100:1			1000.00	1097.13	101.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.884	3.876	1/1	60788	16	>100:1	Target = 37.21		200.00	194.26		
498>478	55	3.884	3.876		2457	15		24.74 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.917	3.917	0	87644	18	>100:1			5000.00	5178.04	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.925	3.917	1/1	8097	19	27:1	Target = 1.87		191.60	201.04		
527 > 81	65	3.917	3.917		3712	21	33:1	2.18 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.522	4.513	1/1	9963	20		Target = 3.27		192.80	137.24		
627 > 80	65	4.513	4.513		2647	19		3.76 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.925	3.925	0	575656	17	>100:1			1000.00	975.93	97.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.925	3.925	0/0	132511	17	>100:1	Target = 13.00		200.00	215.98		
513 > 169	51	3.925	3.925		10672	23	>100:1	12.41 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.084	4.084	0	705000	17	>100:1			5000.00	5281.51	111.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.093	4.084	1/1	19772	27		Target = 1.39		200.00	179.46		M
570 > 483	58	4.084	4.084		15288	36	69:1	1.29 (0.69-2.09)	0.27				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.242	4.231	1	612377	15	>100:1			1000.00	932.26	100	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.242	4.242	0/-1	118131	15	>100:1	Target = 13.51		200.00	218.09		
563 > 169	52	4.231	4.242		6738	16	43:1	17.53 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.242	4.242	0	683550	15	>100:1			5000.00	5947.52	112.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.252	4.242	1/1	20139	29	66:1	Target = 1.80		200.00	148.47		M
584 > 526	60	4.252	4.242		15382	27	67:1	1.30 (0.90-2.70)	0.11				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.312	4.302	1	82336	14	>100:1			1000.00	1096.09	93.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.322	4.312	1/0	18523	12	90:1			200.00	196.81		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.332	4.323	1	49631	21	>100:1			1000.00	1008.81	105.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.332	4.333	0/-1	10595	13	61:1	Target = 1.02		200.00	216.93		
512 > 219	57	4.332	4.333		9478	13	93:1	1.11 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.477	4.468	1	97154	19	>100:1			1000.00	1241.12	101	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.486	4.486	1/0	21263	21	>100:1			200.00	183.69		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.486	4.495	0	54371	13	>100:1			1000.00	1308.69	112.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.504	4.504	1/1	9756	11	66:1	Target = 0.97		200.00	150.61		
526 > 219	59	4.495	4.504		10099	11	79:1	0.96 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.504	4.513	0	629609	16	>100:1			1000.00	848.04	97.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.513	1/1	127200	16	66:1	Target = 11.10		200.00	199.45		
613 > 169	38	4.504	4.513		11844	21	>100:1	10.73 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.745	4.752	0/0	112679	19	>100:1	Target = 7.97		200.00	222.82		
663 > 169	38	4.745	4.752		16040	17	>100:1	7.02 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	4.964	0	789745	18	>100:1			1000.00	902.54	99	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.964	4.964	0/0	134117	16	21:1	Target = 11.40		200.00	210.81		
713 > 169	42	4.964	4.964		11228	19	94:1	11.94 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.351	5.343	1	889199	17	>100:1			1000.00	1062.26	101.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.351	5.351	0/-1	113747	19	27:1	Target = 10.50		200.00	214.08		
813 > 269	40	5.351	5.351		10562	19	>100:1	10.76 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.716	5.716	0/-1	166166	23	16:1	Target = 13.22		200.00	205.06		
913 > 319	40	5.716	5.716		12702	23	>100:1	13.08 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.925	3.925	0	691109	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.450	0	608692	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.198	1	503813	20	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.715	1.717	0	508470	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.574	3.574	0	144407	16	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072721-DOD.b\072721025.d
Injection Date: 27-Jul-2021 18:03:42 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 18
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	557527	533377			95.7	50 - 150
8 PFBA			1000.00	919.50	92	70 - 130
D 50 13C5_PFPeA	527160	519869			98.6	50 - 150
21 PFPeA			1000.00	884.86	88.5	70 - 130
7 PFBS			884.00	849.41	96.1	70 - 130
D 44 13C3_PFBS	183413	168642			91.9	50 - 150
D 63 13C2_4:2 FTS_2	95364	84368			88.5	50 - 150
1 4:2 FTS			934.00	874.57	93.6	70 - 130
D 49 13C5_PFHxA	616730	575870			93.4	50 - 150
15 PFHxA			1000.00	896.15	89.6	70 - 130
22 PFPeS			938.00	951.02	101.4	70 - 130
28 GenX			2000.00	1980.04	99	70 - 130
D 66 13C3_GenX	1195525	1054136			88.2	50 - 150
D 47 13C4_PFHpA	481010	491379			102.2	50 - 150
13 PFHpA			1000.00	882.35	88.2	70 - 130
D 45 13C3_PFHxS	142880	148652			104	50 - 150
14 PFHxS			910.00	821.00	90.2	70 - 130
29 ADONA			942.00	837.82	88.9	70 - 130
D 64 13C2_6:2 FTS_2	79681	77459			97.2	50 - 150
2 6:2 FTS			948.00	714.45	75.4	70 - 130
20 PFOA			1000.00	920.02	92	70 - 130
D 53 13C8_PFOA	512318	493180			96.3	50 - 150
12 PFHpS			952.00	845.53	88.8	70 - 130
18 PFOS			928.00	794.51	85.6	70 - 130
D 54 13C8_PFOS	150996	154501			102.3	50 - 150
17 PFNA			1000.00	896.45	89.6	70 - 130
D 56 13C9_PFNA	627858	604526			96.3	50 - 150
30 9Cl-PF3ONS			932.00	844.99	90.7	70 - 130
D 55 13C8_PFOSA	287887	261945			91	50 - 150
19 PFOSA			1000.00	1000.13	100	70 - 130
16 PFNS			960.00	843.91	87.9	70 - 130
D 65 13C2_8:2 FTS_2	87630	85238			97.3	50 - 150
10 PFDA			1000.00	953.28	95.3	70 - 130
3 8:2 FTS			958.00	1030.66	107.6	70 - 130
D 51 13C6_PFDA	589722	577544			97.9	50 - 150
D 58 d3-MeFOSAA	633858	623192			98.3	50 - 150

Report Date: 28-Jul-2021 18:06:37 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\ll\LCMSMS02.i\072721-DOD.b\072721025.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1114.88	111.5	70 - 130
9 PFDS			964.00	891.98	92.5	70 - 130
D 52 13C7_PFUdA	612148	597349			97.6	50 - 150
25 PFUdA			1000.00	995.81	99.6	70 - 130
D 60 d5-EtFOSAA	607333	614985			101.3	50 - 150
5 N-EtFOSAA			1000.00	933.67	93.4	70 - 130
D 61 d7-MeFOSE	87856	78309			89.1	50 - 150
32 MeFOSE			1000.00	992.11	99.2	70 - 130
D 57 d3-MeFOSA	47214	49939			105.8	50 - 150
26 MeFOSA			1000.00	1104.33	110.4	70 - 130
31 11Cl-PF3OUDS			942.00	801.75	85.1	70 - 130
D 62 d9-EtFOSE	96174	89737			93.3	50 - 150
33 EtFOSE			1000.00	928.91	92.9	70 - 130
D 59 d5-EtFOSA	48187	47532			98.6	50 - 150
27 EtFOSA			1000.00	968.08	96.8	70 - 130
11 PFDoA			1000.00	951.14	95.1	70 - 130
D 38 13C2_PFDoA	647589	617917			95.4	50 - 150
4 10:2 FTS			964.00	557.52	57.8	70 - 130
34 PFDOS			968.00	831.90	85.9	70 - 130
24 PFTrDA			1000.00	999.54	100	70 - 130
23 PFTeDA			1000.00	914.23	91.4	70 - 130
D 42 13C2_PFTeDA	797332	813605			102	50 - 150
D 40 13C2_PFHxDA	877076	813115			92.7	50 - 150
35 PFHxDA			1000.00	1081.43	108.1	70 - 130
36 PFODA			1000.00	1072.56	107.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072721-DOD.b\072721025.d
Injection Date: 27-Jul-2021 18:03:42 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 18
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.717	0	533377	20	>100:1			1000.00	967.32	95.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.717	0/0	472922	20	>100:1			1000.00	919.50		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.087	2.087	1	519869	17	>100:1			1000.00	1006.84	98.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.087	2.087	1/0	488201	17	>100:1			1000.00	884.86		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.150	0	168642	15	>100:1			1000.00	971.63	91.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.140	1/1	185209	15	>100:1	Target = 3.42		884.00	849.41		
298.9 > 99	44	2.140	2.140		52480	17	>100:1	3.52 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.486	0/0	149904	17	>100:1	Target = 2.97		938.00	951.02		
349 > 99	44	2.477	2.486		49210	21		3.04 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.406	1	84368	17	>100:1			5000.00	4231.97	88.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.406	1/0	29812	16		Target = 1.63		934.00	874.57		
327 > 81	63	2.406	2.406		16999	15	>100:1	1.75 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.450	1	575870	17	>100:1			1000.00	954.90	93.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.451	2.450	1/0	527534	17	>100:1	Target = 18.20		1000.00	896.15		
313 > 119	49	2.451	2.450		29975	17	>100:1	17.59 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.566	0	1054136	19	>100:1			5000.00	4949.67	88.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.566	1/1	287440	17	>100:1	Target = 0.78		2000.00	1980.04		
285 > 185	66	2.558	2.566		359321	18	>100:1	0.79 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.826	0	491379	17	>100:1			1000.00	1013.18	102.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.826	0/0	486214	17	>100:1	Target = 3.72		1000.00	882.35		
363 > 169	47	2.818	2.826		140912	17	>100:1	3.45 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.835	1	148652	16	>100:1			1000.00	1070.35	104	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.835	1/0	130690	26	>100:1	Target = 3.04	0.17	910.00	821.00		
399 > 99	45	2.836	2.835		43182	22	>100:1	3.02 (1.52-4.56)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.854	2.863	0/-1	776987	18	>100:1	Target = 3.02		942.00	837.82		
377 > 85	45	2.854	2.863		260316	17	>100:1	2.98 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.207	3.205	1/0	123275	20	>100:1	Target = 3.10		952.00	845.53		
449 > 99	45	3.207	3.205		42919	19	>100:1	2.87 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.174	3.178	0	77459	22	>100:1			5000.00	4939.12	97.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.174	3.178	0/0	31217	20	>100:1	Target = 1.81		948.00	714.45		
427 > 81	64	3.180	3.178		17865	18	>100:1	1.74 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.200	3.198	1	493180	22	>100:1			1000.00	996.80	96.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.207	3.205	1/0	430795	21	>100:1	Target = 2.85		1000.00	920.02		
413 > 169	53	3.200	3.205		150693	20	>100:1	2.85 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.576	3.574	1	154501	18	>100:1			1000.00	1109.32	102.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.576	3.582	0/-1	137234	35	>100:1	Target = 3.31	0.26	928.00	794.51		
499 > 99	54	3.576	3.582		46178	39	>100:1	2.97 (1.65-4.96)	0.17				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.782	3.780	1/0	470763	17	>100:1			932.00	844.99		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.920	3.917	1/0	103865	20	>100:1	Target = 2.73		960.00	843.91		
549 > 99	54	3.920	3.917		37969	22	>100:1	2.73 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.226	4.221	1/0	105557	15	>100:1	Target = 2.65		964.00	891.98		
599 > 99	54	4.216	4.221		40500	15	>100:1	2.60 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.382	4.378	1/0	398653	17	>100:1			942.00	801.75		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.721	4.718	1/0	107665	17	>100:1	Target = 3.07		968.00	831.90		
699 > 99	54	4.728	4.718		37934	19	>100:1	2.83 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.584	3.574	1	604526	19	>100:1			1000.00	992.34	96.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.584	3.582	1/0	570941	19	>100:1	Target = 6.36		1000.00	896.45		
463 > 169	56	3.584	3.582		94630	17	>100:1	6.03 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.879	3.884	0	261945	18				1000.00	981.14	91	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.879	3.876	1/1	279872	18	>100:1	Target = 37.21		1000.00	1000.13		
498>478	55	3.879	3.876		8744	21		32.00 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.920	3.917	1	85238	18	>100:1			5000.00	5035.89	97.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.928	3.917	1/0	40370	24	>100:1	Target = 1.87		958.00	1030.66		
527 > 81	65	3.928	3.917		15740	15	>100:1	2.56 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.526	4.513	1/0	39363	19		Target = 3.27		964.00	557.52		
627 > 80	65	4.517	4.513		10642	14		3.69 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.928	3.925	1	577544	18	>100:1			1000.00	979.13	97.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.928	3.925	1/0	586797	17	>100:1	Target = 13.00		1000.00	953.28		
513 > 169	51	3.928	3.925		45005	15	>100:1	13.03 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.088	4.084	1	623192	18	>100:1			5000.00	4668.65	98.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.088	4.084	1/0	108577	31		Target = 1.39	0.08	1000.00	1114.88		M
570 > 483	58	4.088	4.084		72638	31	>100:1	1.49 (0.69-2.09)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.236	4.231	1	597349	15				1000.00	909.38	97.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.236	4.242	0/-1	526161	16	>100:1	Target = 13.51		1000.00	995.81		
563 > 169	52	4.247	4.242		36419	13	>100:1	14.44 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.247	4.242	1	614985	15	>100:1			5000.00	5350.94	101.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.247	4.242	1/0	113941	32	>100:1	Target = 1.80		1000.00	933.67		M
584 > 526	60	4.247	4.242		74165	33	>100:1	1.53 (0.90-2.70)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.297	4.302	0	78309	15	>100:1			1000.00	1042.48	89.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.317	4.312	1/1	88807	17	>100:1			1000.00	992.11		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.327	4.323	1	49939	14	>100:1			1000.00	1015.07	105.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.327	4.333	0/-1	54271	13	>100:1	Target = 1.02		1000.00	1104.33		
512 > 219	57	4.327	4.333		51906	17	>100:1	1.04 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.472	4.468	1	89737	17	>100:1			1000.00	1146.37	93.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.481	4.486	0/-1	99319	16	>100:1			1000.00	928.91		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.490	4.495	0	47532	19	>100:1			1000.00	1144.08	98.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.499	4.504	0/0	49031	18	>100:1	Target = 0.97		1000.00	968.08		
526 > 219	59	4.499	4.504		51408	15	>100:1	0.95 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.508	4.513	0	617917	16	>100:1			1000.00	832.30	95.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.508	4.513	0/0	595323	15	>100:1	Target = 11.10		1000.00	951.14		
613 > 169	38	4.508	4.513		56602	19	>100:1	10.51 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.748	4.752	0/0	496077	20	>100:1	Target = 7.97		1000.00	999.54		
663 > 169	38	4.755	4.752		62087	18	>100:1	7.99 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.973	4.964	1	813605	18	>100:1			1000.00	929.81	102	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.973	4.964	1/0	599197	19	76:1	Target = 11.40		1000.00	914.23		
713 > 169	42	4.973	4.964		52332	17	>100:1	11.44 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.364	5.343	2	813115	18	>100:1			1000.00	971.37	92.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.364	5.351	1/-1	525431	17	>100:1	Target = 10.50		1000.00	1081.43		
813 > 269	40	5.364	5.351		50820	17	>100:1	10.33 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.740	5.716	2/0	794743	23	74:1	Target = 13.22		1000.00	1072.56		
913 > 319	40	5.733	5.716		60691	23	>100:1	13.09 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.928	3.925	1	612413	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.450	1	539861	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.200	3.198	1	474258	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.717	0	466557	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.576	3.574	1	143683	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072721-DOD.b\072721037.d
Injection Date: 27-Jul-2021 20:11:34 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 30
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	557527	529011			94.9	50 - 150
8 PFBA			1000.00	934.83	93.5	70 - 130
D 50 13C5_PFPeA	527160	499985			94.8	50 - 150
21 PFPeA			1000.00	915.44	91.5	70 - 130
7 PFBS			884.00	807.27	91.3	70 - 130
D 44 13C3_PFBS	183413	180601			98.5	50 - 150
D 63 13C2_4:2 FTS_2	95364	78821			82.7	50 - 150
1 4:2 FTS			934.00	941.42	100.8	70 - 130
D 49 13C5_PFHxA	616730	591258			95.9	50 - 150
15 PFHxA			1000.00	914.73	91.5	70 - 130
22 PFPeS			938.00	830.65	88.6	70 - 130
28 GenX			2000.00	1909.07	95.5	70 - 130
D 66 13C3_GenX	1195525	1037821			86.8	50 - 150
D 47 13C4_PFHpA	481010	494040			102.7	50 - 150
13 PFHpA			1000.00	925.74	92.6	70 - 130
D 45 13C3_PFHxS	142880	143136			100.2	50 - 150
14 PFHxS			910.00	853.85	93.8	70 - 130
29 ADONA			942.00	812.37	86.2	70 - 130
D 64 13C2_6:2 FTS_2	79681	80539			101.1	50 - 150
2 6:2 FTS			948.00	898.28	94.8	70 - 130
20 PFOA			1000.00	910.77	91.1	70 - 130
D 53 13C8_PFOA	512318	492157			96.1	50 - 150
12 PFHpS			952.00	893.50	93.9	70 - 130
18 PFOS			928.00	871.39	93.9	70 - 130
D 54 13C8_PFOS	150996	157821			104.5	50 - 150
17 PFNA			1000.00	914.34	91.4	70 - 130
D 56 13C9_PFNA	627858	605809			96.5	50 - 150
30 9Cl-PF3ONS			932.00	795.01	85.3	70 - 130
D 55 13C8_PFOSA	287887	279863			97.2	50 - 150
19 PFOSA			1000.00	977.53	97.8	70 - 130
16 PFNS			960.00	787.44	82	70 - 130
D 65 13C2_8:2 FTS_2	87630	87382			99.7	50 - 150
10 PFDA			1000.00	954.16	95.4	70 - 130
3 8:2 FTS			958.00	900.98	94	70 - 130
D 51 13C6_PFDA	589722	594953			100.9	50 - 150
D 58 d3-MeFOSAA	633858	657220			103.7	50 - 150

Report Date: 28-Jul-2021 18:06:46 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\072721-DOD.b\072721037.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	969.88	97	70 - 130
9 PFDS			964.00	881.54	91.4	70 - 130
D 52 13C7_PFUdA	612148	603762			98.6	50 - 150
25 PFUdA			1000.00	932.35	93.2	70 - 130
D 60 d5-EtFOSAA	607333	612757			100.9	50 - 150
5 N-EtFOSAA			1000.00	1014.49	101.4	70 - 130
D 61 d7-MeFOSE	87856	76496			87.1	50 - 150
32 MeFOSE			1000.00	946.30	94.6	70 - 130
D 57 d3-MeFOSA	47214	51384			108.8	50 - 150
26 MeFOSA			1000.00	1081.11	108.1	70 - 130
31 11Cl-PF3OUDS			942.00	769.21	81.7	70 - 130
D 62 d9-EtFOSE	96174	94673			98.4	50 - 150
33 EtFOSE			1000.00	849.70	85	70 - 130
D 59 d5-EtFOSA	48187	42635			88.5	50 - 150
27 EtFOSA			1000.00	1086.76	108.7	70 - 130
11 PFDoA			1000.00	989.31	98.9	70 - 130
D 38 13C2_PFDoA	647589	623789			96.3	50 - 150
4 10:2 FTS			964.00	647.95	67.2	70 - 130
34 PFDOS			968.00	878.64	90.8	70 - 130
24 PFTrDA			1000.00	1042.00	104.2	70 - 130
23 PFTeDA			1000.00	879.44	87.9	70 - 130
D 42 13C2_PFTeDA	797332	850578			106.7	50 - 150
D 40 13C2_PFHxDA	877076	822579			93.8	50 - 150
35 PFHxDA			1000.00	1039.93	104	70 - 130
36 PFODA			1000.00	1009.07	100.9	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072721-DOD.b\072721037.d
Injection Date: 27-Jul-2021 20:11:34 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 30
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.717	0	529011	20	>100:1			1000.00	959.41	94.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.717	0/0	476870	21	>100:1			1000.00	934.83		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.087	1	499985	15	>100:1			1000.00	968.33	94.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.087	1/0	485757	15	>100:1			1000.00	915.44		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.150	0	180601	17	>100:1			1000.00	1040.53	98.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.140	1/1	188503	14	>100:1	Target = 3.42		884.00	807.27		
298.9 > 99	44	2.141	2.140		54871	15	>100:1	3.43 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.486	0/0	140215	16	>100:1	Target = 2.97		938.00	830.65		
349 > 99	44	2.478	2.486		50222	15	>100:1	2.79 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.406	1	78821	18	>100:1			5000.00	3953.73	82.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.406	1/0	29981	16		Target = 1.63		934.00	941.42		
327 > 81	63	2.407	2.406		17538	23	>100:1	1.70 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.450	0	591258	17	>100:1			1000.00	980.42	95.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.450	0/0	552858	18	>100:1	Target = 18.20		1000.00	914.73		
313 > 119	49	2.442	2.450		27450	22	>100:1	20.14 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.566	0	1037821	17	>100:1			5000.00	4873.07	86.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.566	0/0	272848	18	>100:1	Target = 0.78		2000.00	1909.07		
285 > 185	66	2.558	2.566		369352	18	>100:1	0.73 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.826	0	494040	18	>100:1			1000.00	1018.67	102.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.826	0/0	512884	18	>100:1	Target = 3.72		1000.00	925.74		
363 > 169	47	2.818	2.826		137639	18	>100:1	3.72 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.835	0	143136	17	>100:1			1000.00	1030.63	100.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.835	1/1	130876	25	>100:1	Target = 3.04	0.16	910.00	853.85		
399 > 99	45	2.827	2.835		42625	25	>100:1	3.07 (1.52-4.56)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.855	2.863	0/0	725428	17	>100:1	Target = 3.02		942.00	812.37		
377 > 85	45	2.855	2.863		259233	18	>100:1	2.79 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.205	1/1	125435	23	>100:1	Target = 3.10		952.00	893.50		
449 > 99	45	3.208	3.205		41941	21	>100:1	2.99 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.178	1	80539	20	>100:1			5000.00	5135.51	101.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.178	1/0	40810	20		Target = 1.81		948.00	898.28		
427 > 81	64	3.174	3.178		23252	21	>100:1	1.75 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.201	3.198	1	492157	21	>100:1			1000.00	994.73	96.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.201	3.205	0/-1	425578	21	>100:1	Target = 2.85		1000.00	910.77		
413 > 169	53	3.201	3.205		160601	22	>100:1	2.64 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.577	3.574	1	157821	17	>100:1			1000.00	1133.16	104.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.577	3.582	0/-1	153455	36	>100:1	Target = 3.31	0.25	928.00	871.39		
499 > 99	54	3.577	3.582		39747	31	>100:1	3.86 (1.65-4.96)	0.10				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.783	3.780	1/0	452439	17	>100:1			932.00	795.01		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.912	3.917	0/-1	98998	17	>100:1	Target = 2.73		960.00	787.44		
549 > 99	54	3.921	3.917		31412	16	>100:1	3.15 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.227	4.221	1/0	106574	15	>100:1	Target = 2.65		964.00	881.54		
599 > 99	54	4.227	4.221		40760	22		2.61 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.383	4.378	1/0	390689	18	>100:1			942.00	769.21		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.728	4.718	1/0	116158	19	>100:1	Target = 3.07		968.00	878.64		
699 > 99	54	4.728	4.718		37422	19		3.10 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.577	3.574	1	605809	19	>100:1			1000.00	994.45	96.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.585	3.582	1/0	583570	19	>100:1	Target = 6.36		1000.00	914.34		
463 > 169	56	3.577	3.582		97766	20	>100:1	5.96 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.880	3.884	0	279863	19	>100:1			1000.00	1048.26	97.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.880	3.876	1/1	292260	18	>100:1	Target = 37.21		1000.00	977.53		
498>478	55	3.880	3.876		9110	22	92:1	32.08 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.921	3.917	1	87382	17	>100:1			5000.00	5162.56	99.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.921	3.917	1/0	36178	17	>100:1	Target = 1.87		958.00	900.98		
527 > 81	65	3.929	3.917		17255	17		2.09 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.527	4.513	1/0	46898	16	>100:1	Target = 3.27		964.00	647.95		
627 > 80	65	4.527	4.513		14790	21	>100:1	3.17 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.929	3.925	1	594953	18	>100:1			1000.00	1008.64	100.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.929	3.925	1/0	605041	18	>100:1	Target = 13.00		1000.00	954.16		
513 > 169	51	3.929	3.925		39036	17	>100:1	15.49 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.089	4.084	1	657220	19	>100:1			5000.00	4923.57	103.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.089	4.084	1/0	99613	32	>100:1	Target = 1.39		1000.00	969.88		M
570 > 483	58	4.098	4.084		75690	28	>100:1	1.31 (0.69-2.09)	0.19				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.247	4.231	1	603762	16				1000.00	919.14	98.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.247	4.242	1/0	497918	15	>100:1	Target = 13.51		1000.00	932.35		
563 > 169	52	4.247	4.242		38268	17	>100:1	13.01 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.247	4.242	1	612757	15	>100:1			5000.00	5331.56	100.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.247	4.242	1/0	123356	30	>100:1	Target = 1.80		1000.00	1014.49		M
584 > 526	60	4.247	4.242		67949	31	>100:1	1.81 (0.90-2.70)	0.20				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.302	0	76496	13	>100:1			1000.00	1018.35	87.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.318	4.312	1/1	82746	23	>100:1			1000.00	946.30		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.328	4.323	1	51384	12	>100:1			1000.00	1044.44	108.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.328	4.333	0/-1	54667	14	>100:1	Target = 1.02		1000.00	1081.11		
512 > 219	57	4.318	4.333		53742	14	>100:1	1.01 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.473	4.468	1	94673	15	>100:1			1000.00	1209.43	98.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.482	4.486	0/-1	95847	16	>100:1			1000.00	849.70		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.491	4.495	0	42635	14	>100:1			1000.00	1026.21	88.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.500	4.504	0/0	49254	15	>100:1	Target = 0.97		1000.00	1086.76		
526 > 219	59	4.500	4.504		51403	14	>100:1	0.95 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.518	4.513	1	623789	17	>100:1			1000.00	840.20	96.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.518	4.513	1/0	625098	17	>100:1	Target = 11.10		1000.00	989.31		
613 > 169	38	4.518	4.513		61098	16	>100:1	10.23 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.755	4.752	1/0	522065	19	>100:1	Target = 7.97		1000.00	1042.00		
663 > 169	38	4.755	4.752		67220	18	>100:1	7.76 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.980	4.964	1	850578	19	>100:1			1000.00	972.06	106.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.973	4.964	1/0	602585	18	91:1	Target = 11.40		1000.00	879.44		
713 > 169	42	4.980	4.964		56947	18	>100:1	10.58 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.364	5.343	2	822579	18	>100:1			1000.00	982.68	93.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.364	5.351	1/-1	511150	19	>100:1	Target = 10.50		1000.00	1039.93		
813 > 269	40	5.364	5.351		50987	18	>100:1	10.02 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.740	5.716	2/0	756400	23	83:1	Target = 13.22		1000.00	1009.07		
913 > 319	40	5.740	5.716		60328	34	>100:1	12.53 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.929	3.925	1	614535	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.450	0	556504	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.201	3.198	1	474815	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.717	0	463755	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.577	3.574	1	138481	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072721-DOD.b\072721051.d
Injection Date: 27-Jul-2021 22:40:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 44
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	557527	564717			101.3	50 - 150
8 PFBA			1000.00	939.45	93.9	70 - 130
D 50 13C5_PFPeA	527160	547185			103.8	50 - 150
21 PFPeA			1000.00	909.48	90.9	70 - 130
7 PFBS			884.00	789.90	89.4	70 - 130
D 44 13C3_PFBS	183413	190806			104	50 - 150
D 63 13C2_4:2 FTS_2	95364	86448			90.7	50 - 150
1 4:2 FTS			934.00	1012.79	108.4	70 - 130
D 49 13C5_PFHxA	616730	640003			103.8	50 - 150
15 PFHxA			1000.00	906.50	90.7	70 - 130
22 PFPeS			938.00	856.28	91.3	70 - 130
28 GenX			2000.00	1962.75	98.1	70 - 130
D 66 13C3_GenX	1195525	1100969			92.1	50 - 150
D 47 13C4_PFHpA	481010	505091			105	50 - 150
13 PFHpA			1000.00	908.97	90.9	70 - 130
D 45 13C3_PFHxS	142880	145460			101.8	50 - 150
14 PFHxS			910.00	855.94	94.1	70 - 130
29 ADONA			942.00	927.40	98.5	70 - 130
D 64 13C2_6:2 FTS_2	79681	80619			101.2	50 - 150
2 6:2 FTS			948.00	852.75	90	70 - 130
20 PFOA			1000.00	930.06	93	70 - 130
D 53 13C8_PFOA	512318	515939			100.7	50 - 150
12 PFHpS			952.00	982.88	103.2	70 - 130
18 PFOS			928.00	787.16	84.8	70 - 130
D 54 13C8_PFOS	150996	163435			108.2	50 - 150
17 PFNA			1000.00	928.59	92.9	70 - 130
D 56 13C9_PFNA	627858	637968			101.6	50 - 150
30 9Cl-PF3ONS			932.00	805.15	86.4	70 - 130
D 55 13C8_PFOSA	287887	291735			101.3	50 - 150
19 PFOSA			1000.00	965.95	96.6	70 - 130
16 PFNS			960.00	829.37	86.4	70 - 130
D 65 13C2_8:2 FTS_2	87630	87804			100.2	50 - 150
10 PFDA			1000.00	877.14	87.7	70 - 130
3 8:2 FTS			958.00	855.11	89.3	70 - 130
D 51 13C6_PFDA	589722	626577			106.2	50 - 150
D 58 d3-MeFOSAA	633858	719545			113.5	50 - 150

Report Date: 28-Jul-2021 17:54:27 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\072721-DOD.b\072721051.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	953.31	95.3	70 - 130
9 PFDS			964.00	764.09	79.3	70 - 130
D 52 13C7_PFUdA	612148	676939			110.6	50 - 150
25 PFUdA			1000.00	897.93	89.8	70 - 130
D 60 d5-EtFOSAA	607333	616238			101.5	50 - 150
5 N-EtFOSAA			1000.00	963.00	96.3	70 - 130
D 61 d7-MeFOSE	87856	82529			93.9	50 - 150
32 MeFOSE			1000.00	1013.64	101.4	70 - 130
D 57 d3-MeFOSA	47214	48319			102.3	50 - 150
26 MeFOSA			1000.00	1248.32	124.8	70 - 130
31 11Cl-PF3OUDS			942.00	786.51	83.5	70 - 130
D 62 d9-EtFOSE	96174	92436			96.1	50 - 150
33 EtFOSE			1000.00	901.91	90.2	70 - 130
D 59 d5-EtFOSA	48187	48399			100.4	50 - 150
27 EtFOSA			1000.00	1031.09	103.1	70 - 130
11 PFDoA			1000.00	898.47	89.8	70 - 130
D 38 13C2_PFDoA	647589	675123			104.3	50 - 150
4 10:2 FTS			964.00	681.99	70.7	70 - 130
34 PFDOS			968.00	890.89	92	70 - 130
24 PFTrDA			1000.00	1025.20	102.5	70 - 130
23 PFTeDA			1000.00	907.43	90.7	70 - 130
D 42 13C2_PFTeDA	797332	864717			108.5	50 - 150
D 40 13C2_PFHxDA	877076	860896			98.2	50 - 150
35 PFHxDA			1000.00	1037.80	103.8	70 - 130
36 PFODA			1000.00	1043.90	104.4	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072721-DOD.b\072721051.d
Injection Date: 27-Jul-2021 22:40:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 44
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.717	0	564717	20	>100:1			1000.00	1024.16	101.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.717	1.717	0/0	511570	21	>100:1			1000.00	939.45		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.087	2.087	0	547185	15	>100:1			1000.00	1059.74	103.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.087	2.087	0/0	528150	16	>100:1			1000.00	909.48		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.150	0	190806	15	>100:1			1000.00	1099.33	104	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.140	0/0	194869	15	>100:1	Target = 3.42		884.00	789.90		
298.9 > 99	44	2.140	2.140		57846	15	>100:1	3.36 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.486	2.486	1/1	152710	23	>100:1	Target = 2.97		938.00	856.28		
349 > 99	44	2.477	2.486		54173	23	>100:1	2.81 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.406	1	86448	17	>100:1			5000.00	4336.31	90.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.415	2.406	1/0	35375	16		Target = 1.63		934.00	1012.79		
327 > 81	63	2.415	2.406		18980	18	>100:1	1.86 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.450	1	640003	16	>100:1			1000.00	1061.24	103.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.450	1/0	593058	18	>100:1	Target = 18.20		1000.00	906.50		
313 > 119	49	2.450	2.450		30691	16	>100:1	19.32 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.566	2.566	1	1100969	18	>100:1			5000.00	5169.58	92.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.566	2.566	1/0	297588	18	>100:1	Target = 0.78		2000.00	1962.75		
285 > 185	66	2.566	2.566		407840	18	>100:1	0.72 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.817	2.826	0	505091	17	>100:1			1000.00	1041.46	105	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.817	2.826	0/0	514859	19	>100:1	Target = 3.72		1000.00	908.97		
363 > 169	47	2.826	2.826		136788	18	>100:1	3.76 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.835	1	145460	18	>100:1			1000.00	1047.36	101.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.835	1/0	133326	25	>100:1	Target = 3.04	0.17	910.00	855.94		
399 > 99	45	2.835	2.835		49759	23	>100:1	2.67 (1.52-4.56)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.863	1/0	841598	19	>100:1	Target = 3.02		942.00	927.40		
377 > 85	45	2.854	2.863		279377	18	>100:1	3.01 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.212	3.205	1/0	140222	19		Target = 3.10		952.00	982.88		
449 > 99	45	3.205	3.205		47718	22	>100:1	2.93 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.178	1	80619	22	>100:1			5000.00	5140.61	101.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.178	3.178	1/0	38780	27	>100:1	Target = 1.81		948.00	852.75		
427 > 81	64	3.178	3.178		21943	19		1.76 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.198	1	515939	22	>100:1			1000.00	1042.80	100.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.205	1/0	455591	19	>100:1	Target = 2.85		1000.00	930.06		
413 > 169	53	3.205	3.205		163688	21	>100:1	2.78 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.574	3.574	0	163435	19	>100:1			1000.00	1173.47	108.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.574	3.582	0/0	143857	36	>100:1	Target = 3.31	0.27	928.00	787.16		
499 > 99	54	3.574	3.582		42360	34		3.39 (1.65-4.96)	0.13				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.780	1/1	474510	19	>100:1			932.00	805.15		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.917	3.917	0/0	107979	16	>100:1	Target = 2.73		960.00	829.37		
549 > 99	54	3.925	3.917		38028	17	>100:1	2.83 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.221	4.221	1/1	95779	21	>100:1	Target = 2.65		964.00	764.09		
599 > 99	54	4.221	4.221		45210	15	>100:1	2.11 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.386	4.378	1/1	413690	17	>100:1			942.00	786.51		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.732	4.718	1/1	121967	17	>100:1	Target = 3.07		968.00	890.89		
699 > 99	54	4.732	4.718		39169	26	>100:1	3.11 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.574	1	637968	19	>100:1			1000.00	1047.24	101.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.582	3.582	0/-1	624126	18	>100:1	Target = 6.36		1000.00	928.59		
463 > 169	56	3.582	3.582		98242	19	>100:1	6.35 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.876	3.884	0	291735	20	>100:1			1000.00	1092.73	101.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.876	3.876	0/0	301048	17	>100:1	Target = 37.21		1000.00	965.95		
498>478	55	3.876	3.876		10749	20		28.00 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.925	3.917	1	87804	16	>100:1			5000.00	5187.49	100.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.925	3.917	1/0	34502	20	>100:1	Target = 1.87		958.00	855.11		
527 > 81	65	3.925	3.917		20688	21		1.66 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.531	4.513	2/1	49600	17	>100:1	Target = 3.27		964.00	681.99		
627 > 80	65	4.531	4.513		12136	22	>100:1	4.08 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.925	3.925	0	626577	18	>100:1			1000.00	1062.25	106.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.934	3.925	1/1	585766	19	>100:1	Target = 13.00		1000.00	877.14		
513 > 169	51	3.934	3.925		47667	18	>100:1	12.28 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.084	1	719545	16	>100:1			5000.00	5390.48	113.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.093	4.084	1/0	107197	30	>100:1	Target = 1.39	0.08	1000.00	953.31		M
570 > 483	58	4.093	4.084		82663	31	>100:1	1.29 (0.69-2.09)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.242	4.231	1	676939	17	>100:1			1000.00	1030.54	110.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.242	4.242	1/0	537661	16	>100:1	Target = 13.51		1000.00	897.93		
563 > 169	52	4.242	4.242		38638	13	>100:1	13.91 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.252	4.242	1	616238	15	>100:1			5000.00	5361.84	101.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.252	4.242	1/0	117760	30	>100:1	Target = 1.80	0.07	1000.00	963.00		M
584 > 526	60	4.252	4.242		79774	28	>100:1	1.47 (0.90-2.70)	0.12				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.302	4.302	0	82529	14	>100:1			1000.00	1098.66	93.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.312	4.312	0/0	95624	14	>100:1			1000.00	1013.64		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.323	4.323	0	48319	17	>100:1			1000.00	982.14	102.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.323	4.333	0/0	59357	13	>100:1	Target = 1.02		1000.00	1248.32		
512 > 219	57	4.323	4.333		49983	13	>100:1	1.18 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.468	4.468	1	92436	15	>100:1			1000.00	1180.85	96.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.477	4.486	0/-1	99333	14	>100:1			1000.00	901.91		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.486	4.495	0	48399	14	>100:1			1000.00	1164.94	100.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.495	4.504	0/0	53104	13	>100:1	Target = 0.97		1000.00	1031.09		
526 > 219	59	4.495	4.504		55968	15	>100:1	0.94 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.522	4.513	1	675123	16	>100:1			1000.00	909.35	104.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.522	4.513	1/0	614416	17	>100:1	Target = 11.10		1000.00	898.47		
613 > 169	38	4.513	4.513		66435	21	>100:1	9.24 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.759	4.752	1/0	555915	19	>100:1	Target = 7.97		1000.00	1025.20		
663 > 169	38	4.759	4.752		70828	20	>100:1	7.84 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.978	4.964	1	864717	18	>100:1			1000.00	988.22	108.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.978	4.964	1/0	632103	19	85:1	Target = 11.40		1000.00	907.43		
713 > 169	42	4.978	4.964		53298	17	>100:1	11.85 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.369	5.343	2	860896	17	>100:1			1000.00	1028.45	98.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.369	5.351	2/0	533865	17	93:1	Target = 10.50		1000.00	1037.80		
813 > 269	40	5.369	5.351		52688	17	>100:1	10.13 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.744	5.716	2/0	818965	23	73:1	Target = 13.22		1000.00	1043.90		
913 > 319	40	5.744	5.716		63102	23	>100:1	12.97 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.925	3.925	0	700365	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.450	1	609324	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.198	1	515108	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.717	1.717	0	484594	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.574	3.574	0	154251	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821005.d
Injection Date: 28-Jul-2021 12:35:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	546632			97.1	50 - 150
8 PFBA			100.00	106.07	106.1	70 - 130
D 50 13C5_PFPeA	523546	503885			96.2	50 - 150
21 PFPeA			100.00	99.807	99.8	70 - 130
7 PFBS			88.400	86.535	97.9	70 - 130
D 44 13C3_PFBS	169277	179569			106.1	50 - 150
D 63 13C2_4:2 FTS_2	90196	94243			104.5	50 - 150
1 4:2 FTS			93.400	82.174	88	70 - 130
D 49 13C5_PFHxA	600114	629624			104.9	50 - 150
15 PFHxA			100.00	97.024	97	70 - 130
22 PFPeS			93.800	101.63	108.3	70 - 130
28 GenX			200.00	209.53	104.8	70 - 130
D 66 13C3_GenX	1000599	1187852			118.7	50 - 150
D 47 13C4_PFHpA	482787	481492			99.7	50 - 150
13 PFHpA			100.00	110.72	110.7	70 - 130
D 45 13C3_PFHxS	137682	146388			106.3	50 - 150
14 PFHxS			91.000	99.394	109.2	70 - 130
29 ADONA			94.200	91.184	96.8	70 - 130
D 64 13C2_6:2 FTS_2	77321	82438			106.6	50 - 150
2 6:2 FTS			94.800	138.96	146.6	70 - 130
20 PFOA			100.00	105.05	105.1	70 - 130
D 53 13C8_PFOA	538966	470743			87.3	50 - 150
12 PFHpS			95.200	100.76	105.8	70 - 130
18 PFOS			92.800	89.095	96	70 - 130
D 54 13C8_PFOS	139992	144963			103.6	50 - 150
17 PFNA			100.00	107.95	108	70 - 130
D 56 13C9_PFNA	618881	590148			95.4	50 - 150
30 9Cl-PF3ONS			93.200	95.720	102.7	70 - 130
D 55 13C8_PFOSA	250019	308005			123.2	50 - 150
19 PFOSA			100.00	94.128	94.1	70 - 130
16 PFNS			96.000	98.737	102.9	70 - 130
D 65 13C2_8:2 FTS_2	72182	92140			127.6	50 - 150
10 PFDA			100.00	107.05	107.1	70 - 130
3 8:2 FTS			95.800	94.614	98.8	70 - 130
D 51 13C6_PFDA	590501	611283			103.5	50 - 150
D 58 d3-MeFOSAA	601725	685228			113.9	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	107.78	107.8	70 - 130
9 PFDS			96.400	82.676	85.8	70 - 130
D 52 13C7_PFUdA	707587	617181			87.2	50 - 150
25 PFUdA			100.00	109.36	109.4	70 - 130
D 60 d5-EtFOSAA	521292	639425			122.7	50 - 150
5 N-EtFOSAA			100.00	104.16	104.2	70 - 130
D 61 d7-MeFOSE	68295	82233			120.4	50 - 150
32 MeFOSE			100.00	101.17	101.2	70 - 130
D 57 d3-MeFOSA	40777	48879			119.9	50 - 150
26 MeFOSA			100.00	155.34	155.3	70 - 130
31 11Cl-PF3OUDS			94.200	86.050	91.3	70 - 130
D 62 d9-EtFOSE	68452	91569			133.8	50 - 150
33 EtFOSE			100.00	114.93	114.9	70 - 130
D 59 d5-EtFOSA	38025	46046			121.1	50 - 150
27 EtFOSA			100.00	129.09	129.1	70 - 130
11 PFDoA			100.00	101.65	101.6	70 - 130
D 38 13C2_PFDoA	745164	634813			85.2	50 - 150
4 10:2 FTS			96.400	59.041	61.2	70 - 130
34 PFDOS			96.800	106.64	110.2	70 - 130
24 PFTrDA			100.00	110.77	110.8	70 - 130
23 PFTeDA			100.00	104.62	104.6	70 - 130
D 42 13C2_PFTeDA	846373	795642			94	50 - 150
D 40 13C2_PFHxDA	768834	940962			122.4	50 - 150
35 PFHxDA			100.00	110.61	110.6	70 - 130
36 PFODA			100.00	101.33	101.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821005.d
Injection Date: 28-Jul-2021 12:35:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.712	1	546632	21	>100:1			1000.00	991.36	97.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.712	1/0	55908	19	48:1			100.00	106.07		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	1	503885	17	>100:1			1000.00	975.88	96.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	53373	16	89:1			100.00	99.807		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	179569	15	>100:1			1000.00	1034.59	106.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	20091	16	>100:1	Target = 3.42		88.400	86.535		
298.9 > 99	44	2.141	2.141		6186	12	69:1	3.24 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.487	2.487	2/1	17057	23	>100:1	Target = 2.97		93.800	101.63		
349 > 99	44	2.487	2.487		5569	14	71:1	3.06 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.416	2	94243	17	>100:1			5000.00	4727.31	104.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.416	2/0	3129	14	48:1	Target = 1.63		93.400	82.174		
327 > 81	63	2.416	2.416		2332	13	18:1	1.34 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.451	2	629624	17	>100:1			1000.00	1044.03	104.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.451	2.451	2/0	62446	17	>100:1	Target = 18.20		100.00	97.024		
313 > 119	49	2.460	2.451		4621	19	32:1	13.51 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.567	2.567	2	1187852	18	>100:1			5000.00	5577.53	118.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	2/0	34276	17	76:1	Target = 0.78		200.00	209.53		
285 > 185	66	2.567	2.575		42189	16	68:1	0.81 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.827	2	481492	18	>100:1			1000.00	992.80	99.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.827	2.827	2/0	59782	16	92:1	Target = 3.72		100.00	110.72		
363 > 169	47	2.827	2.827		15126	20	>100:1	3.95 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.846	2	146388	22	>100:1			1000.00	1054.05	106.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.846	0/-2	15581	22	82:1	Target = 3.04		91.000	99.394		M
399 > 99	45	2.846	2.846		5474	32	55:1	2.84 (1.52-4.56)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	2/0	83276	18	>100:1	Target = 3.02		94.200	91.184		
377 > 85	45	2.864	2.864		28371	18	>100:1	2.93 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.213	3.213	2/0	14467	20		Target = 3.10		95.200	100.76		
449 > 99	45	3.213	3.213		5251	17	48:1	2.75 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.187	3.187	2	82438	22	>100:1			5000.00	5256.60	106.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.187	3.187	2/0	6462	25	54:1	Target = 1.81		94.800	138.96		
427 > 81	64	3.187	3.187		3571	20	37:1	1.80 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.213	3.213	3	470743	22	>100:1			1000.00	951.45	87.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.207	3.207	2/-1	46953	20	33:1	Target = 2.85		100.00	105.05		
413 > 169	53	3.207	3.207		15916	19	75:1	2.95 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.584	3.584	2	144963	18	>100:1			1000.00	1040.84	103.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.584	3.584	2/0	16914	41	87:1	Target = 3.31	0.31	92.800	89.095		
499 > 99	54	3.584	3.584		4329	38	25:1	3.90 (1.65-4.96)	0.18				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.796	3.796	3/1	50036	23	>100:1			93.200	95.720		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.935	3.935	3/1	11402	21		Target = 2.73		96.000	98.737		
549 > 99	54	3.918	3.935		4974	23	38:1	2.29 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.235	4.235	3/1	9895	19	86:1	Target = 2.65		96.400	82.676		
599 > 99	54	4.245	4.235		5095	21	33:1	1.94 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.396	4.396	3/1	40145	17	>100:1			94.200	86.050		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.747	4.747	3/1	12949	18	>100:1	Target = 3.07		96.800	106.64		
699 > 99	54	4.740	4.747		3702	24	56:1	3.49 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.592	3.592	2	590148	19	>100:1			1000.00	968.74	95.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.592	3.592	2/0	67120	17	>100:1	Target = 6.36		100.00	107.95		
463 > 169	56	3.592	3.592		10851	16	75:1	6.18 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.885	3.885	2	308005	18	>100:1			1000.00	1153.67	123.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.885	3.885	2/0	30972	21	96:1	Target = 37.21		100.00	94.128		
498>478	55	3.885	3.885		710	14	10:1	43.62 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.935	3.935	3	92140	16	>100:1			5000.00	5443.66	127.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.935	3.935	3/0	4006	15	23:1	Target = 1.87		95.800	94.614		
527 > 81	65	3.935	3.935		3313	20		1.20 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.542	4.542	3/0	4506	21	29:1	Target = 3.27		96.400	59.041		
627 > 80	65	4.542	4.542		1406	17	11:1	3.20 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.943	3.943	3	611283	17	>100:1			1000.00	1036.33	103.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.943	3.943	3/0	69746	18	81:1	Target = 13.00		100.00	107.05		
513 > 169	51	3.943	3.943		4951	20	32:1	14.08 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.105	4.105	3	685228	18	>100:1			5000.00	5133.39	113.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.114	4.114	0/-3	11542	31	39:1	Target = 1.39	0.17	100.00	107.78		M
570 > 483	58	4.105	4.114		7972	27	25:1	1.44 (0.69-2.09)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.255	4.255	3	617181	15	>100:1			1000.00	939.57	87.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.255	4.255	3/0	59702	17	>100:1	Target = 13.51		100.00	109.36		
563 > 169	52	4.265	4.255		4274	14	17:1	13.96 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.255	4.255	3	639425	16	>100:1			5000.00	5563.59	122.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.265	4.265	0/-3	13216	20	98:1	Target = 1.80		100.00	104.16		M
584 > 526	60	4.255	4.265		7771	27		1.70 (0.90-2.70)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.306	4.306	1	82233	14	>100:1			1000.00	1094.72	120.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.326	4.326	1/0	9510	23	31:1			100.00	101.17		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.336	4.336	1	48879	14	>100:1			1000.00	993.52	119.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.336	4.336	1/0	7472	18	30:1	Target = 1.02		100.00	155.34		
512 > 219	57	4.326	4.336		4665	14		1.60 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.479	4.479	1	91569	15	>100:1			1000.00	1169.78	133.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.488	4.488	1/0	12539	15	>100:1			100.00	114.93		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.497	4.497	1	46046	14	>100:1			1000.00	1108.31	121.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.506	4.506	1/0	7229	13	51:1	Target = 0.97		100.00	129.09		
526 > 219	59	4.506	4.506		6482	14	47:1	1.11 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.533	4.533	3	634813	17	>100:1			1000.00	855.05	85.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.533	4.533	3/0	65362	17	31:1	Target = 11.10		100.00	101.65		
613 > 169	38	4.533	4.533		4622	19	40:1	14.14 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.774	4.774	4/1	56478	19	>100:1	Target = 7.97		100.00	110.77		
663 > 169	38	4.774	4.774		7816	28	>100:1	7.22 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.991	4.991	4	795642	19	>100:1			1000.00	909.28	94	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.991	4.991	4/0	67055	19	29:1	Target = 11.40		100.00	104.62		
713 > 169	42	4.991	4.991		5667	24	62:1	11.83 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.387	5.387	5	940962	18	>100:1			1000.00	1124.10	122.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.387	5.387	5/0	62190	16	12:1	Target = 10.50		100.00	110.61		
813 > 269	40	5.387	5.387		5311	17	>100:1	11.70 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.766	5.766	7/2	86890	23	>100:1	Target = 13.22		100.00	101.33		
913 > 319	40	5.759	5.766		6239	24	>100:1	13.92 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.943	3.943	3	669129	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.451	2	594124	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.213	3.213	3	509130	20	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.712	1	492584	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.584	3.584	2	141998	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821006.d
Injection Date: 28-Jul-2021 12:46:55 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	532713			97.5	50 - 150
8 PFBA			200.00	209.70	104.9	70 - 130
D 50 13C5_PFPeA	503885	506454			100.5	50 - 150
21 PFPeA			200.00	205.71	102.9	70 - 130
7 PFBS			176.80	167.24	94.6	70 - 130
D 44 13C3_PFBS	179569	173147			96.4	50 - 150
D 63 13C2_4:2 FTS_2	94243	92247			97.9	50 - 150
1 4:2 FTS			186.80	206.65	110.6	70 - 130
D 49 13C5_PFHxA	629624	592724			94.1	50 - 150
15 PFHxA			200.00	196.96	98.5	70 - 130
22 PFPeS			187.60	175.54	93.6	70 - 130
28 GenX			400.00	388.20	97	70 - 130
D 66 13C3_GenX	1187852	1201835			101.2	50 - 150
D 47 13C4_PFHpA	481492	478720			99.4	50 - 150
13 PFHpA			200.00	194.94	97.5	70 - 130
D 45 13C3_PFHxS	146388	146100			99.8	50 - 150
14 PFHxS			182.00	174.78	96	70 - 130
29 ADONA			188.40	203.53	108	70 - 130
D 64 13C2_6:2 FTS_2	82438	81726			99.1	50 - 150
2 6:2 FTS			189.60	242.08	127.7	70 - 130
20 PFOA			200.00	216.34	108.2	70 - 130
D 53 13C8_PFOA	470743	480954			102.2	50 - 150
12 PFHpS			190.40	181.59	95.4	70 - 130
18 PFOS			185.60	192.84	103.9	70 - 130
D 54 13C8_PFOS	144963	138675			95.7	50 - 150
17 PFNA			200.00	206.95	103.5	70 - 130
D 56 13C9_PFNA	590148	602400			102.1	50 - 150
30 9Cl-PF3ONS			186.40	202.35	108.6	70 - 130
D 55 13C8_PFOSA	308005	289138			93.9	50 - 150
19 PFOSA			200.00	192.38	96.2	70 - 130
16 PFNS			192.00	183.05	95.3	70 - 130
D 65 13C2_8:2 FTS_2	92140	80795			87.7	50 - 150
10 PFDA			200.00	218.74	109.4	70 - 130
3 8:2 FTS			191.60	188.51	98.4	70 - 130
D 51 13C6_PFDA	611283	584926			95.7	50 - 150
D 58 d3-MeFOSAA	685228	678804			99.1	50 - 150

Report Date: 29-Jul-2021 18:54:26 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	204.94	102.5	70 - 130
9 PFDS			192.80	188.66	97.9	70 - 130
D 52 13C7_PFUdA	617181	615913			99.8	50 - 150
25 PFUdA			200.00	220.01	110	70 - 130
D 60 d5-EtFOSAA	639425	665547			104.1	50 - 150
5 N-EtFOSAA			200.00	175.76	87.9	70 - 130
D 61 d7-MeFOSE	82233	83653			101.7	50 - 150
32 MeFOSE			200.00	166.69	83.3	70 - 130
D 57 d3-MeFOSA	48879	55116			112.8	50 - 150
26 MeFOSA			200.00	248.05	124	70 - 130
31 11Cl-PF3OUDS			188.40	190.21	101	70 - 130
D 62 d9-EtFOSE	91569	96548			105.4	50 - 150
33 EtFOSE			200.00	190.04	95	70 - 130
D 59 d5-EtFOSA	46046	46074			100.1	50 - 150
27 EtFOSA			200.00	189.84	94.9	70 - 130
11 PFDoA			200.00	215.77	107.9	70 - 130
D 38 13C2_PFDoA	634813	602536			94.9	50 - 150
4 10:2 FTS			192.80	124.16	64.4	70 - 130
34 PFDOS			193.60	204.87	105.8	70 - 130
24 PFTrDA			200.00	236.97	118.5	70 - 130
23 PFTeDA			200.00	207.18	103.6	70 - 130
D 42 13C2_PFTeDA	795642	780807			98.1	50 - 150
D 40 13C2_PFHxDA	940962	935974			99.5	50 - 150
35 PFHxDA			200.00	210.73	105.4	70 - 130
36 PFODA			200.00	198.88	99.4	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821006.d
Injection Date: 28-Jul-2021 12:46:55 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.712	1	532713	21	>100:1			1000.00	966.12	97.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.712	1/0	107722	19	>100:1			200.00	209.70		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	1	506454	15	>100:1			1000.00	980.86	100.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	110567	16	>100:1			200.00	205.71		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	173147	15	>100:1			1000.00	997.58	96.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	37440	14	>100:1	Target = 3.42		176.80	167.24		
298.9 > 99	44	2.152	2.141		12150	14	>100:1	3.08 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.487	2.487	1/0	28409	16		Target = 2.97		187.60	175.54		
349 > 99	44	2.496	2.487		10223	22	>100:1	2.77 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.416	1	92247	19	>100:1			5000.00	4627.19	97.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.416	1/0	7702	13	>100:1	Target = 1.63		186.80	206.65		M
327 > 81	63	2.425	2.416		5052	20	22:1	1.52 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.452	2.451	1	592724	18	>100:1			1000.00	982.85	94.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.461	2.451	1/0	119338	16	>100:1	Target = 18.20		200.00	196.96		
313 > 119	49	2.461	2.451		6998	16	52:1	17.05 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.567	1	1201835	18	>100:1			5000.00	5643.19	101.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	1/0	64250	18	>100:1	Target = 0.78		400.00	388.20		
285 > 185	66	2.568	2.575		87080	23	>100:1	0.73 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.828	2.827	1	478720	17	>100:1			1000.00	987.08	99.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.828	2.827	1/0	104652	17	>100:1	Target = 3.72		200.00	194.94		
363 > 169	47	2.828	2.827		30697	22	>100:1	3.40 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.846	1	146100	16	>100:1			1000.00	1051.97	99.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.846	1/0	27345	23	>100:1	Target = 3.04	0.18	182.00	174.78		
399 > 99	45	2.846	2.846		8890	26	100:1	3.07 (1.52-4.56)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/0	185510	18	>100:1	Target = 3.02		188.40	203.53		
377 > 85	45	2.864	2.864		57012	16	>100:1	3.25 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.221	3.213	1/0	26020	20	>100:1	Target = 3.10		190.40	181.59		
449 > 99	45	3.215	3.213		9227	17	>100:1	2.81 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.188	3.187	1	81726	21	>100:1			5000.00	5211.20	99.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.188	3.187	1/0	11160	26	>100:1	Target = 1.81		189.60	242.08		
427 > 81	64	3.181	3.187		6286	24	37:1	1.77 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.213	0	480954	22	>100:1			1000.00	972.09	102.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.215	3.207	1/1	98789	21	>100:1	Target = 2.85		200.00	216.34		
413 > 169	53	3.215	3.207		35419	20	>100:1	2.78 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.584	1	138675	18	>100:1			1000.00	995.69	95.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.584	1/0	31917	34	19:1	Target = 3.31	0.28	185.60	192.84		
499 > 99	54	3.585	3.584		10044	32	56:1	3.17 (1.65-4.96)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.799	3.796	1/0	101188	18	>100:1			186.40	202.35		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.929	3.935	0/-1	20221	21	>100:1	Target = 2.73		192.00	183.05		
549 > 99	54	3.938	3.935		7694	22	59:1	2.62 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.238	4.235	1/0	20634	21	92:1	Target = 2.65		192.80	188.66		
599 > 99	54	4.248	4.235		7806	12	45:1	2.64 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.399	4.396	1/0	84890	18	>100:1			188.40	190.21		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.749	4.747	1/0	23798	21		Target = 3.07		193.60	204.87		M
699 > 99	54	4.749	4.747		7507	22		3.17 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.593	3.592	1	602400	19	>100:1			1000.00	988.85	102.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.593	3.592	1/0	131344	18	>100:1	Target = 6.36		200.00	206.95		
463 > 169	56	3.593	3.592		18210	17	>100:1	7.21 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.888	3.885	1	289138	17				1000.00	1083.00	93.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.888	3.885	1/0	59424	19	>100:1	Target = 37.21		200.00	192.38		
498>478	55	3.880	3.885		2132	13		27.87 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.938	3.935	1	80795	17	>100:1			5000.00	4773.40	87.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.946	3.935	1/0	6999	23	41:1	Target = 1.87		191.60	188.51		
527 > 81	65	3.929	3.935		4527	18	17:1	1.54 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.545	4.542	1/0	8309	15	53:1	Target = 3.27		192.80	124.16		
627 > 80	65	4.545	4.542		3058	20	43:1	2.71 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.946	3.943	1	584926	17	>100:1			1000.00	991.64	95.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.946	3.943	1/0	136368	17	>100:1	Target = 13.00		200.00	218.74		
513 > 169	51	3.946	3.943		10064	23	53:1	13.55 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.099	4.105	0	678804	18	>100:1			5000.00	5085.27	99.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.108	4.114	0/0	21740	27	>100:1	Target = 1.39		200.00	204.94		M
570 > 483	58	4.108	4.114		16265	27	66:1	1.33 (0.69-2.09)	0.10				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.258	4.255	1	615913	15	>100:1			1000.00	937.64	99.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.258	4.255	1/0	119860	13	>100:1	Target = 13.51		200.00	220.01		M
563 > 169	52	4.258	4.255		5197	19	40:1	23.06 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.258	4.255	1	665547	15	>100:1			5000.00	5790.88	104.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.258	4.265	0/-1	23212	34	72:1	Target = 1.80	0.07	200.00	175.76		M
584 > 526	60	4.268	4.265		14916	28	>100:1	1.55 (0.90-2.70)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.308	4.306	1	83653	16	>100:1			1000.00	1113.62	101.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.329	4.326	1/0	15939	19	78:1			200.00	166.69		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.329	4.336	0	55116	13	>100:1			1000.00	1120.30	112.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.329	4.336	0/0	13454	15	95:1	Target = 1.02		200.00	248.05		
512 > 219	57	4.339	4.336		11483	21	49:1	1.17 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.473	4.479	0	96548	16	>100:1			1000.00	1233.38	105.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.491	4.488	1/1	21861	15	>100:1			200.00	190.04		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.500	4.497	1	46074	14	>100:1			1000.00	1108.98	100.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.509	4.506	1/0	10151	14	53:1	Target = 0.97		200.00	189.84		
526 > 219	59	4.509	4.506		10422	14	81:1	0.97 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.536	4.533	1	602536	17	>100:1			1000.00	811.58	94.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.527	4.533	0/-1	131689	15	35:1	Target = 11.10		200.00	215.77		
613 > 169	38	4.536	4.533		12616	15	87:1	10.43 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.776	4.774	1/0	114683	20	>100:1	Target = 7.97		200.00	236.97		
663 > 169	38	4.769	4.774		14976	23	>100:1	7.65 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.992	4.991	1	780807	19	>100:1			1000.00	892.33	98.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.992	4.991	1/0	130312	19	16:1	Target = 11.40		200.00	207.18		
713 > 169	42	4.992	4.991		12366	29	>100:1	10.53 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.387	1	935974	17	>100:1			1000.00	1118.14	99.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.390	5.387	1/0	117855	17	20:1	Target = 10.50		200.00	210.73		
813 > 269	40	5.390	5.387		11248	17	>100:1	10.47 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.768	5.766	1/0	169635	23	12:1	Target = 13.22		200.00	198.88		
913 > 319	40	5.768	5.766		12352	24	>100:1	13.73 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.946	3.943	1	681660	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.461	2.451	1	579463	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.215	3.213	1	494984	20	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.712	1	490195	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.584	1	141951	18							

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821020.d
Injection Date: 28-Jul-2021 15:18:39 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 13
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	537206			98.3	50 - 150
8 PFBA			1000.00	913.62	91.4	70 - 130
D 50 13C5_PFPeA	503885	504020			100	50 - 150
21 PFPeA			1000.00	876.21	87.6	70 - 130
7 PFBS			884.00	774.61	87.6	70 - 130
D 44 13C3_PFBS	179569	182176			101.5	50 - 150
D 63 13C2_4:2 FTS_2	94243	72781			77.2	50 - 150
1 4:2 FTS			934.00	1114.80	119.4	70 - 130
D 49 13C5_PFHxA	629624	614275			97.6	50 - 150
15 PFHxA			1000.00	857.51	85.8	70 - 130
22 PFPeS			938.00	875.66	93.4	70 - 130
28 GenX			2000.00	2027.42	101.4	70 - 130
D 66 13C3_GenX	1187852	1062616			89.5	50 - 150
D 47 13C4_PFHpA	481492	461489			95.8	50 - 150
13 PFHpA			1000.00	921.59	92.2	70 - 130
D 45 13C3_PFHxS	146388	141652			96.8	50 - 150
14 PFHxS			910.00	849.46	93.3	70 - 130
29 ADONA			942.00	897.10	95.2	70 - 130
D 64 13C2_6:2 FTS_2	82438	78305			95	50 - 150
2 6:2 FTS			948.00	793.26	83.7	70 - 130
20 PFOA			1000.00	961.19	96.1	70 - 130
D 53 13C8_PFOA	470743	481448			102.3	50 - 150
12 PFHpS			952.00	963.52	101.2	70 - 130
18 PFOS			928.00	874.93	94.3	70 - 130
D 54 13C8_PFOS	144963	143465			99	50 - 150
17 PFNA			1000.00	887.59	88.8	70 - 130
D 56 13C9_PFNA	590148	624997			105.9	50 - 150
30 9Cl-PF3ONS			932.00	882.55	94.7	70 - 130
D 55 13C8_PFOSA	308005	259561			84.3	50 - 150
19 PFOSA			1000.00	994.11	99.4	70 - 130
16 PFNS			960.00	880.34	91.7	70 - 130
D 65 13C2_8:2 FTS_2	92140	80829			87.7	50 - 150
10 PFDA			1000.00	977.88	97.8	70 - 130
3 8:2 FTS			958.00	871.34	91	70 - 130
D 51 13C6_PFDA	611283	587218			96.1	50 - 150
D 58 d3-MeFOSAA	685228	642514			93.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1061.22	106.1	70 - 130
9 PFDS			964.00	853.29	88.5	70 - 130
D 52 13C7_PFUdA	617181	651512			105.6	50 - 150
25 PFUdA			1000.00	884.22	88.4	70 - 130
D 60 d5-EtFOSAA	639425	612730			95.8	50 - 150
5 N-EtFOSAA			1000.00	1073.91	107.4	70 - 130
D 61 d7-MeFOSE	82233	79731			97	50 - 150
32 MeFOSE			1000.00	1023.81	102.4	70 - 130
D 57 d3-MeFOSA	48879	53918			110.3	50 - 150
26 MeFOSA			1000.00	1014.86	101.5	70 - 130
31 11Cl-PF3OUDS			942.00	848.83	90.1	70 - 130
D 62 d9-EtFOSE	91569	82839			90.5	50 - 150
33 EtFOSE			1000.00	987.52	98.8	70 - 130
D 59 d5-EtFOSA	46046	46326			100.6	50 - 150
27 EtFOSA			1000.00	975.21	97.5	70 - 130
11 PFDoA			1000.00	950.45	95	70 - 130
D 38 13C2_PFDoA	634813	606075			95.5	50 - 150
4 10:2 FTS			964.00	607.41	63	70 - 130
34 PFDOS			968.00	971.90	100.4	70 - 130
24 PFTrDA			1000.00	1045.86	104.6	70 - 130
23 PFTeDA			1000.00	891.80	89.2	70 - 130
D 42 13C2_PFTeDA	795642	809980			101.8	50 - 150
D 40 13C2_PFHxDA	940962	813603			86.5	50 - 150
35 PFHxDA			1000.00	1053.14	105.3	70 - 130
36 PFODA			1000.00	1033.85	103.4	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821020.d
Injection Date: 28-Jul-2021 15:18:39 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 13
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.709	1.712	0	537206	21	>100:1			1000.00	974.27	98.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.712	1/1	473271	20	>100:1			1000.00	913.62		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.083	2.088	0	504020	17	>100:1			1000.00	976.14	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.083	2.088	0/0	468688	14	>100:1			1000.00	876.21		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.136	2.141	0	182176	15	>100:1			1000.00	1049.61	101.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.146	2.141	1/1	182455	15	>100:1	Target = 3.42		884.00	774.61		
298.9 > 99	44	2.146	2.141		54570	15	>100:1	3.34 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.486	2.487	0/0	149102	16	>100:1	Target = 2.97		938.00	875.66		
349 > 99	44	2.486	2.487		45620	18	>100:1	3.26 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.414	2.416	0	72781	18	>100:1			5000.00	3650.76	77.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.414	2.416	0/0	32782	16		Target = 1.63		934.00	1114.80		
327 > 81	63	2.406	2.416		18233	18	>100:1	1.79 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.451	0	614275	16	>100:1			1000.00	1018.58	97.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.451	0/0	538451	18	>100:1	Target = 18.20		1000.00	857.51		
313 > 119	49	2.450	2.451		27784	16	>100:1	19.37 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.566	2.567	0	1062616	17	>100:1			5000.00	4989.49	89.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.566	2.575	0/0	296686	18	>100:1	Target = 0.78		2000.00	2027.42		
285 > 185	66	2.566	2.575		368090	17	>100:1	0.80 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.817	2.827	0	461489	18	>100:1			1000.00	951.55	95.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.826	2.827	0/0	476947	18	>100:1	Target = 3.72		1000.00	921.59		
363 > 169	47	2.826	2.827		127343	17	>100:1	3.74 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.846	0	141652	17	>100:1			1000.00	1019.95	96.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.846	0/0	128853	25	>100:1	Target = 3.04	0.18	910.00	849.46		
399 > 99	45	2.835	2.846		40133	24	>100:1	3.21 (1.52-4.56)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.864	0/0	792788	17	>100:1	Target = 3.02		942.00	897.10		
377 > 85	45	2.863	2.864		246396	18	>100:1	3.21 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.212	3.213	0/0	133862	22	>100:1	Target = 3.10		952.00	963.52		
449 > 99	45	3.212	3.213		44864	26	>100:1	2.98 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.187	0	78305	21				5000.00	4993.06	95	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.178	3.187	0/0	35039	21	>100:1	Target = 1.81		948.00	793.26		
427 > 81	64	3.178	3.187		17861	20	>100:1	1.96 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.213	0	481448	22	>100:1			1000.00	973.09	102.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.207	0/0	439367	21	>100:1	Target = 2.85		1000.00	961.19		
413 > 169	53	3.205	3.207		158525	27	>100:1	2.77 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.574	3.584	0	143465	16	>100:1			1000.00	1030.08	99	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.584	0/0	140052	35	>100:1	Target = 3.31	0.27	928.00	874.93		
499 > 99	54	3.574	3.584		40581	36	>100:1	3.45 (1.65-4.96)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.796	0/0	456571	19	>100:1			932.00	882.55		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.925	3.935	0/0	100610	17	>100:1	Target = 2.73		960.00	880.34		
549 > 99	54	3.917	3.935		38983	16	>100:1	2.58 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.231	4.235	0/0	93800	15	>100:1	Target = 2.65		964.00	853.29		
599 > 99	54	4.231	4.235		37667	17	>100:1	2.49 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.386	4.396	0/0	391914	17	>100:1			942.00	848.83		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.738	4.747	0/0	116799	19	>100:1	Target = 3.07		968.00	971.90		
699 > 99	54	4.738	4.747		39370	20	>100:1	2.96 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.592	0	624997	19	>100:1			1000.00	1025.94	105.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.582	3.592	0/0	584441	20	>100:1	Target = 6.36		1000.00	887.59		
463 > 169	56	3.582	3.592		92969	22	>100:1	6.28 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.876	3.885	0	259561	16	>100:1			1000.00	972.21	84.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.876	3.885	0/0	275655	17	>100:1	Target = 37.21		1000.00	994.11		
498>478	55	3.876	3.885		9773	15		28.20 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.934	3.935	0	80829	18				5000.00	4775.41	87.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.925	3.935	0/0	32364	16	>100:1	Target = 1.87		958.00	871.34		
527 > 81	65	3.925	3.935		14027	23	>100:1	2.30 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.531	4.542	0/0	40667	15	>100:1	Target = 3.27		964.00	607.41		
627 > 80	65	4.531	4.542		14021	22	54:1	2.90 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.943	0	587218	16	>100:1			1000.00	995.53	96.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.934	3.943	0/0	612022	18	>100:1	Target = 13.00		1000.00	977.88		
513 > 169	51	3.934	3.943		40572	23	>100:1	15.08 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.105	0	642514	18	>100:1			5000.00	4813.40	93.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.093	4.114	-1/-1	106556	30		Target = 1.39		1000.00	1061.22		M
570 > 483	58	4.093	4.114		79635	32	>100:1	1.33 (0.69-2.09)	0.28				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.242	4.255	0	651512	17	>100:1			1000.00	991.83	105.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.252	4.255	0/0	509563	15	>100:1	Target = 13.51		1000.00	884.22		
563 > 169	52	4.252	4.255		39127	15	>100:1	13.02 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.252	4.255	0	612730	15	>100:1			5000.00	5331.32	95.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.262	4.265	0/0	130575	30	>100:1	Target = 1.80	0.11	1000.00	1073.91		M
584 > 526	60	4.252	4.265		76139	30		1.71 (0.90-2.70)	0.18				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.302	4.306	0	79731	15	>100:1			1000.00	1061.41	97	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.312	4.326	0/0	93309	15	>100:1			1000.00	1023.81		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.322	4.336	0	53918	13	>100:1			1000.00	1095.95	110.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.322	4.336	0/0	53848	15	>100:1	Target = 1.02		1000.00	1014.86		
512 > 219	57	4.322	4.336		49713	13	>100:1	1.08 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.468	4.479	0	82839	15	>100:1			1000.00	1058.25	90.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.477	4.488	0/0	97470	16	>100:1			1000.00	987.52		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.495	4.497	0	46326	21	>100:1			1000.00	1115.05	100.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.495	4.506	0/0	48131	16	>100:1	Target = 0.97		1000.00	975.21		
526 > 219	59	4.495	4.506		53184	20	>100:1	0.90 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.522	4.533	0	606075	16	>100:1			1000.00	816.34	95.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.522	4.533	0/0	583491	18	>100:1	Target = 11.10		1000.00	950.45		
613 > 169	38	4.522	4.533		51635	14	>100:1	11.30 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.765	4.774	0/0	509117	21	>100:1	Target = 7.97		1000.00	1045.86		
663 > 169	38	4.765	4.774		65518	18	>100:1	7.77 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.984	4.991	0	809980	19	>100:1			1000.00	925.67	101.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.984	4.991	0/0	581889	19	82:1	Target = 11.40		1000.00	891.80		
713 > 169	42	4.984	4.991		51272	18	>100:1	11.34 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.377	5.387	0	813603	17	>100:1			1000.00	971.95	86.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.377	5.387	0/0	511996	18	77:1	Target = 10.50		1000.00	1053.14		
813 > 269	40	5.377	5.387		52098	19	>100:1	9.82 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.758	5.766	0/0	766520	24	69:1	Target = 13.22		1000.00	1033.85		
913 > 319	40	5.751	5.766		59682	23	>100:1	12.84 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.934	3.943	0	598909	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.451	0	558321	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.213	0	483448	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.709	1.712	0	461359	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.584	0	138708	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821033.d
Injection Date: 28-Jul-2021 17:36:43 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 26
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	545149			99.7	50 - 150
8 PFBA			1000.00	971.01	97.1	70 - 130
D 50 13C5_PFPeA	503885	523750			103.9	50 - 150
21 PFPeA			1000.00	901.15	90.1	70 - 130
7 PFBS			884.00	779.30	88.2	70 - 130
D 44 13C3_PFBS	179569	188474			105	50 - 150
D 63 13C2_4:2 FTS_2	94243	83272			88.4	50 - 150
1 4:2 FTS			934.00	877.37	93.9	70 - 130
D 49 13C5_PFHxA	629624	605375			96.1	50 - 150
15 PFHxA			1000.00	894.52	89.5	70 - 130
22 PFPeS			938.00	804.47	85.8	70 - 130
28 GenX			2000.00	2019.49	101	70 - 130
D 66 13C3_GenX	1187852	1077187			90.7	50 - 150
D 47 13C4_PFHpA	481492	507047			105.3	50 - 150
13 PFHpA			1000.00	855.84	85.6	70 - 130
D 45 13C3_PFHxS	146388	153046			104.5	50 - 150
14 PFHxS			910.00	809.61	89	70 - 130
29 ADONA			942.00	816.31	86.7	70 - 130
D 64 13C2_6:2 FTS_2	82438	77999			94.6	50 - 150
2 6:2 FTS			948.00	780.78	82.4	70 - 130
20 PFOA			1000.00	948.39	94.8	70 - 130
D 53 13C8_PFOA	470743	484657			103	50 - 150
12 PFHpS			952.00	878.21	92.2	70 - 130
18 PFOS			928.00	799.33	86.1	70 - 130
D 54 13C8_PFOS	144963	149391			103.1	50 - 150
17 PFNA			1000.00	935.11	93.5	70 - 130
D 56 13C9_PFNA	590148	619880			105	50 - 150
30 9Cl-PF3ONS			932.00	885.73	95	70 - 130
D 55 13C8_PFOSA	308005	285372			92.7	50 - 150
19 PFOSA			1000.00	999.93	100	70 - 130
16 PFNS			960.00	956.75	99.7	70 - 130
D 65 13C2_8:2 FTS_2	92140	81699			88.7	50 - 150
10 PFDA			1000.00	925.82	92.6	70 - 130
3 8:2 FTS			958.00	969.75	101.2	70 - 130
D 51 13C6_PFDA	611283	610453			99.9	50 - 150
D 58 d3-MeFOSAA	685228	658321			96.1	50 - 150

Report Date: 29-Jul-2021 18:54:42 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\072821-DOD.b\072821033.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1049.15	104.9	70 - 130
9 PFDS			964.00	900.43	93.4	70 - 130
D 52 13C7_PFUdA	617181	660939			107.1	50 - 150
25 PFUdA			1000.00	916.37	91.6	70 - 130
D 60 d5-EtFOSAA	639425	631092			98.7	50 - 150
5 N-EtFOSAA			1000.00	1007.20	100.7	70 - 130
D 61 d7-MeFOSE	82233	80139			97.5	50 - 150
32 MeFOSE			1000.00	1092.62	109.3	70 - 130
D 57 d3-MeFOSA	48879	49134			100.5	50 - 150
26 MeFOSA			1000.00	1184.64	118.5	70 - 130
31 11Cl-PF3OUDS			942.00	863.21	91.6	70 - 130
D 62 d9-EtFOSE	91569	96370			105.2	50 - 150
33 EtFOSE			1000.00	913.45	91.3	70 - 130
D 59 d5-EtFOSA	46046	42954			93.3	50 - 150
27 EtFOSA			1000.00	1117.98	111.8	70 - 130
11 PFDoA			1000.00	988.89	98.9	70 - 130
D 38 13C2_PFDoA	634813	630434			99.3	50 - 150
4 10:2 FTS			964.00	638.82	66.3	70 - 130
34 PFDOS			968.00	949.67	98.1	70 - 130
24 PFTrDA			1000.00	1036.97	103.7	70 - 130
23 PFTeDA			1000.00	883.81	88.4	70 - 130
D 42 13C2_PFTeDA	795642	828717			104.2	50 - 150
D 40 13C2_PFHxDA	940962	870336			92.5	50 - 150
35 PFHxDA			1000.00	1032.48	103.2	70 - 130
36 PFODA			1000.00	986.11	98.6	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821033.d
Injection Date: 28-Jul-2021 17:36:43 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 26
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.712	0	545149	20	>100:1			1000.00	988.67	99.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.712	0/0	510438	20	>100:1			1000.00	971.01		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	0	523750	17	>100:1			1000.00	1014.36	103.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	0/0	500899	14	>100:1			1000.00	901.15		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	0	188474	16	>100:1			1000.00	1085.89	105	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	0/0	189905	15	>100:1	Target = 3.42		884.00	779.30		
298.9 > 99	44	2.141	2.141		57722	15	>100:1	3.28 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.487	2.487	0/0	141716	18	>100:1	Target = 2.97		938.00	804.47		
349 > 99	44	2.487	2.487		55900	17	>100:1	2.53 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.416	0	83272	17	>100:1			5000.00	4177.00	88.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.416	0/0	29519	23	>100:1	Target = 1.63		934.00	877.37		
327 > 81	63	2.407	2.416		17459	15	>100:1	1.69 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.451	0	605375	17	>100:1			1000.00	1003.82	96.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.451	2.451	0/0	553553	17	>100:1	Target = 18.20		1000.00	894.52		
313 > 119	49	2.451	2.451		27783	16	>100:1	19.92 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.567	2.567	0	1077187	17	>100:1			5000.00	5057.91	90.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.575	0/0	299577	19	>100:1	Target = 0.78		2000.00	2019.49		
285 > 185	66	2.567	2.575		360857	17	>100:1	0.83 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.827	0	507047	18	>100:1			1000.00	1045.49	105.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.827	2.827	0/0	486643	16	>100:1	Target = 3.72		1000.00	855.84		
363 > 169	47	2.827	2.827		140700	17	>100:1	3.45 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.846	0	153046	16	>100:1			1000.00	1101.99	104.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.846	0/0	132686	26	>100:1	Target = 3.04	0.18	910.00	809.61		
399 > 99	45	2.836	2.846		47771	23	>100:1	2.77 (1.52-4.56)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	0/0	779424	18	>100:1	Target = 3.02		942.00	816.31		
377 > 85	45	2.864	2.864		269445	18	>100:1	2.89 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.214	3.213	1/1	131824	21	>100:1	Target = 3.10		952.00	878.21		
449 > 99	45	3.214	3.213		45736	26	>100:1	2.88 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.188	3.187	1	77999	19	>100:1			5000.00	4973.55	94.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.187	0/-1	34353	18	>100:1	Target = 1.81		948.00	780.78		
427 > 81	64	3.188	3.187		17905	20	>100:1	1.91 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.213	0	484657	22	>100:1			1000.00	979.58	103	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.207	1/1	436403	21	>100:1	Target = 2.85		1000.00	948.39		
413 > 169	53	3.208	3.207		158636	22	>100:1	2.75 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.584	1	149391	17	>100:1			1000.00	1072.63	103.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.584	1/0	133484	35	>100:1	Target = 3.31	0.28	928.00	799.33		
499 > 99	54	3.585	3.584		43113	33	>100:1	3.09 (1.65-4.96)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.791	3.796	0/-1	477141	18	>100:1			932.00	885.73		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.929	3.935	0/-1	113859	18	>100:1	Target = 2.73		960.00	956.75		
549 > 99	54	3.929	3.935		40856	15	>100:1	2.78 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.235	1/0	103026	16	>100:1	Target = 2.65		964.00	900.43		
599 > 99	54	4.237	4.235		39286	14		2.62 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.391	4.396	0/-1	415015	17	>100:1			942.00	863.21		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.742	4.747	0/-1	118842	19	>100:1	Target = 3.07		968.00	949.67		
699 > 99	54	4.742	4.747		38433	18	>100:1	3.09 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.592	0	619880	17	>100:1			1000.00	1017.54	105	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.585	3.592	0/0	610689	20	>100:1	Target = 6.36		1000.00	935.11		
463 > 169	56	3.585	3.592		97442	17	>100:1	6.26 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.880	3.885	0	285372	18	>100:1			1000.00	1068.89	92.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.880	3.885	0/0	304842	18	>100:1	Target = 37.21		1000.00	999.93		
498>478	55	3.880	3.885		9699	20		31.43 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.929	3.935	0	81699	19	>100:1			5000.00	4826.81	88.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.929	3.935	0/0	36407	18	>100:1	Target = 1.87		958.00	969.75		
527 > 81	65	3.937	3.935		17328	22		2.10 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.536	4.542	0/0	43230	19		Target = 3.27		964.00	638.82		
627 > 80	65	4.536	4.542		12361	14	49:1	3.49 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.937	3.943	0	610453	17	>100:1			1000.00	1034.92	99.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.937	3.943	0/0	602369	18	>100:1	Target = 13.00		1000.00	925.82		
513 > 169	51	3.937	3.943		53577	18	>100:1	11.24 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.105	0	658321	17	>100:1			5000.00	4931.82	96.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.098	4.114	0/0	107935	31		Target = 1.39	0.08	1000.00	1049.15		M
570 > 483	58	4.098	4.114		76306	30	>100:1	1.41 (0.69-2.09)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.248	4.255	0	660939	16				1000.00	1006.19	107.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.258	4.255	1/1	535732	16	>100:1	Target = 13.51		1000.00	916.37		
563 > 169	52	4.258	4.255		40206	15	>100:1	13.32 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.258	4.255	1	631092	15	>100:1			5000.00	5491.09	98.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.258	4.265	0/-1	126134	35		Target = 1.80		1000.00	1007.20		M
584 > 526	60	4.258	4.265		75176	31	>100:1	1.67 (0.90-2.70)	0.08				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.308	4.306	1	80139	13	>100:1			1000.00	1066.84	97.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.318	4.326	0/-1	100090	20	>100:1			1000.00	1092.62		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.328	4.336	0	49134	15	>100:1			1000.00	998.71	100.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.328	4.336	0/0	57279	14	>100:1	Target = 1.02		1000.00	1184.64		
512 > 219	57	4.328	4.336		52344	13	>100:1	1.09 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.473	4.479	0	96370	15	>100:1			1000.00	1231.11	105.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.482	4.488	0/0	104885	15	>100:1			1000.00	913.45		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.491	4.497	0	42954	15	91:1			1000.00	1033.89	93.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.500	4.506	0/0	51020	14	>100:1	Target = 0.97		1000.00	1117.98		
526 > 219	59	4.500	4.506		50102	15	>100:1	1.01 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.527	4.533	0	630434	16	>100:1			1000.00	849.15	99.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.527	4.533	0/0	631487	16	>100:1	Target = 11.10		1000.00	988.89		
613 > 169	38	4.527	4.533		55156	17	>100:1	11.44 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.769	4.774	0/0	525081	20	>100:1	Target = 7.97		1000.00	1036.97		
663 > 169	38	4.769	4.774		63717	19	>100:1	8.24 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.988	4.991	0	828717	19	>100:1			1000.00	947.08	104.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.988	4.991	0/0	590015	21	87:1	Target = 11.40		1000.00	883.81		
713 > 169	42	4.988	4.991		54896	19	>100:1	10.74 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.384	5.387	0	870336	17	>100:1			1000.00	1039.73	92.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.384	5.387	0/0	536949	18	95:1	Target = 10.50		1000.00	1032.48		
813 > 269	40	5.384	5.387		51635	17	>100:1	10.39 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.764	5.766	0/0	782111	23	65:1	Target = 13.22		1000.00	986.11		
913 > 319	40	5.757	5.766		60576	22	>100:1	12.91 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.937	3.943	0	665169	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.451	0	567685	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.213	0	482024	21							

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.712	0	483792	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.584	1	147438	23	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821044.d
Injection Date: 28-Jul-2021 19:33:41 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 37
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	552865			101.1	50 - 150
8 PFBA			1000.00	934.48	93.4	70 - 130
D 50 13C5_PFPeA	503885	536769			106.5	50 - 150
21 PFPeA			1000.00	941.28	94.1	70 - 130
7 PFBS			884.00	782.86	88.6	70 - 130
D 44 13C3_PFBS	179569	192235			107.1	50 - 150
D 63 13C2_4:2 FTS_2	94243	82169			87.2	50 - 150
1 4:2 FTS			934.00	1081.11	115.8	70 - 130
D 49 13C5_PFHxA	629624	619247			98.4	50 - 150
15 PFHxA			1000.00	899.50	90	70 - 130
22 PFPeS			938.00	767.43	81.8	70 - 130
28 GenX			2000.00	2054.98	102.7	70 - 130
D 66 13C3_GenX	1187852	1042789			87.8	50 - 150
D 47 13C4_PFHpA	481492	511172			106.2	50 - 150
13 PFHpA			1000.00	884.17	88.4	70 - 130
D 45 13C3_PFHxS	146388	157053			107.3	50 - 150
14 PFHxS			910.00	813.24	89.4	70 - 130
29 ADONA			942.00	782.91	83.1	70 - 130
D 64 13C2_6:2 FTS_2	82438	71868			87.2	50 - 150
2 6:2 FTS			948.00	966.28	101.9	70 - 130
20 PFOA			1000.00	875.16	87.5	70 - 130
D 53 13C8_PFOA	470743	505594			107.4	50 - 150
12 PFHpS			952.00	897.95	94.3	70 - 130
18 PFOS			928.00	821.20	88.5	70 - 130
D 54 13C8_PFOS	144963	154974			106.9	50 - 150
17 PFNA			1000.00	971.06	97.1	70 - 130
D 56 13C9_PFNA	590148	627173			106.3	50 - 150
30 9Cl-PF3ONS			932.00	872.21	93.6	70 - 130
D 55 13C8_PFOSA	308005	289452			94	50 - 150
19 PFOSA			1000.00	956.88	95.7	70 - 130
16 PFNS			960.00	900.45	93.8	70 - 130
D 65 13C2_8:2 FTS_2	92140	81466			88.4	50 - 150
10 PFDA			1000.00	925.43	92.5	70 - 130
3 8:2 FTS			958.00	867.81	90.6	70 - 130
D 51 13C6_PFDA	611283	622283			101.8	50 - 150
D 58 d3-MeFOSAA	685228	700845			102.3	50 - 150

Report Date: 29-Jul-2021 18:54:50 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\072821-DOD.b\072821044.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	985.82	98.6	70 - 130
9 PFDS			964.00	955.88	99.2	70 - 130
D 52 13C7_PFUdA	617181	675454			109.4	50 - 150
25 PFUdA			1000.00	930.24	93	70 - 130
D 60 d5-EtFOSAA	639425	639445			100	50 - 150
5 N-EtFOSAA			1000.00	918.02	91.8	70 - 130
D 61 d7-MeFOSE	82233	89728			109.1	50 - 150
32 MeFOSE			1000.00	962.59	96.3	70 - 130
D 57 d3-MeFOSA	48879	54203			110.9	50 - 150
26 MeFOSA			1000.00	1097.59	109.8	70 - 130
31 11Cl-PF3OUDS			942.00	861.40	91.4	70 - 130
D 62 d9-EtFOSE	91569	93460			102.1	50 - 150
33 EtFOSE			1000.00	1007.66	100.8	70 - 130
D 59 d5-EtFOSA	46046	47531			103.2	50 - 150
27 EtFOSA			1000.00	1052.33	105.2	70 - 130
11 PFDoA			1000.00	974.64	97.5	70 - 130
D 38 13C2_PFDoA	634813	661644			104.2	50 - 150
4 10:2 FTS			964.00	629.84	65.3	70 - 130
34 PFDOS			968.00	874.45	90.3	70 - 130
24 PFTrDA			1000.00	1067.84	106.8	70 - 130
23 PFTeDA			1000.00	893.23	89.3	70 - 130
D 42 13C2_PFTeDA	795642	870328			109.4	50 - 150
D 40 13C2_PFHxDA	940962	902003			95.9	50 - 150
35 PFHxDA			1000.00	1041.78	104.2	70 - 130
36 PFODA			1000.00	1002.51	100.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821044.d
Injection Date: 28-Jul-2021 19:33:41 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 37
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.710	1.712	0	552865	20	>100:1			1000.00	1002.67	101.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.717	1.712	1/1	498188	19	>100:1			1000.00	934.48		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.087	2.088	0	536769	16	>100:1			1000.00	1039.57	106.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.087	2.088	0/0	536213	15	>100:1			1000.00	941.28		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.141	0	192235	15	>100:1			1000.00	1107.56	107.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.141	0/0	194578	15	>100:1	Target = 3.42		884.00	782.86		
298.9 > 99	44	2.140	2.141		57888	14	>100:1	3.36 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.486	2.487	0/0	137888	16	>100:1	Target = 2.97		938.00	767.43		
349 > 99	44	2.486	2.487		49988	16	>100:1	2.75 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.416	0	82169	16	>100:1			5000.00	4121.67	87.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.415	2.416	0/0	35892	18		Target = 1.63		934.00	1081.11		
327 > 81	63	2.415	2.416		19340	19	>100:1	1.85 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.451	0	619247	17	>100:1			1000.00	1026.83	98.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.451	0/0	569394	18	>100:1	Target = 18.20		1000.00	899.50		
313 > 119	49	2.450	2.451		30536	16	>100:1	18.64 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.566	2.567	0	1042789	17	>100:1			5000.00	4896.39	87.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.566	2.575	0/0	295107	18	>100:1	Target = 0.78		2000.00	2054.98		
285 > 185	66	2.566	2.575		375563	18	>100:1	0.78 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.827	0	511172	17	>100:1			1000.00	1054.00	106.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.826	2.827	0/0	506840	17	>100:1	Target = 3.72		1000.00	884.17		
363 > 169	47	2.826	2.827		136921	17	>100:1	3.70 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.846	0	157053	17	>100:1			1000.00	1130.84	107.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.844	2.846	0/0	136772	24	>100:1	Target = 3.04	0.17	910.00	813.24		
399 > 99	45	2.844	2.846		46666	23	>100:1	2.93 (1.52-4.56)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.864	0/0	767104	19	>100:1	Target = 3.02		942.00	782.91		
377 > 85	45	2.863	2.864		276182	18	>100:1	2.77 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.212	3.213	0/0	138316	21	>100:1	Target = 3.10		952.00	897.95		
449 > 99	45	3.212	3.213		42205	23	>100:1	3.27 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.185	3.187	0	71868	21	>100:1			5000.00	4582.61	87.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.185	3.187	0/0	39173	21	>100:1	Target = 1.81		948.00	966.28		
427 > 81	64	3.185	3.187		19248	20	>100:1	2.03 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.213	0	505594	21	>100:1			1000.00	1021.89	107.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.207	0/0	420104	21	>100:1	Target = 2.85		1000.00	875.16		
413 > 169	53	3.205	3.207		154323	22	>100:1	2.72 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.584	0	154974	18	>100:1			1000.00	1112.72	106.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.584	0/0	142178	36	>100:1	Target = 3.31	0.28	928.00	821.20		
499 > 99	54	3.582	3.584		46810	35	>100:1	3.03 (1.65-4.96)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.796	0/0	487418	19	>100:1			932.00	872.21		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.925	3.935	0/0	111163	18	>100:1	Target = 2.73		960.00	900.45		
549 > 99	54	3.925	3.935		42404	23		2.62 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.231	4.235	0/0	113405	15		Target = 2.65		964.00	955.88		
599 > 99	54	4.231	4.235		44253	13	>100:1	2.56 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.394	4.396	0/0	429623	17	>100:1			942.00	861.40		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.739	4.747	0/0	113519	18	>100:1	Target = 3.07		968.00	874.45		
699 > 99	54	4.739	4.747		35000	18		3.24 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.590	3.592	0	627173	18	>100:1			1000.00	1029.52	106.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.590	3.592	0/0	641629	20	>100:1	Target = 6.36		1000.00	971.06		
463 > 169	56	3.590	3.592		96531	20	>100:1	6.64 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.876	3.885	0	289452	17	>100:1			1000.00	1084.17	94	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.876	3.885	0/0	295887	19	>100:1	Target = 37.21		1000.00	956.88		
498>478	55	3.876	3.885		11119	16		26.61 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.925	3.935	0	81466	16	>100:1			5000.00	4813.04	88.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.934	3.935	0/0	32487	19	>100:1	Target = 1.87		958.00	867.81		
527 > 81	65	3.934	3.935		20308	22	>100:1	1.59 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.540	4.542	0/0	42501	17		Target = 3.27		964.00	629.84		
627 > 80	65	4.540	4.542		12578	20	>100:1	3.37 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.943	0	622283	18	>100:1			1000.00	1054.97	101.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.942	3.943	0/0	613784	17	>100:1	Target = 13.00		1000.00	925.43		
513 > 169	51	3.934	3.943		45106	22	>100:1	13.60 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.105	0	700845	16	>100:1			5000.00	5250.39	102.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.102	4.114	0/0	107971	29	>100:1	Target = 1.39		1000.00	985.82		M
570 > 483	58	4.093	4.114		84622	30	>100:1	1.27 (0.69-2.09)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.252	4.255	0	675454	15	>100:1			1000.00	1028.28	109.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.252	4.255	0/0	555781	15	>100:1	Target = 13.51		1000.00	930.24		
563 > 169	52	4.252	4.255		35970	14	>100:1	15.45 (6.75-20.27)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.252	4.255	0	639445	16	>100:1			5000.00	5563.77	100	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.262	4.265	0/0	116488	30	>100:1	Target = 1.80	0.10	1000.00	918.02		M
584 > 526	60	4.262	4.265		75140	32	>100:1	1.55 (0.90-2.70)	0.11				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.302	4.306	0	89728	16	>100:1			1000.00	1194.50	109.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.312	4.326	0/0	98729	14	>100:1			1000.00	962.59		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.322	4.336	0	54203	13	>100:1			1000.00	1101.74	110.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.333	4.336	0/0	58545	14	>100:1	Target = 1.02		1000.00	1097.59		
512 > 219	57	4.333	4.336		53322	17	>100:1	1.09 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.468	4.479	0	93460	15	>100:1			1000.00	1193.93	102.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.486	4.488	0/0	112209	14	>100:1			1000.00	1007.66		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.495	4.497	0	47531	22	>100:1			1000.00	1144.05	103.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.495	4.506	0/0	53204	15	>100:1	Target = 0.97		1000.00	1052.33		
526 > 219	59	4.495	4.506		46158	19	>100:1	1.15 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.522	4.533	0	661644	15	>100:1			1000.00	891.19	104.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.522	4.533	0/0	653200	17	>100:1	Target = 11.10		1000.00	974.64		
613 > 169	38	4.522	4.533		59096	16	>100:1	11.05 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.766	4.774	0/0	567477	18	>100:1	Target = 7.97		1000.00	1067.84		
663 > 169	38	4.766	4.774		67608	17	>100:1	8.39 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.984	4.991	0	870328	20	>100:1			1000.00	994.63	109.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.984	4.991	0/0	626245	19	86:1	Target = 11.40		1000.00	893.23		
713 > 169	42	4.984	4.991		54063	21	>100:1	11.58 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.377	5.387	0	902003	17	>100:1			1000.00	1077.56	95.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.377	5.387	0/0	561503	18	81:1	Target = 10.50		1000.00	1041.78		
813 > 269	40	5.377	5.387		54432	18	>100:1	10.31 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.758	5.766	0/0	824047	24	67:1	Target = 13.22		1000.00	1002.51		
913 > 319	40	5.751	5.766		62890	24	>100:1	13.10 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.934	3.943	0	629399	16	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.451	0	574601	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.212	3.213	0	496997	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.710	1.712	0	472281	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.584	0	144106	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821062.d		
Injection Date:	28-Jul-2021 22:45:16	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	55
Sample Info:	ID CCV 1000C_SVLC-1573	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	543942			99.5	50 - 150
8 PFBA			1000.00	902.59	90.3	70 - 130
D 50 13C5_PFPeA	503885	518555			102.9	50 - 150
21 PFPeA			1000.00	866.21	86.6	70 - 130
7 PFBS			884.00	844.32	95.5	70 - 130
D 44 13C3_PFBS	179569	173490			96.6	50 - 150
D 63 13C2_4:2 FTS_2	94243	92455			98.1	50 - 150
1 4:2 FTS			934.00	952.24	102	70 - 130
D 49 13C5_PFHxA	629624	618670			98.3	50 - 150
15 PFHxA			1000.00	851.39	85.1	70 - 130
22 PFPeS			938.00	897.51	95.7	70 - 130
28 GenX			2000.00	1948.62	97.4	70 - 130
D 66 13C3_GenX	1187852	1042803			87.8	50 - 150
D 47 13C4_PFHpA	481492	493490			102.5	50 - 150
13 PFHpA			1000.00	870.35	87	70 - 130
D 45 13C3_PFHxS	146388	161824			110.5	50 - 150
14 PFHxS			910.00	748.96	82.3	70 - 130
29 ADONA			942.00	783.10	83.1	70 - 130
D 64 13C2_6:2 FTS_2	82438	80542			97.7	50 - 150
2 6:2 FTS			948.00	830.99	87.7	70 - 130
20 PFOA			1000.00	943.18	94.3	70 - 130
D 53 13C8_PFOA	470743	459144			97.5	50 - 150
12 PFHpS			952.00	807.90	84.9	70 - 130
18 PFOS			928.00	905.06	97.5	70 - 130
D 54 13C8_PFOS	144963	144716			99.8	50 - 150
17 PFNA			1000.00	909.61	91	70 - 130
D 56 13C9_PFNA	590148	603015			102.2	50 - 150
30 9Cl-PF3ONS			932.00	872.21	93.6	70 - 130
D 55 13C8_PFOSA	308005	279587			90.8	50 - 150
19 PFOSA			1000.00	1002.94	100.3	70 - 130
16 PFNS			960.00	898.92	93.6	70 - 130
D 65 13C2_8:2 FTS_2	92140	75672			82.1	50 - 150
10 PFDA			1000.00	893.01	89.3	70 - 130
3 8:2 FTS			958.00	947.80	98.9	70 - 130
D 51 13C6_PFDA	611283	587385			96.1	50 - 150
D 58 d3-MeFOSAA	685228	665738			97.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1123.60	112.4	70 - 130
9 PFDS			964.00	934.72	97	70 - 130
D 52 13C7_PFUdA	617181	567049			91.9	50 - 150
25 PFUdA			1000.00	1006.90	100.7	70 - 130
D 60 d5-EtFOSAA	639425	617124			96.5	50 - 150
5 N-EtFOSAA			1000.00	995.86	99.6	70 - 130
D 61 d7-MeFOSE	82233	77994			94.8	50 - 150
32 MeFOSE			1000.00	952.91	95.3	70 - 130
D 57 d3-MeFOSA	48879	47325			96.8	50 - 150
26 MeFOSA			1000.00	1390.30	139	70 - 130
31 11Cl-PF3OUDS			942.00	875.46	92.9	70 - 130
D 62 d9-EtFOSE	91569	89965			98.2	50 - 150
33 EtFOSE			1000.00	978.42	97.8	70 - 130
D 59 d5-EtFOSA	46046	46741			101.5	50 - 150
27 EtFOSA			1000.00	877.73	87.8	70 - 130
11 PFDoA			1000.00	843.61	84.4	70 - 130
D 38 13C2_PFDoA	634813	650327			102.4	50 - 150
4 10:2 FTS			964.00	655.75	68	70 - 130
34 PFDOS			968.00	949.33	98.1	70 - 130
24 PFTrDA			1000.00	978.87	97.9	70 - 130
23 PFTeDA			1000.00	907.70	90.8	70 - 130
D 42 13C2_PFTeDA	795642	809882			101.8	50 - 150
D 40 13C2_PFHxDA	940962	844877			89.8	50 - 150
35 PFHxDA			1000.00	1081.04	108.1	70 - 130
36 PFODA			1000.00	1032.52	103.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821062.d
Injection Date: 28-Jul-2021 22:45:16 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 55
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.712	0	543942	20	>100:1			1000.00	986.48	99.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.712	1/1	473419	20	>100:1			1000.00	902.59		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	0	518555	14	>100:1			1000.00	1004.29	102.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	0/0	476701	16	>100:1			1000.00	866.21		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.141	1	173490	14	>100:1			1000.00	999.56	96.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.141	1/0	189391	15	>100:1	Target = 3.42		884.00	844.32		
298.9 > 99	44	2.151	2.141		57216	16	>100:1	3.31 (1.71-5.14)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.487	2.487	0/-1	145537	17	>100:1	Target = 2.97		938.00	897.51		
349 > 99	44	2.487	2.487		51479	17	>100:1	2.82 (1.48-4.46)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.416	0	92455	15	>100:1			5000.00	4637.62	98.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.416	0/0	35571	15		Target = 1.63		934.00	952.24		
327 > 81	63	2.416	2.416		20280	18	>100:1	1.75 (0.81-2.44)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.451	1	618670	17	>100:1			1000.00	1025.87	98.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.451	1/0	538433	18	>100:1	Target = 18.20		1000.00	851.39		
313 > 119	49	2.451	2.451		29160	15	>100:1	18.46 (9.10-27.30)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.567	1	1042803	19	>100:1			5000.00	4896.46	87.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	0/-1	279837	18	>100:1	Target = 0.78		2000.00	1948.62		
285 > 185	66	2.575	2.575		376513	17	>100:1	0.74 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.827	1	493490	18				1000.00	1017.54	102.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.827	2.827	0/-1	481663	18	>100:1	Target = 3.72		1000.00	870.35		
363 > 169	47	2.836	2.827		129046	17	>100:1	3.73 (1.86-5.59)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.846	0	161824	18	>100:1			1000.00	1165.19	110.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.846	0/0	129787	24	>100:1	Target = 3.04	0.15	910.00	748.96		
399 > 99	45	2.845	2.846		47697	22	>100:1	2.72 (1.52-4.56)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.864	1/1	790592	17	>100:1	Target = 3.02		942.00	783.10		
377 > 85	45	2.873	2.864		268871	17	>100:1	2.94 (1.51-4.53)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.221	3.213	1/1	128226	19	>100:1	Target = 3.10		952.00	807.90		
449 > 99	45	3.221	3.213		42263	20	>100:1	3.03 (1.55-4.65)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.194	3.187	1	80542	21	>100:1			5000.00	5135.70	97.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.194	3.187	1/0	37754	21		Target = 1.81		948.00	830.99		
427 > 81	64	3.194	3.187		19630	19	>100:1	1.92 (0.90-2.72)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.214	3.213	1	459144	22	>100:1			1000.00	928.01	97.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.214	3.207	1/0	411162	21	>100:1	Target = 2.85		1000.00	943.18		
413 > 169	53	3.214	3.207		162098	21	>100:1	2.53 (1.42-4.28)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.593	3.584	1	144716	17	>100:1			1000.00	1039.06	99.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.593	3.584	1/0	146041	35	>100:1	Target = 3.31	0.28	928.00	905.06		
499 > 99	54	3.593	3.584		38841	33	>100:1	3.75 (1.65-4.96)	0.12				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.798	3.796	1/0	455153	19	>100:1			932.00	872.21		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.937	3.935	1/0	103629	17	>100:1	Target = 2.73		960.00	898.92		
549 > 99	54	3.937	3.935		38472	16	>100:1	2.69 (1.36-4.10)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.235	1/0	103572	14	>100:1	Target = 2.65		964.00	934.72		
599 > 99	54	4.247	4.235		42163	15		2.45 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.405	4.396	1/0	407732	17	>100:1			942.00	875.46		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.755	4.747	1/0	115082	20	>100:1	Target = 3.07		968.00	949.33		
699 > 99	54	4.748	4.747		37562	18		3.06 (1.53-4.61)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.601	3.592	1	603015	19	>100:1			1000.00	989.86	102.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.601	3.592	1/0	577876	19	>100:1	Target = 6.36		1000.00	909.61		
463 > 169	56	3.601	3.592		91531	18	>100:1	6.31 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.887	3.885	1	279587	17	>100:1			1000.00	1047.22	90.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.896	3.885	1/0	299560	17	>100:1	Target = 37.21		1000.00	1002.94		
498>478	55	3.896	3.885		8223	15	56:1	36.42 (18.60-55.82)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.935	1	75672	17				5000.00	4470.73	82.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.945	3.935	1/0	32958	15	>100:1	Target = 1.87		958.00	947.80		
527 > 81	65	3.945	3.935		19100	20	99:1	1.72 (0.93-2.81)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.552	4.542	1/0	41102	22		Target = 3.27		964.00	655.75		
627 > 80	65	4.544	4.542		12785	14	>100:1	3.21 (1.63-4.91)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.945	3.943	1	587385	16	>100:1			1000.00	995.81	96.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.954	3.943	1/0	559065	16	>100:1	Target = 13.00		1000.00	893.01		
513 > 169	51	3.954	3.943		42909	15		13.02 (6.50-19.50)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.105	1	665738	17	>100:1			5000.00	4987.38	97.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.116	4.114	1/0	116897	32	>100:1	Target = 1.39	0.09	1000.00	1123.60		M
570 > 483	58	4.107	4.114		77135	30	>100:1	1.51 (0.69-2.09)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.255	1	567049	16	>100:1			1000.00	863.25	91.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.267	4.255	1/0	505035	15	>100:1	Target = 13.51		1000.00	1006.90		
563 > 169	52	4.257	4.255		36338	12	>100:1	13.89 (6.75-20.27)					M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.267	4.255	1	617124	15	>100:1			5000.00	5369.55	96.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.265	1/0	121954	33	>100:1	Target = 1.80		1000.00	995.86		M
584 > 526	60	4.267	4.265		72539	31	>100:1	1.68 (0.90-2.70)	0.26				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.306	1	77994	14	>100:1			1000.00	1038.29	94.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.326	1/0	84955	15	>100:1			1000.00	952.91		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.336	1	47325	20	>100:1			1000.00	961.94	96.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.338	4.336	1/0	64748	15	>100:1	Target = 1.02		1000.00	1390.30		
512 > 219	57	4.338	4.336		51211	15	>100:1	1.26 (0.51-1.54)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.479	1	89965	17	>100:1			1000.00	1149.29	98.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.490	4.488	1/0	104879	15	>100:1			1000.00	978.42		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.499	4.497	1	46741	13	>100:1			1000.00	1125.04	101.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.508	4.506	1/0	43813	17	>100:1	Target = 0.97		1000.00	877.73		
526 > 219	59	4.517	4.506		54564	12	>100:1	0.80 (0.48-1.46)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.544	4.533	1	650327	15	>100:1			1000.00	875.95	102.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.544	4.533	1/0	555713	17	>100:1	Target = 11.10		1000.00	843.61		
613 > 169	38	4.535	4.533		48497	15	>100:1	11.45 (5.55-16.65)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.782	4.774	1/0	511301	19	>100:1	Target = 7.97		1000.00	978.87		
663 > 169	38	4.782	4.774		64188	19	>100:1	7.96 (3.98-11.95)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.991	1	809882	20	>100:1			1000.00	925.55	101.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.991	1/0	592193	20	91:1	Target = 11.40		1000.00	907.70		
713 > 169	42	4.998	4.991		51466	20	>100:1	11.50 (5.70-17.11)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.387	1	844877	18	>100:1			1000.00	1009.31	89.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.390	5.387	1/0	545759	19	83:1	Target = 10.50		1000.00	1081.04		
813 > 269	40	5.390	5.387		52976	18	>100:1	10.30 (5.25-15.76)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.775	5.766	1/0	794963	23	66:1	Target = 13.22		1000.00	1032.52		
913 > 319	40	5.768	5.766		62970	23	>100:1	12.62 (6.61-19.83)					
*** 37 13C2_PFDA**													
515 > 470		3.945	3.943	1	595692	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.451	1	544853	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.213	1	492451	20	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.712	0	462041	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.593	3.584	1	141554	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072521-DOD.b\072521007.d		
Injection Date:	25-Jul-2021 12:44:01	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.721	1.721	0	866805	19	>100:1			1001.00	934.23	96.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.727		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.089	2.099	0	914465	16	>100:1			1001.00	947.45	99.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.099		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.151	0	269161	15	>100:1			1001.00	946.34	94.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.151		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.511		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.424	2.433	0	175270	17	>100:1			5005.00	3817.63	98.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.441		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.467	2.476	0	751311	18	>100:1			1001.00	887.63	95.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.476		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.586	2.594	0	842854	18	>100:1			5005.00	5934.00	93.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.594		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.853	2.862	0	772610	18	>100:1			1001.00	870.24	90.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.862		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.871	2.880	0	244137	18	>100:1			1001.00	971.77	97.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.880		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.898		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.259		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.220	3.227	0	159700	23	>100:1			5005.00	4306.43	91.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.220		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.246	3.252	0	811578	21	>100:1			1001.00	950.22	102.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.259		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.620	3.628	0	208780	25	>100:1			1001.00	978.24	96.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.628		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.836		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.975		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.265		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.423		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.763		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.628	3.635	0	829225	20	>100:1			1001.00	936.89	97.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.635		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.896	3.904	0	432309	17	>100:1			1001.00	1078.27	97.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.904		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.967	3.975	0	150620	18	>100:1			5005.00	5274.57	88.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.967		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.555		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.967	3.975	0	722132	19	>100:1			1001.00	1004.66	96.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.975		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.120	4.136	0	968450	17	>100:1			5005.00	5409.23	97.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.136		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.274	4.284	0	715518	16	>100:1			1001.00	1063.95	96.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.284		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.284	4.284	0	936399	15	>100:1			5005.00	5782.26	103	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.293		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.311	4.302	1	181482	14	>100:1			1001.00	1209.33	102.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.312		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.330	4.321	1	57741	15	>100:1			1001.00	970.79	84.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.330		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.547	4.555	0	688965	18	>100:1			1001.00	950.17	91.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.555		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.791		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.465	4.465	0	175371	16	>100:1			1001.00	1223.28	98	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.473		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.490	4.490	0	58076	18	>100:1			1001.00	1011.01	96.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.498		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.001	5.014	0	853944	19	>100:1			1001.00	1079.82	93.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		5.014		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.398	5.416	-1	577341	18	>100:1			1001.00	1417.65	100.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.398	5.416	-1/0	9424	18	42:1	Target = 13.88		10.163	10.163		
813 > 269	40	5.398	5.416		729	21	35:1	12.92 (6.94-20.83)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.816		ND								
*** 37 13C2_PFDA**													
515 > 470		3.975	3.985	0	822707	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.467	2.476	0	870289	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.246	3.259	0	972534	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.721	1.727	0	1000602	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.620	3.628	0	256151	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072621-DOD.b\072621007.d		
Injection Date:	26-Jul-2021 12:15:44	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Reagent:	Istds	Conc. Level: Smp	Vol. Added: 0.0100 ml
Reagent:	Surrogates	Conc. Level: Smp	Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.719	1.719	0	965910	20	>100:1			1001.00	1041.04	98.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.719		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.087	2.088	0	959526	17	>100:1			1001.00	994.14	94.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.140	0	297682	15	>100:1			1001.00	1046.61	102.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.140		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.493		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.423	2.415	1	210458	18	>100:1			5005.00	4584.08	87.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.415		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.458	2.459	0	880964	17	>100:1			1001.00	1040.81	101.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.459		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.579	2.579	0	748837	18	>100:1			5005.00	5272.08	102.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.579	2.579	0/0	1132	11	3.8:1	Target = 0.79		9.4523	9.4523		
285 > 185	66	2.586	2.579		1922	19	5.4:1	0.58 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.845	2.847	0	929361	17	>100:1			1001.00	1046.79	98.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.847		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.863	2.864	0	260762	18	>100:1			1001.00	1037.94	95.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.864		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.882		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.243		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.204	3.205	0	207033	29	>100:1			5005.00	5582.79	94.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.211		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.229	3.230	0	900586	22	>100:1			1001.00	1054.44	101.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.237		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.604	3.598	1	207160	20	>100:1			1001.00	970.65	90	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.598		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.810		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.938		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.233		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.390		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.731		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.604	3.606	0	922911	20	>100:1			1001.00	1042.74	101	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.613		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.888	3.884	1	456715	19	>100:1			1001.00	1139.14	102	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.884		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.942	3.946	0	184725	19	>100:1			5005.00	6468.90	101.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.954		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.529		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.950	3.946	1	751249	18	>100:1			1001.00	1045.17	91.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.946		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.095	4.100	0	997643	17	>100:1			5005.00	5572.28	96.1	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.108		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.256	4.252	1	733407	15	>100:1			1001.00	1090.55	94.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.252		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.256	4.252	1	883090	16	>100:1			5005.00	5453.08	94.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.262		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.302	4.290	1	165246	15	>100:1			1001.00	1101.14	123.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.308		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.321	4.318	1	65249	14	>100:1			1001.00	1097.02	94.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.327		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.515	4.521	0	778542	17	>100:1			1001.00	1073.71	98.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.521		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.762		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.457	4.455	1	154345	18	>100:1			1001.00	1076.62	100.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.472		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.482	4.472	1	58636	18	>100:1			1001.00	1020.76	78.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.480		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.974	4.980	0	735864	17	>100:1			1001.00	930.51	91.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.980		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.360	5.365	0	483096	18	>100:1			1001.00	1186.23	95.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.360	5.373	0/0	8586	14	26:1	Target = 13.88		11.065	11.065		
813 > 269	40	5.360	5.373		681	15	31:1	12.60 (6.94-20.83)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.744		ND								
*** 37 13C2_PFDA**													
515 > 470		3.950	3.946	1	757074	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.458	2.467	0	773226	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.229	3.237	0	855933	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.719	1.719	0	911522	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.597	3.606	0	234768	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072721-DOD.b\072721007.d		
Injection Date:	27-Jul-2021 14:52:08	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.717	1.717	0	535743	21	>100:1			1001.00	971.61	96.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.723	1.717	1/1	3294	13	2.1:1			6.3826	6.3826		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.098	2.087	1	535183	16	>100:1			1001.00	1036.50	101.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.087		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.150	2.150	0	173170	15	>100:1			1001.00	997.72	94.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.140		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.486		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.406	1	97819	18	>100:1			5005.00	4906.69	102.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.406		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.450	0	591509	17	>100:1			1001.00	980.83	95.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.450		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.566	2.566	0	1182540	18	>100:1			5005.00	5552.59	98.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.566		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.826	0	484711	18	>100:1			1001.00	999.43	100.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.826		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.844	2.835	1	139805	17	>100:1			1001.00	1006.65	97.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.835		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.863		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.205		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.178	0	90497	22	>100:1			5005.00	5770.48	113.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.178		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.198	1	498795	21	>100:1			1001.00	1008.15	97.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.205		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.574	3.574	0	143701	19	>100:1			1001.00	1031.78	95.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.582		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.780		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.917		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.221		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.378		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.718		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.574	1	628765	20	>100:1			1001.00	1032.13	100.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.582		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.884	3.884	0	307010	17	>100:1			1001.00	1149.94	106.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.876		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.925	3.917	1	94395	17				5005.00	5576.89	107.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.917		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.513		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.925	3.925	0	585985	18	>100:1			1001.00	993.44	99.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.925		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.084	4.084	0	712797	17	>100:1			5005.00	5339.92	112.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.084		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.242	4.231	1	675900	15	>100:1			1001.00	1028.96	110.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.242		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.242	4.242	0	693243	16	>100:1			5005.00	6031.86	114.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.242		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.312	4.302	1	87200	14	>100:1			1001.00	1160.84	99.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.312		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.333	4.323	1	51642	14	>100:1			1001.00	1049.68	109.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.333		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.477	4.468	1	103493	15	>100:1			1001.00	1322.10	107.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.486		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.495	4.495	1	45545	13	>100:1			1001.00	1096.25	94.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.504		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.513	4.513	1	617043	16	>100:1			1001.00	831.12	95.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.513	1/0	2233	18	1.5:1	Target = 10.01		3.5763	3.5763		
613 > 169	38	4.513	4.513		112	13		19.93 (5.00-15.02)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.752		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	4.964	0	777993	19	>100:1			1001.00	889.11	97.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.964		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.351	5.343	1	882377	17	>100:1			1001.00	1054.11	100.6	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.351	5.351	0/-1	5598	20	34:1	Target = 10.45		10.628	10.628		
813 > 269	40	5.351	5.351		496	14	37:1	11.28 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.716		ND								
*** 37 13C2_PFDA**													
515 > 470		3.934	3.925	1	633950	19							
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.450	1	534268	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.198	1	485969	20	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.717	1.717	0	482762	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.574	3.574	0	134933	19							

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821007.d		
Injection Date:	28-Jul-2021 12:58:02	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.712	1	514911	20	>100:1			1001.00	933.83	94.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.712		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.094	2.088	1	486224	16	>100:1			1001.00	941.68	96.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.146	2.141	1	169243	15	>100:1			1001.00	975.09	94.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.141		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.487		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.416	0	94842	17	>100:1			5005.00	4757.36	100.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.459	2.451	1	558806	17	>100:1			1001.00	926.60	88.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.451		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.574	2.567	1	1168151	18	>100:1			5005.00	5485.03	98.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.575		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.827	0	483025	17	>100:1			1001.00	995.96	100.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.827		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.844	2.846	0	145808	24				1001.00	1049.87	99.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.846		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.864		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.213		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.185	3.187	0	85628	21	>100:1			5005.00	5460.01	103.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.187		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.211	3.213	0	468013	21	>100:1			1001.00	945.93	99.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.207		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.584	0	139485	18	>100:1			1001.00	1001.51	96.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.584		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.796		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.935		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.235		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.396		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.747		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.590	3.592	0	593988	18	>100:1			1001.00	975.04	100.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.592		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.884	3.885	0	303074	17	>100:1			1001.00	1135.20	98.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.885		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.942	3.935	1	81236	19				5005.00	4799.45	88.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.935		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.542		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.942	3.943	0	514081	17	>100:1			1001.00	871.54	84.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.943		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.102	4.105	0	708877	17	>100:1			5005.00	5310.56	103.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.114		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.252	4.255	0	566843	16				1001.00	862.94	91.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.255		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.262	4.255	1	617640	15	>100:1			5005.00	5374.04	96.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.265		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.312	4.306	1	91688	14	>100:1			1001.00	1220.59	111.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.326		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.333	4.336	0	53403	16	>100:1			1001.00	1085.48	109.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.336		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.477	4.479	0	100333	14	>100:1			1001.00	1281.73	109.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.488		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.495	4.497	0	51189	15	>100:1			1001.00	1232.10	111.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.506		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.531	4.533	0	572892	16	>100:1			1001.00	771.65	90.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.533		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.774		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.995	4.991	1	761042	19	>100:1			1001.00	869.74	95.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.991		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.385	5.387	0	912191	17	>100:1			1001.00	1089.73	96.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.385	5.387	0/0	5682	23	26:1	Target = 10.45		10.435	10.435		
813 > 269	40	5.376	5.387		388	19	20:1	14.64 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.766		ND								
*** 37 13C2_PFDA**													
515 > 470		3.942	3.943	0	622792	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.451	1	541240	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.211	3.213	0	488278	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.715	1.712	1	454334	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.584	0	140885	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47	072221B017.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24	072221B018.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59	072221B019.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35	072221B020.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15	072221B021.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49	072221B022.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27	072221B023.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08	072221B024.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44	072221B025.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22	072221B026.d	ICal					Analytes	L-10	1.00		
11	ID IBLK A	23-Jul-2021 01:04:03	072221B027.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1577	23-Jul-2021 01:14:35	072221B028.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK STD_SVLC-1562	23-Jul-2021 01:25:08	072221B029.d	CheckStd					IsomerCheck	Smp	1.00		

Report Date: 25-Jul-2021 09:48:01 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35	072221016.d	ICal					Analytes	L-1	1.00		
2	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06	072221017.d	ICal					Analytes	L-2	1.00		
3	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38	072221018.d	ICal					Analytes	L-3	1.00		
4	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12	072221019.d	ICal					Analytes	L-4	1.00		
5	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44	072221020.d	ICal					Analytes	L-5	1.00		
6	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19	072221021.d	ICal					Analytes	L-6	1.00		
7	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51	072221022.d	ICal					Analytes	L-7	1.00		
8	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28	072221023.d	ICal					Analytes	L-8	1.00		
9	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04	072221024.d	ICal					Analytes	L-9	1.00		
10	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42	072221025.d	ICal					Analytes	L-10	1.00		
100	ID BLK C1	22-Jul-2021 18:14:21	072221026.d	InstBlk					Surrogates	Smp	0.1100		
11	ICV 500_SVLC-1577	22-Jul-2021 18:25:03	072221027.d	ICV					Analytes	ICV	1.00		
12	ISOMERS_SVLC-1562	22-Jul-2021 18:35:36	072221028.d	CheckStd					IsomerCheck	Smp	1.00		
13	ID IBLK A	22-Jul-2021 18:46:09	072221029.d	InstBlk					Surrogates	Smp	0.1100		
14	WG10017-020	22-Jul-2021 18:56:42	072221030.d	Client	AOPC26-W5-3-070821	Aqueous	10	99310	Surrogates	Smp	0.1100		
15	WG16047-007	22-Jul-2021 19:07:15	072221031.d	Client	OU2-RCVTW-071621	Aqueous	5	99449	Surrogates	Smp	0.1100		
16	WQ99569-001	22-Jul-2021 19:17:50	072221032.d	MBlk		Aqueous	1	99569	Surrogates	Smp	0.1100		
17	WQ99569-101	22-Jul-2021 19:28:26	072221033.d	MBlk		Aqueous	1	99569	Surrogates	Smp	0.1100		
18	WQ99569-201	22-Jul-2021 19:39:00	072221034.d	MBlk		Aqueous	1	99569	Surrogates	Smp	0.1100		
19	WQ99569-002	22-Jul-2021 19:49:35	072221035.d	LCS		Aqueous	1	99569	Analytes	100x PDS	0.2000		
20	WQ99569-102	22-Jul-2021 20:00:13	072221036.d	LCS		Aqueous	1	99569	Analytes	100x PDS	0.2000		
21	WQ99569-202	22-Jul-2021 20:10:53	072221037.d	LCS		Aqueous	1	99569	Analytes	100x PDS	0.2000		
22	Stacked LCS_21-1520	22-Jul-2021 20:21:24	072221038.d	LCS		Aqueous	1		Analytes	100x PDS	0.2000		TeDA EIS @ 77.3%; clear for use
23	CCV 1000_SVLC-1573	22-Jul-2021 20:31:57	072221039.d	CCV					Analytes	L-5	1.00		
100	CCB C1	22-Jul-2021 20:42:32	072221040.d	InstBlk					Surrogates	Smp	0.1100		

Report Date: 28-Jul-2021 06:40:34 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\072521-DOD.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	CCV 100_SVLC-1546	25-Jul-2021 12:22:57	072521005.d	CCV					Analytes	L-2	1.00		
96	CCV 200_SVLC-1547	25-Jul-2021 12:33:30	072521006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	25-Jul-2021 12:44:01	072521007.d	InstBlk					Surrogates	Smp	0.1100		
51	ID CCV 1000C_SVLC-1573	25-Jul-2021 22:25:58	072521062.d	CCV					Analytes	L-5	1.00		
100	CCB C4	25-Jul-2021 22:36:32	072521063.d	InstBlk					Surrogates	Smp	0.1100		
52	WG12034-001	25-Jul-2021 22:47:14	072521064.d	Client	GMW-01	Aqueous	100	99698	Surrogates	Smp	0.1100		RR-200X
53	WG12034-002	25-Jul-2021 22:57:48	072521065.d	Client	GMW-02	Aqueous	1	99698	Surrogates	Smp	0.1100		RR-1X-C/O
54	WQ99902-001	25-Jul-2021 23:08:22	072521066.d	MBlk		Aqueous	1	99902	Surrogates	Smp	0.1100		
55	WQ99902-002	25-Jul-2021 23:18:56	072521067.d	LCS		Aqueous	1	99902	Analytes	100x PDS	0.2000		
56	WG16047-007	25-Jul-2021 23:29:32	072521068.d	Client	OU2-RCVTW-071621	Aqueous	1	99902	Surrogates	Smp	0.1100		OK @1X, RX FOR TeDA/LCS ONLY
94	ID BLK B3	25-Jul-2021 23:40:10	072521069.d	InstBlk					Surrogates	Smp	0.1100		
57	CCV 1000D_SVLC-1573	25-Jul-2021 23:50:40	072521070.d	CCV					Analytes	L-5	1.00		
100	CCB C5	26-Jul-2021 00:01:18	072521071.d	InstBlk					Surrogates	Smp	0.1100		

Report Date: 27-Jul-2021 15:29:30 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\072621-DOD.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	CCV 100_SVLC-1546	26-Jul-2021 11:54:38	072621005.d	CCV					Analytes	L-2	1.00		
96	CCV 200_SVLC-1547	26-Jul-2021 12:05:12	072621006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	26-Jul-2021 12:15:44	072621007.d	InstBlk					Surrogates	Smp	0.1100		
11	CCV 1000_SVLC-1573	26-Jul-2021 14:22:47	072621019.d	CCV					Analytes	L-5	1.00		
15	WG12034-001	26-Jul-2021 15:04:59	072621023.d	Client	GMW-01	Aqueous	200	99698	Surrogates	Smp	0.1100		RR-200X, 8:2 CCV
16	WG12034-002	26-Jul-2021 15:15:33	072621024.d	Client	GMW-02	Aqueous	1	99698	Surrogates	Smp	0.1100		
17	WG20002-029	26-Jul-2021 15:26:08	072621025.d	Client	ERB-071321-S	Aqueous	1	99902	Surrogates	Smp	0.1100		
18	WG20004-001	26-Jul-2021 15:36:42	072621026.d	Client	AOPC18-11E02A-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		
19	WG20004-001MS	26-Jul-2021 15:47:17	072621027.d	MS		Aqueous	1	99902	Analytes	100x PDS	0.2000		
20	WG20004-002	26-Jul-2021 15:57:54	072621028.d	Client	AOPC18-WNB-7-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		
21	WG20004-002DU	26-Jul-2021 16:08:33	072621029.d	Client		Aqueous	1	99902	Surrogates	Smp	0.1100		
22	WG20004-003	26-Jul-2021 16:19:05	072621030.d	Client	AOPC1-11N21A1-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		RR-50X, DNR-8:2 CCV
23	WG20004-004	26-Jul-2021 16:29:38	072621031.d	Client	AOPC8-W11-2-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		RR-1X-C/O
24	CCV 1000A_SVLC-1573	26-Jul-2021 16:40:13	072621032.d	CCV					Analytes	L-5	1.00		8:2 FTS HIGH-NCM/ND#
100	CCB C1	26-Jul-2021 16:50:54	072621033.d	InstBlk					Surrogates	Smp	0.1100		
25	WG20004-005	26-Jul-2021 17:01:36	072621034.d	Client	AOPC6-WV4-18-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		RR-10X, DNR-8:2 CCV
26	WG20004-006	26-Jul-2021 17:12:12	072621035.d	Client	FB04-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		
27	WG20004-007	26-Jul-2021 17:22:47	072621036.d	Client	AOPC25-15H12A-071321	Aqueous	1	99902	Surrogates	Smp	0.1100		
28	WG20004-008	26-Jul-2021 17:33:23	072621037.d	Client	AOPC25-15B10A-071321	Aqueous	1	99902	Surrogates	Smp	0.1100		
29	WG20004-009	26-Jul-2021 17:44:00	072621038.d	Client	AOPC24-64A-071321	Aqueous	1	99902	Surrogates	Smp	0.1100		
30	WG20004-010	26-Jul-2021 17:54:35	072621039.d	Client	AOPC24-WU4-1-071321	Aqueous	1	99902	Surrogates	Smp	0.1100		
31	WG20004-011	26-Jul-2021 18:05:13	072621040.d	Client	FB-05-071321	Aqueous	1	99902	Surrogates	Smp	0.1100		6:2 SUR HIGH-NCM/ND#
32	WG20004-012	26-Jul-2021 18:15:47	072621041.d	Client	AOPC5-WU4-19-071421	Aqueous	1	99902	Surrogates	Smp	0.1100		RR-10X
33	CCV 1000B_SVLC-1573	26-Jul-2021 18:26:20	072621042.d	CCV					Analytes	L-5	1.00		
100	CCB C2	26-Jul-2021 18:36:54	072621043.d	InstBlk					Surrogates	Smp	0.1100		

Report Date: 28-Jul-2021 18:06:56 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\072721-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	27-Jul-2021 14:31:00	072721005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	27-Jul-2021 14:41:33	072721006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	27-Jul-2021 14:52:08	072721007.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ99970-001	27-Jul-2021 15:02:47	072721008.d	MBlk		Soil	1	99970	Surrogates	Smp	0.1100		
2	WQ99970-002	27-Jul-2021 15:13:25	072721009.d	LCS		Soil	1	99970	Analytes	100x PDS	0.1000		
7	ID IBLK B	27-Jul-2021 16:06:39	072721014.d	InstBlk					Surrogates	Smp	0.1100		8:2(ND),MFOSAA(ND),EFOSAA(ND)
8	WQ99971-001	27-Jul-2021 16:17:23	072721015.d	MBlk		Soil	1	99971	Surrogates	Smp	0.1100		
9	WQ99971-002	27-Jul-2021 16:28:01	072721016.d	LCS		Soil	1	99971	Analytes	100x PDS	0.1000		
10	WQ99971-003	27-Jul-2021 16:38:41	072721017.d	LCSD		Soil	1	99971	Analytes	100x PDS	0.1000		
11	WG21050-001	27-Jul-2021 16:49:22	072721018.d	Client	FP-15	Soil	1	99971	Surrogates	Smp	0.1100		
12	WG21050-002	27-Jul-2021 16:59:55	072721019.d	Client	FP-15c	Soil	1	99971	Surrogates	Smp	0.1100		
13	WG21050-003	27-Jul-2021 17:10:29	072721020.d	Client	FP-15e	Soil	1	99971	Surrogates	Smp	0.1100		RR-5X(UdA,DoA)
14	WG21051-001	27-Jul-2021 17:21:05	072721021.d	Client	FP-14/PTFE Powder	Soil	1	99971	Surrogates	Smp	0.1100		RR-100X(ALL)
15	WG21051-002	27-Jul-2021 17:31:43	072721022.d	Client	FP-14c/PTFE Powder	Soil	1	99971	Surrogates	Smp	0.1100		RR-5X(UdA,DoA)
16	WG21051-003	27-Jul-2021 17:42:26	072721023.d	Client	FP-14e/PTFE Powder	Soil	1	99971	Surrogates	Smp	0.1100		
17	WG20002-001	27-Jul-2021 17:53:06	072721024.d	Client	AOPC7-SB01-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		
18	ID CCV 1000_SVLC-1573	27-Jul-2021 18:03:42	072721025.d	CCV					Analytes	L-5	1.00		10:2 LOW, NOT REPORTED FOR SAMPLES
19	CCB 1	27-Jul-2021 18:14:20	072721026.d	InstBlk					Surrogates	Smp	0.1100		
20	WG20002-002	27-Jul-2021 18:25:01	072721027.d	Client	AOPC7-SB01-0.5-2	Soil	1	99970	Surrogates	Smp	0.1100		
21	WG20002-003	27-Jul-2021 18:35:42	072721028.d	Client	AOPC7-SB02-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		RR 5X @PFOS
22	WG20002-004	27-Jul-2021 18:46:20	072721029.d	Client	AOPC7-SB02-0.5-2	Soil	1	99970	Surrogates	Smp	0.1100		RR 20X@ PFOS
23	WG20002-005	27-Jul-2021 18:56:56	072721030.d	Client	AOPC1-SB01-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		
24	WG20002-006	27-Jul-2021 19:07:37	072721031.d	Client	AOPC1-SB01-0.5-2	Soil	1	99970	Surrogates	Smp	0.1100		
25	WG20002-007	27-Jul-2021 19:18:16	072721032.d	Client	AOPC1-SB02-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		Sur 8:2(ND),NCM
26	WG20002-008	27-Jul-2021 19:28:56	072721033.d	Client	AOPC1-SB02-0.5-2	Soil	1	99970	Surrogates	Smp	0.1100		
27	WG20002-009	27-Jul-2021 19:39:35	072721034.d	Client	AOPC1-SB03-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		RR 5X PFOS
28	WG20002-010	27-Jul-2021 19:50:18	072721035.d	Client	AOPC1-SB03-0.5-2	Soil	1	99970	Surrogates	Smp	0.1100		RR 10X @PFOS
29	WG20002-011	27-Jul-2021 20:00:55	072721036.d	Client	AOPC1-SB04-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		
30	ID CCV 1000A_SVLC-1573	27-Jul-2021 20:11:34	072721037.d	CCV					Analytes	L-5	1.00		
31	CCB 2	27-Jul-2021 20:22:15	072721038.d	InstBlk					Surrogates	Smp	0.1100		
32	id sur 100ppb_SVLC-1584	27-Jul-2021 20:32:49	072721039.d	Client		Aqueous	1		Surrogates	Smp	0.1100		CLEAN, GOOD TO USE
33	WG20002-012	27-Jul-2021 20:43:25	072721040.d	Client	AOPC1-SB04-0.5-2	Soil	1	99970	Surrogates	Smp	0.1100		
34	WG20002-013	27-Jul-2021 20:54:02	072721041.d	Client	AOPC6-SB01-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		
35	WG20002-014	27-Jul-2021 21:04:44	072721042.d	Client	AOPC6-SB01-0.5-2	Soil	1	99970	Surrogates	Smp	0.1100		RR 20X @PFOS
36	WG20002-015	27-Jul-2021 21:15:27	072721043.d	Client	AOPC2-SB01-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		
37	WG20002-016	27-Jul-2021 21:26:05	072721044.d	Client	AOPC2-SB01-0.5-2	Soil	1	99970	Surrogates	Smp	0.1100		
38	WG20002-017	27-Jul-2021 21:36:43	072721045.d	Client	AOPC2-SB02-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		
39	WG20002-018	27-Jul-2021 21:47:22	072721046.d	Client	AOPC2-SB02-0.5-2	Soil	1	99970	Surrogates	Smp	0.1100		
40	WG20002-019	27-Jul-2021 21:58:02	072721047.d	Client	AOPC2-SB03-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		
41	WG20002-019MS	27-Jul-2021 22:08:42	072721048.d	MS		Soil	1	99970	Analytes	100x PDS	0.1000		10:2 FTS recovery failed
42	WG20002-019MD	27-Jul-2021 22:19:18	072721049.d	MSD		Soil	1	99970	Analytes	100x PDS	0.1000		PFBA recovery failed @149.6%, PFHxS @140.1%,
43	WG20002-021	27-Jul-2021 22:29:56	072721050.d	Client	AOPC2-SB04-0-0.5	Soil	1	99970	Surrogates	Smp	0.1100		
44	ID CCV 1000B_SVLC-1573	27-Jul-2021 22:40:38	072721051.d	CCV					Analytes	L-5	1.00		

Report Date: 29-Jul-2021 18:55:03 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\072821-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	28-Jul-2021 12:35:26	072821005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	28-Jul-2021 12:46:55	072821006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	28-Jul-2021 12:58:02	072821007.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ10188-001	28-Jul-2021 13:10:17	072821008.d	MBlk		Aqueous	1	10188	Surrogates	Smp	0.1100		
2	WQ10188-002	28-Jul-2021 13:21:19	072821009.d	LCS		Aqueous	1	10188	Analytes	100x PDS	0.2000		PeS(133.4),MFOSA(167%), RR TO CONFIRM
3	WG27017-001	28-Jul-2021 13:32:11	072821010.d	Client	AFFF21-FRB-01-072621-00	Aqueous	1	10188	Surrogates	Smp	0.1100		
4	WG27017-002	28-Jul-2021 13:43:06	072821011.d	Client	AFFF21-ICE-01-072621-01	Aqueous	1	10188	Surrogates	Smp	0.1100		
5	WG27016-001	28-Jul-2021 13:53:42	072821012.d	Client	AFFF21-GAC-01-072621-00	Aqueous	1	10188	Surrogates	Smp	0.1100		
6	WG21050-003	28-Jul-2021 14:04:16	072821013.d	Client	FP-15e	Soil	5	99971	Surrogates	Smp	0.1100		
7	WG21051-002	28-Jul-2021 14:14:53	072821014.d	Client	FP-14c/PTFE Powder	Soil	5	99971	Surrogates	Smp	0.1100		
8	WG21051-001	28-Jul-2021 14:25:35	072821015.d	Client	FP-14/PTFE Powder	Soil	100	99971	Surrogates	Smp	0.1100		
9	WG20002-003	28-Jul-2021 14:36:13	072821016.d	Client	AOPC7-SB02-0-0.5	Soil	5	99970	Surrogates	Smp	0.1100		
10	WG20002-004	28-Jul-2021 14:46:51	072821017.d	Client	AOPC7-SB02-0.5-2	Soil	20	99970	Surrogates	Smp	0.1100		
11	WG20002-009	28-Jul-2021 14:57:32	072821018.d	Client	AOPC1-SB03-0-0.5	Soil	5	99970	Surrogates	Smp	0.1100		
12	WG20002-010	28-Jul-2021 15:08:05	072821019.d	Client	AOPC1-SB03-0.5-2	Soil	10	99970	Surrogates	Smp	0.1100		
13	ID CCV 1000_SVLC-1573	28-Jul-2021 15:18:39	072821020.d	CCV					Analytes	L-5	1.00		
14	ccb 1	28-Jul-2021 15:29:15	072821021.d	InstBlk					Surrogates	Smp	0.1100		
15	WG20002-014	28-Jul-2021 15:39:52	072821022.d	Client	AOPC6-SB01-0.5-2	Soil	20	99970	Surrogates	Smp	0.1100		
16	WG20004-019	28-Jul-2021 15:50:32	072821023.d	Client	FB-07-071521	Aqueous	1	10188	Surrogates	Smp	0.1100		
17	WG20004-020	28-Jul-2021 16:01:10	072821024.d	Client	AOPC5-14D12A-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
18	WG20004-021	28-Jul-2021 16:11:48	072821025.d	Client	AOPC5-14D12A-071621-FD	Aqueous	1	10188	Surrogates	Smp	0.1100		
19	WG20004-022	28-Jul-2021 16:22:25	072821026.d	Client	AOPC3-W19-2-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
20	WG20004-023	28-Jul-2021 16:33:05	072821027.d	Client	AOPC3-W7-10-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
21	WG20004-024	28-Jul-2021 16:43:46	072821028.d	Client	AOPC24-171A-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
22	WG20004-024MS	28-Jul-2021 16:54:22	072821029.d	MS		Aqueous	1	10188	Analytes	100x PDS	0.2000		
23	WG20004-025	28-Jul-2021 17:04:56	072821030.d	Client	FB-08-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
24	WG20004-026	28-Jul-2021 17:15:33	072821031.d	Client	FB-07-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		SUR: TeDA(LOW), INSUFFICIENT SAMPLE, NCM
25	WG22011-001	28-Jul-2021 17:26:09	072821032.d	Client	AOPC24-W89-1-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
26	ID CCV 1000A_SVLC-1573	28-Jul-2021 17:36:43	072821033.d	CCV					Analytes	L-5	1.00		
27	CCB 2	28-Jul-2021 17:47:22	072821034.d	InstBlk					Surrogates	Smp	0.1100		
28	WG22011-002	28-Jul-2021 17:58:05	072821035.d	Client	AOPC3-W7-3-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
29	WG22011-003	28-Jul-2021 18:08:42	072821036.d	Client	AOPC3-W7-3-071921-FD	Aqueous	1	10188	Surrogates	Smp	0.1100		
30	WG22011-004	28-Jul-2021 18:19:21	072821037.d	Client	AOPC3-W7-11-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
31	WG22011-005	28-Jul-2021 18:30:02	072821038.d	Client	AOPC03-W7-13-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd),ncm
32	WG22011-006	28-Jul-2021 18:40:36	072821039.d	Client	AOPC03-UST-MW-02-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd),ncm
33	WG22011-007	28-Jul-2021 18:51:11	072821040.d	Client	AOPC21-W4-14-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd)6:2(detect),8:2(nd),confirmed, ncm
34	WG22011-007DU	28-Jul-2021 19:01:47	072821041.d	Client		Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd)6:2(detect),8:2(nd),ncm parent sample
35	WG22011-008	28-Jul-2021 19:12:26	072821042.d	Client	AOPC21-W6-6-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
36	WG22011-009	28-Jul-2021 19:23:04	072821043.d	Client	FB-09-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
37	ID CCV 1000B_SVLC-1573	28-Jul-2021 19:33:41	072821044.d	CCV					Analytes	L-5	1.00		
38	CCB 3	28-Jul-2021 19:44:21	072821045.d	InstBlk					Surrogates	Smp	0.1100		
39	WQ10065-001	28-Jul-2021 19:54:59	072821046.d	MBlk		Soil	1	10065	Surrogates	Smp	0.1100		
40	WQ10065-002	28-Jul-2021 20:05:40	072821047.d	LCS		Soil	1	10065	Analytes	100x PDS	0.1000		
41	WG20002-020	28-Jul-2021 20:16:22	072821048.d	Client	AOPC2-SB03-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		

Report Date: 29-Jul-2021 18:55:03 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\072821-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
42	WG20002-020MS	28-Jul-2021 20:26:59	072821049.d	MS		Soil	1	10065	Analytes	100x PDS	0.1000		
43	WG20002-020MD	28-Jul-2021 20:37:37	072821050.d	MSD		Soil	1	10065	Analytes	100x PDS	0.1000		
44	WG20002-022	28-Jul-2021 20:48:15	072821051.d	Client	AOPC2-SB04-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
45	WG20002-023	28-Jul-2021 20:58:51	072821052.d	Client	AOPC2-SB05-0-0.5	Soil	1	10065	Surrogates	Smp	0.1100		
46	WG20002-024	28-Jul-2021 21:09:28	072821053.d	Client	AOPC2-SB05-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
47	WG20002-025	28-Jul-2021 21:20:07	072821054.d	Client	AOPC2-SB06-0-0.5	Soil	1	10065	Surrogates	Smp	0.1100		
48	WG20002-026	28-Jul-2021 21:30:47	072821055.d	Client	AOPC2-SB06-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
49	WG20002-027	28-Jul-2021 21:41:27	072821056.d	Client	AOPC2-SB07-0-0.5	Soil	1	10065	Surrogates	Smp	0.1100		
50	WG20002-028	28-Jul-2021 21:52:06	072821057.d	Client	AOPC2-SB07-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
51	WG22019-001	28-Jul-2021 22:02:46	072821058.d	Client	RRAD-FFTA-01-SE-072021	Soil	1	10065	Surrogates	Smp	0.1100		
52	WG22019-001MS	28-Jul-2021 22:13:22	072821059.d	MS		Soil	1	10065	Analytes	100x PDS	0.1000		
53	WG22019-001MD	28-Jul-2021 22:23:58	072821060.d	MSD		Soil	1	10065	Analytes	100x PDS	0.1000		
54	WG22019-002	28-Jul-2021 22:34:36	072821061.d	Client	RRAD-FD-01-SE-072021	Soil	1	10065	Surrogates	Smp	0.1100		
55	ID CCV 1000C_SVLC-1573	28-Jul-2021 22:45:16	072821062.d	CCV					Analytes	L-5	1.00		MeFOSA(139%)

Analyst: MOM
Status: Open

Percent Solids Analytical Batch: 99497

%Solids SOP - % Solids

((DishPlusDryWt or 1st or 2nd or 3rd Rewt - DishWt)/WetWt) * 100

Printed: 7/21/2021 5:11:42 PM

Start Date: 07/20/2021 2309 **End Date:** 07/21/2021 1518 **Balance ID:** Balance #12

Oven ID: Drying Oven # 9 **Oven Temperature Start (°C):** 104 **Oven Temperature End (°C):** 105

Sample ID	Cup	QC Code	Run	Dish Wt (g)	Dish+Wet Wt (g)	Wet Wt (g)	Dish+Dry Wt (g)	1st Rewt (g)	2nd Rewt (g)	3rd Rewt (g)	Final Result (mg/L)	Reported Result (%)	RPD (%)	Qual
WQ99497-008		ICV	1	0	1.9982	1.9982	1.9984	0	0	0	100.01			
								Comments: Weight set ID: 2B; Snap cup ID: 21-1425						
WG20002-001		Sample	1	4.334	12.6352	8.3012	10.8514	0	0	0	78.5115	78.5		
WG20002-002		Sample	1	4.334	11.9231	7.5891	11.3551	0	0	0	92.5155	92.5		
WG20002-003		Sample	1	4.334	12.7702	8.4362	10.7478	0	0	0	76.0271	76.0		
WG20002-004		Sample	1	4.334	12.1163	7.7823	10.8301	0	0	0	83.4727	83.5		
WG20002-005		Sample	1	4.334	12.8066	8.4726	12.0236	0	0	0	90.7584	90.8		
WG20002-006		Sample	1	4.334	13.636	9.3020	12.3901	0	0	0	86.6061	86.6		
WG20002-007		Sample	1	4.334	13.4361	9.1021	13.2766	0	0	0	98.2476	98.2		
WG20002-008		Sample	1	4.334	12.4036	8.0696	10.9365	0	0	0	81.8194	81.8		
WG20002-009		Sample	1	4.334	13.9341	9.6001	13.7864	0	0	0	98.4614	98.5		
WG20002-010		Sample	1	4.334	11.9484	7.6144	11.0077	0	0	0	87.6457	87.6		
WG20002-011		Sample	1	4.334	12.6371	8.3031	12.1317	0	0	0	93.9131	93.9		
WG20002-012		Sample	1	4.334	11.2489	6.9149	10.0266	0	0	0	82.3236	82.3		
WG20002-013		Sample	1	4.334	12.7226	8.3886	12.5648	0	0	0	98.1188	98.1		
WG20002-014		Sample	1	4.334	13.2217	8.8877	11.1915	0	0	0	77.1571	77.2		
WG20002-015		Sample	1	4.334	13.2307	8.8967	11.9337	0	0	0	85.4215	85.4		
WG20002-016		Sample	1	4.334	13.5604	9.2264	12.0929	0	0	0	84.0945	84.1		
WG20002-017		Sample	1	4.334	12.8168	8.4828	11.7093	0	0	0	86.9441	86.9		
WG20002-018		Sample	1	4.334	11.2811	6.9471	10.2514	0	0	0	85.1779	85.2		
WG20002-019		Sample	1	4.334	12.0737	7.7397	10.5221	0	0	0	79.9527	80.0		
WG20002-020		Sample	1	4.334	12.8526	8.5186	11.3344	0	0	0	82.1778	82.2		
WG20002-021		Sample	1	4.334	12.8003	8.4663	11.0044	0	0	0	78.7876	78.8		
WG20002-022		Sample	1	4.334	13.1492	8.8152	11.8667	0	0	0	85.4512	85.5		
WG20002-023		Sample	1	4.334	13.6154	9.2814	12.5918	0	0	0	88.9714	89.0		

Analyst: MOM
Status: Open

Percent Solids Analytical Batch: 99497

%Solids SOP - % Solids

((DishPlusDryWt or 1st or 2nd or 3rd Rewt - DishWt)/WetWt) * 100

Printed: 7/21/2021 5:11:42 PM

Start Date: 07/20/2021 2309 **End Date:** 07/21/2021 1518 **Balance ID:** Balance #12

Oven ID: Drying Oven # 9 **Oven Temperature Start (°C):** 104 **Oven Temperature End (°C):** 105

Sample ID	Cup	QC Code	Run	Dish Wt (g)	Dish+Wet Wt (g)	Wet Wt (g)	Dish+Dry Wt (g)	1st Rewt (g)	2nd Rewt (g)	3rd Rewt (g)	Final Result (mg/L)	Reported Result (%)	RPD (%)	Qual
WG20002-024		Sample	1	4.334	11.3591	7.0251	10.1503	0	0	0	82.7931	82.8		
WG20002-025		Sample	1	4.334	13.6664	9.3324	12.8647	0	0	0	91.4094	91.4		
WG20002-026		Sample	1	4.334	12.6613	8.3273	11.3541	0	0	0	84.3022	84.3		
WG20002-027		Sample	1	4.334	11.8283	7.4943	10.3906	0	0	0	80.816	80.8		
WG20002-028		Sample	1	4.334	12.8201	8.4861	11.5848	0	0	0	85.4432	85.4		
WG20007-001		Sample	1	4.334	13.3134	8.9794	11.4722	0	0	0	79.4952	79.5		
WG20007-002		Sample	1	4.334	12.6072	8.2732	9.9422	0	0	0	67.7875	67.8		
WG20007-003		Sample	1	4.334	11.1701	6.8361	9.8835	0	0	0	81.1793	81.2		
WG20007-004		Sample	1	4.334	13.0526	8.7186	10.756	0	0	0	73.6586	73.7		
WG20018-001		Sample	1	4.334	12.7488	8.4148	6.1316	0	0	0	21.3623	21.4		
WG20028-001		Sample	1	4.334	13.5663	9.2323	4.4646	0	0	0	1.4145	1.41		
WG20035-001		Sample	1	4.334	12.7842	8.4502	11.2104	0	0	0	81.3755	81.4		
WG20035-002		Sample	1	4.334	12.1972	7.8632	11.092	0	0	0	85.9446	85.9		
WG20035-003		Sample	1	4.334	13.1992	8.8652	11.2064	0	0	0	77.521	77.5		
WG20035-004		Sample	1	4.334	13.0789	8.7449	11.635	0	0	0	83.4886	83.5		
WG20035-005		Sample	1	4.334	14.0919	9.7579	11.8003	0	0	0	76.5154	76.5		
WG20035-006		Sample	1	4.334	11.6006	7.2666	10.2798	0	0	0	81.8236	81.8		
WQ99497-011		CCV	1	0	1.9982	1.9982	1.9985	0	0	0	100.015			

Total Items: 42 (40 samples)

(end of report)

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **D. WILSON** **DATE:** **SEPTEMBER 16, 2021**

FROM: **MICHELLE L. WOEBER** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – POLY- AND PERFLUOROALKYL SUBSTANCES**
NASA-AMES
SAMPLE DELIVERY GROUP (SDG) WG20004

SAMPLES: 26/Aqueous/PFAS

AOPC1,7-PZA1-5C-071521	AOPC1,7-WU4-9-071521	AOPC1-11N21A1-071221
AOPC18-11E02A-071221	AOPC18-WNB-7-071221	AOPC24-171A-071621
AOPC24-64A-071321	AOPC24-WU4-1-071321	AOPC25-15B10A-071321
AOPC25-15H12A-071321	AOPC3-W19-2-071621	AOPC3-W7-10-071621
AOPC3-W7-9-071421	AOPC5-14039A-071421	AOPC5-14D12A-071621
AOPC5-14D12A-071621-FD	AOPC5-WNB-14-071421	AOPC5-WU4-19-071421
AOPC6-WV4-18-071221	AOPC8-W11-2-071221	FB-05-071321
FB-06-071421	FB-07-071521	FB-07-071621
FB-08-071621	FB04-071221	

Overview

The sample set for NASA-Ames, SDG WG20004, consisted of twenty (20) aqueous environmental samples and six (6) field blanks. All samples were analyzed for poly-and perfluoroalkyl substances (PFAS). One field duplicate pair was associated with this SDG: AOPC5-14D12A-071621/AOPC5-14D12A-071621-FD.

The samples were collected by Tetra Tech, Inc. on July 12-16, 2021 and analyzed by Pace Analytical Services. All analyses were conducted in accordance with Department of Defense ((DOD)/Department of Energy (DOE) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3, PFAS using LC/MS/MS Appendix B Table B-15 (2019). The data contained in this SDG was validated via EPA Stage 4 with regard to the following parameters:

- Data completeness
- Hold times/Sample Preservation
* Mass Calibration
* LC/MS/MS System Tuning and Performance
* Mass Spectral Acquisition Rate
* Instrument Sensitivity Check
* Ion Transition Check
- Ion Ratios
- Initial/Continuing Calibrations
- Laboratory Instrument/Method and Field Blank Results
- Extraction Internal Standard Recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate Results
- Matrix Spike/Matrix Spike Duplicate Results
* Laboratory Duplicate Precision
* Field Duplicate Precision
* Compound Identification

* • Compound Quantitation
* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, and documentation supporting these findings is presented in Appendix C.

INITIAL/CONTINUING CALIBRATIONS

The Continuing Calibration Verification (CCV) performed on 07/26/2021 @ 16:40 had a Percent Recovery (%R) for 8:2 fluorotelomer sulfonate (8:2FTS) which exceeded the 130% quality control limit. Samples AOPC18-11E02A-071221, AOPC18-WNB-7-071221, AOPC24-64A-071321, AOPC24-WU4-1-071321, AOPC25-15B10A-071321, AOPC25-15H12A-071321, AOPC5-WU4-19-071421, FB-05-071321, and FB04-071221 were affected. The non-detected results reported for 8:2FTS in the affected samples were qualified as estimated, (UJ).

ION RATIOS

The ion ratio %Rs for perfluorooctanesulfonic acid (PFOS) in samples AOPC8-W11-2-071221 and AOPC3-W19-2-071621 were outside the 50%-150% quality control limits. In addition, the ion ratio %R for 6:2FTS was outside the quality control limits in sample AOPC3-W19-2-071621. The detected results reported for these compounds in these samples were qualified as estimated, (J).

EXTRACTED INTERNAL STANDARD RECOVERIES

The %R for extracted internal standard compound, 13C2-4:2FTS, was above the 150% quality control limit in sample AOPC8-W11-2-071221. In addition, the %Rs for d5-N-ethylperfluorooctane sulfonamidoacetate (NEFOSA) and d3-N-methylperfluorooctane sulfonamidoacetate (NMFOSA) were below 50% but greater than 20%. This sample was not re-extracted/reanalyzed. No action was taken for 13C2-4:2FTS because the associated compound was not detected in this sample. The non-detected results reported for the compounds associated with d5-NEFOSA and d3-NMFOSA were qualified as estimated, (UJ).

The %R for the extracted internal standard compound, 13C2-perfluorotetradecanoic acid (PFTeA), was below the lower quality control limit in sample FB-07-071621. The sample was not re-extracted/reanalyzed. The non-detected result reported for the compound associated with this extracted internal standard was qualified as estimated, (UJ).

The %R for extracted internal standard compound, 13C2-4:2FTS, was above the 150% quality control limit in sample AOPC5-14039A-071421. In addition, the %Rs for 13C3-perfluorohexanesulfonic acid (PFHxS), 13C8-PFOS, and 13C9-perfluorononanoic acid (PFNA) were below 50% but greater than 20%. The sample was reanalyzed at a 100X dilution with acceptable extracted internal standard %Rs. No action was taken for the compound associated with 13C2-4:2FTS because this compound was not detected in this sample. No action was taken for affected compounds, PFHxS and PFOS, because these compounds were reported from the diluted analysis. The detected result reported the affected compound, PFNA, from the initial analysis was qualified as estimated with a high bias, (J+).

The %Rs for extracted internal standard compounds, 13C2-4:2FTS and 13C2-6:2FTS, were above the 150% quality control limit in sample AOPC3-W7-9-071421. The sample was re-extracted outside the 14-day holding time and reanalyzed with similar results. The results from the initial analysis were used in the data validation due to the missed holding time. No action was taken for the associated compound, 4:2FTS, because this compound was not detected in this sample. The detected result reported for the associated compound, 6:2FTS, was qualified as estimated with a low bias, (J-).

LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RESULTS

The Laboratory Control Sample (LCS) analysis associated with preparation batch #10188 had a %R for perfluoropentanesulfonic acid (PFPeS) which exceeded the upper quality control limit. The detected result reported for PFPeS in sample AOPC24-171A-071621 was qualified as estimated, (J), due to conflicting directional bias. No action was taken for samples AOPC5-14D12A-071621 and AOPC5-14D12A-071621-FD because these samples were reanalyzed for PFPeS in preparation batch #10648.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

The Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses of sample AOPC1,7-PZA1-5C-071521 had MSD %Rs for 8:2FTS, perfluorobutanesulfonic acid (PFBS), perfluorooctane sulfonamide (FOSA), and PFNA which exceeded the upper quality control limits. The detected result reported for PFBS in the parent sample was qualified as estimated with a high bias, (J+). The remaining compounds were not detected in the parent sample; therefore, no action was necessary.

Additional Comments

Sample FB-07-071621 was not listed on the sample Chain of Custody (COC) but was analyzed by the laboratory for PFAS.

PFOS was detected below the LOQ in laboratory method blank, WQ10113-001, associated with preparation batch #10113. No action was taken because the detected results reported for PFOS in the associated environmental samples were greater than the LOQ and 5X the concentration of the blank. No action was taken for the detected result reported in the associated field blank, FB-06-071421, because field blanks are not qualified for laboratory blank contamination.

6:2FTS was detected above the LOQ in the field blank, FB-07-071521. No action was taken because the detected result reported for this compound was either greater than the LOQ and 5X the concentration of the blank or not detected in the samples sampled on 07/15/2021.

The %R for the extracted internal standard compound, 13C2-6:2FTS, was above the upper quality control limit in sample FB-05-071321. No action was taken because the compound associated with extracted internal standard was not detected in this sample.

The MS analyses performed on sample AOPC24-171A-071621 had %Rs for perfluorodecanoic acid (PFDA), PFNA, and perfluoroundecanoic acid (PFUnA) above the upper quality control limits. No action was necessary because these compounds were not detected in the parent sample.

The Relative Percent Difference (RPD) for pentadecafluorooctanoic acid (PFOA) in the laboratory duplicate analysis of sample AOPC18-WNB-7-071221 exceeded the 20% quality control criterion. No action was taken because the detected results were below the LOQ.

Detected results reported below the limit of quantitation (LOQ) but above the Detection Limit (DL) were qualified as estimated, (J). Non-detected results were reported to the limit of detection (LOD).

Instances of manual integrations were present in this data package. All manual integrations were documented by the laboratory and are noted in the raw data of the original data package.

The following samples were analyzed at a dilution:

Sample	Dilution
AOPC1-11N21A1-071221	50X
AOPC6-WV4-18-071221	10X

The reporting limits of the non-detected results were elevated.

PFBS, PFHxA, PFHxS, PFPeS, and PFOS were reported from the 10X dilution of sample AOPC5-WU4-19-071421.

PFHxA, PFHxS, and PFOS exceeded the calibration range of the instrument in the initial analysis of sample AOPC5-14039A-071421. The sample was diluted 100X. The results from the dilution were used for these compounds in the data validation.

Executive Summary

Laboratory Performance Issues: A CCV had a %R above the quality control limit. Ion ratio %Rs were noncompliant in two samples. PFOS was detected in a laboratory method blank. Extracted internal standards were noncompliant. A LCS %R was high.

Other Factors Affecting Data Quality: The MS/MSD analyses had high %Rs. Some samples were diluted. Detected results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled "Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis be QSM Table B15" (May 1, 2020). The text of this report has been formulated to address only those areas affecting data quality.

Michelle L. Woeber

Tetra Tech, Inc.
Michelle L. Woeber
Chemist/Data Validator

Joseph A. Samchuck

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

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

Data Qualifier Definitions

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

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

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

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

PROJ_NO: 09033A	NSAMPLE	AOPC1,7-PZA1-5C-071521			AOPC1,7-WU4-9-071521			AOPC1-11N21A1-071221			AOPC18-11E02A-071221		
SDG: WG20004	LAB_ID	WG20004-018			WG20004-017			WG20004-003			WG20004-001		
FRACTION: PFAS	SAMP_DATE	7/15/2021			7/15/2021			7/12/2021			7/12/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.7	U		3.6	U		180	U		3.5	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.7	U		3.6	U		180	U		3.5	U	
4:2 FLUOROTELOMER SULFONATE		3.7	U		3.6	U		180	U		3.5	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		3.7	U		91			260	J	P	47		
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.7	U		3.6	U		180	U		3.5	UJ	C
9CL-PF3ONS		3.7	U		3.6	U		180	U		3.5	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.7	U		3.6	U		180	U		3.5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.7	U		3.6	U		180	U		3.5	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.7	U		3.6	U		180	U		3.5	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		38			5.1			350			34		
PERFLUOROBUTANESULFONIC ACID (PFBS)		21	J+	D	7.1			520			18		
PERFLUOROBUTANOIC ACID (PFBA)		13			4.2			190			73		
PERFLUORODECANESULFONIC ACID (PFDS)		1.9	U		1.8	U		90	U		1.8	U	
PERFLUORODECANOIC ACID (PFDA)		1.9	U		1.8	U		90	U		1.8	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.9	U		1.8	U		90	U		1.8	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		2.4	J	P	1.8	U		200			4.2		
PERFLUOROHEPTANOIC ACID (PFHPA)		7.4			2.1	J	P	160	J	P	42		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		250			34			3300			120		
PERFLUOROHEXANOIC ACID (PFHXA)		22			6			900			240		
PERFLUORONONANESULFONIC ACID (PFNS)		1.9	U		1.8	U		90	U		1.8	U	
PERFLUORONONANOIC ACID (PFNA)		1.9	U		1.8	U		90	U		2.9	J	P
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.9	U		1.8	U		90	U		1.8	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		110			18			7700			470		
PERFLUOROPENTANESULFONIC ACID (PFPES)		27			7.8			490			12		

PROJ_NO: 09033A	NSAMPLE	AOPC18-WNB-7-071221			AOPC24-171A-071621			AOPC24-64A-071321			AOPC24-WU4-1-071321		
SDG: WG20004	LAB_ID	WG20004-002			WG20004-024			WG20004-009			WG20004-010		
FRACTION: PFAS	SAMP_DATE	7/12/2021			7/16/2021			7/13/2021			7/13/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.9	U		3.8	U		3.9	U		4.4	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.9	U		3.8	U		3.9	U		4.4	U	
4:2 FLUOROTELOMER SULFONATE		3.9	U		3.8	U		3.9	U		4.4	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		58			3.8	U		9.6			4.9	J	P
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.9	UJ	C	3.8	U		3.9	UJ	C	4.4	UJ	C
9CL-PF3ONS		3.9	U		3.8	U		3.9	U		4.4	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.9	U		3.8	U		3.9	U		4.4	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.9	U		3.8	U		3.9	U		4.4	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.9	U		3.8	U		3.9	U		4.4	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.6	J	P	2.7	J	P	1.9	U		3.3	J	P
PERFLUOROBUTANESULFONIC ACID (PFBS)		12			6.2			5.7			8.4		
PERFLUOROBUTANOIC ACID (PFBA)		12			4.4			1.5	J	P	5		
PERFLUORODECANESULFONIC ACID (PFDS)		2	U		1.9	U		1.9	U		2.2	U	
PERFLUORODECANOIC ACID (PFDA)		2	U		1.9	U		1.9	U		2.2	U	
PERFLUORODODECANOIC ACID (PFDOA)		2	U		1.9	U		1.9	U		2.2	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		2	U		1.9	U		1.9	U		2.2	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		2	U		1.9	U		1.9	U		1.6	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		32			7			11			25		
PERFLUOROHEXANOIC ACID (PFHXA)		2.2	J	P	1.5	J	P	1.9	U		7.2		
PERFLUORONONANESULFONIC ACID (PFNS)		2	U		1.9	U		1.9	U		2.2	U	
PERFLUORONONANOIC ACID (PFNA)		2	U		1.9	U		1.9	U		2.2	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2	U		1.9	U		1.9	U		2.2	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		55			4.2			3.8			8		
PERFLUOROPENTANESULFONIC ACID (PFPES)		8.3			2	J	EP	2.7	J	P	6.4		

PROJ_NO: 09033A	NSAMPLE	AOPC25-15B10A-071321			AOPC25-15H12A-071321			AOPC3-W19-2-071621			AOPC3-W7-10-071621		
SDG: WG20004	LAB_ID	WG20004-008			WG20004-007			WG20004-022			WG20004-023		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/16/2021			7/16/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.6	U		4.2	U		3.4	U		3.4	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.6	U		4.2	U		3.4	U		3.4	U	
4:2 FLUOROTELOMER SULFONATE		3.6	U		4.2	U		3.4	U		3.4	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		3.6	U		540			2	J	PQ	12		
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.6	UJ	C	4.2	UJ	C	3.4	U		3.4	U	
9CL-PF3ONS		3.6	U		4.2	U		3.4	U		3.4	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.6	U		4.2	U		3.4	U		3.4	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.6	U		4.2	U		3.4	U		3.4	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.6	U		4.2	U		3.4	U		3.4	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.2	J	P	2.2	J	P	4.1			4.6		
PERFLUOROBUTANESULFONIC ACID (PFBS)		4.4			5.7			1.7	U		0.87	J	P
PERFLUOROBUTANOIC ACID (PFBA)		2.8	J	P	3.3	J	P	1.4	J	P	2	J	P
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U		2.1	U		1.7	U		1.7	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U		2.1	U		1.7	U		1.7	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U		2.1	U		1.7	U		1.7	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.8	U		2.1	U		1.7	U		1.7	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		1.8	U		1	J	P	1.7	U		1.4	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		8.6			12			8.1			10		
PERFLUOROHEXANOIC ACID (PFHXA)		1.6	J	P	2	J	P	1.1	J	P	1	J	P
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U		2.1	U		1.7	U		1.7	U	
PERFLUORONONANOIC ACID (PFNA)		1.8	U		2.1	U		1.7	U		1.7	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.8	U		2.1	U		1.7	U		1.7	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		4.3			9			2.3	J	PQ	57		
PERFLUOROPENTANESULFONIC ACID (PFPES)		1.6	J	P	1.9	J	P	1.7	U		1.7	U	

PROJ_NO: 09033A	NSAMPLE	AOPC3-W7-9-071421			AOPC5-14039A-071421			AOPC5-14039A-071421-DL			AOPC5-14D12A-071621		
SDG: WG20004	LAB_ID	WG20004-014			WG20004-013			WG20004-013-DL			WG20004-020		
FRACTION: PFAS	SAMP_DATE	7/14/2021			7/14/2021			7/14/2021			7/16/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		4.2	U		3.9	U					3.7	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		4.2	U		3.9	U					3.7	U	
4:2 FLUOROTELOMER SULFONATE		4.2	U		3.9	U					3.7	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		14	J-	N	480						6.2	J	P
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		4.2	U		27						3.7	U	
9CL-PF3ONS		4.2	U		3.9	U					3.7	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		4.2	U		3.9	U					3.7	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		4.2	U		3.9	U					3.7	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		4.2	U		3.9	U					3.7	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		62			250						8.3		
PERFLUOROBUTANESULFONIC ACID (PFBS)		14			310						11		
PERFLUOROBUTANOIC ACID (PFBA)		45			270						9.2		
PERFLUORODECANESULFONIC ACID (PFDS)		2.1	U		2	U					1.9	U	
PERFLUORODECANOIC ACID (PFDA)		5.5			2.7	J	P				1.9	U	
PERFLUORODODECANOIC ACID (PFDOA)		2.1	U		2	U					1.9	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		4.9			720						1.9	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		51			130						3	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		180						3900			24		
PERFLUOROHEXANOIC ACID (PFHXA)		54						1600			7.7		
PERFLUORONONANESULFONIC ACID (PFNS)		2.1	U		50						1.9	U	
PERFLUORONONANOIC ACID (PFNA)		11			8.7	J+	N				6.6		
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2.1	U		23						1.9	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		160						40000			14		
PERFLUOROPENTANESULFONIC ACID (PFPES)		19			330						5.1		

PROJ_NO: 09033A	NSAMPLE	AOPC5-14D12A-071621-FD			AOPC5-WNB-14-071421			AOPC5-WU4-19-071421			AOPC6-WV4-18-071221		
SDG: WG20004	LAB_ID	WG20004-021			WG20004-015			WG20004-012			WG20004-005		
FRACTION: PFAS	SAMP_DATE	7/16/2021			7/14/2021			7/14/2021			7/12/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	AOPC5-14D12A-071621											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.8	U		3.8	U		3.5	U		37	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.8	U		3.8	U		3.5	U		37	U	
4:2 FLUOROTELOMER SULFONATE		3.8	U		3.8	U		3.5	U		37	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		5.6	J	P	130			620			330		
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.8	U		18			3.5	UJ	C	20	J	P
9CL-PF3ONS		3.8	U		3.8	U		3.5	U		37	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.8	U		3.8	U		3.5	U		37	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.8	U		3.8	U		3.5	U		37	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.8	U		3.8	U		3.5	U		37	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		8.3			120			330			170		
PERFLUOROBUTANESULFONIC ACID (PFBS)		12			29			1500			490		
PERFLUOROBUTANOIC ACID (PFBA)		9.7			150			260			150		
PERFLUORODECANESULFONIC ACID (PFDS)		1.9	U		1.9	U		1.7	U		19	U	
PERFLUORODECANOIC ACID (PFDA)		1.9	U		8.7			4.2			19	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.9	U		1.3	J	P	1.7	U		19	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.9	U		7.2			170			91		
PERFLUOROHEPTANOIC ACID (PFHPA)		2.5	J	P	190			230			130		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		25			220			4400			1600		
PERFLUOROHEXANOIC ACID (PFHXA)		7.6			550			1300			720		
PERFLUORONONANESULFONIC ACID (PFNS)		1.9	U		1.9	U		1.7	U		19	U	
PERFLUORONONANOIC ACID (PFNA)		7.5			27			7.6			14	J	P
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.9	U		1.9	U		2.7	J	P	19	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		16			410			3300			3300		
PERFLUOROPENTANESULFONIC ACID (PFPES)		5.3			25			1200			350		

PROJ_NO: 09033A	NSAMPLE	AOPC8-W11-2-071221			FB04-071221			FB-05-071321			FB-06-071421		
SDG: WG20004	LAB_ID	WG20004-004			WG20004-006			WG20004-011			WG20004-016		
FRACTION: PFAS	SAMP_DATE	7/12/2021			7/12/2021			7/13/2021			7/14/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		4.2	U		3.5	U		3.7	U		3.7	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		4.2	U		3.5	U		3.7	U		3.7	U	
4:2 FLUOROTELOMER SULFONATE		4.2	U		3.5	U		3.7	U		3.7	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		50			3.5	U		3.7	U		3.7	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		4.2	U		3.5	UJ	C	3.7	UJ	C	3.7	U	
9CL-PF3ONS		4.2	U		3.5	U		3.7	U		3.7	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		4.2	U		3.5	U		3.7	U		3.7	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		4.2	UJ	N	3.5	U		3.7	U		3.7	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		4.2	UJ	N	3.5	U		3.7	U		3.7	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		110			1.8	U		1.8	U		1.9	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		5.8			1.8	U		1.8	U		1.9	U	
PERFLUOROBUTANOIC ACID (PFBA)		48			1.8	U		1.8	U		1.9	U	
PERFLUORODECANESULFONIC ACID (PFDS)		2.1	U		1.8	U		1.8	U		1.9	U	
PERFLUORODECANOIC ACID (PFDA)		2.1	U		1.8	U		1.8	U		1.9	U	
PERFLUORODODECANOIC ACID (PFDOA)		2.1	U		1.8	U		1.8	U		1.9	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		2.1	U		1.8	U		1.8	U		1.9	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		7.9			1.8	U		1.8	U		1.9	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		16			1.8	U		1.8	U		1.9	U	
PERFLUOROHEXANOIC ACID (PFHXA)		8.4			1.8	U		1.8	U		1.9	U	
PERFLUORONONANESULFONIC ACID (PFNS)		2.1	U		1.8	U		1.8	U		1.9	U	
PERFLUORONONANOIC ACID (PFNA)		2.1	U		1.8	U		1.8	U		1.9	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2.1	U		1.8	U		1.8	U		1.9	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		3	J	PQ	1.8	U		1.8	U		3.9		
PERFLUOROPENTANESULFONIC ACID (PFPES)		2.1	U		1.8	U		1.8	U		1.9	U	

PROJ_NO: 09033A	NSAMPLE	FB-07-071521			FB-07-071621			FB-08-071621		
SDG: WG20004	LAB_ID	WG20004-019			WG20004-026			WG20004-025		
FRACTION: PFAS	SAMP_DATE	7/15/2021			7/15/2021			7/16/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		4	U		3.9	U		3.7	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		4	U		3.9	U		3.7	U	
4:2 FLUOROTELOMER SULFONATE		4	U		3.9	U		3.7	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		12			3.9	U		3.7	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		4	U		3.9	U		3.7	U	
9CL-PF3ONS		4	U		3.9	U		3.7	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		4	U		3.9	U		3.7	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		4	U		3.9	U		3.7	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		4	U		3.9	U		3.7	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		2	U		1.9	U		1.9	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		2	U		1.9	U		1.9	U	
PERFLUOROBUTANOIC ACID (PFBA)		2	U		1.9	U		1.9	U	
PERFLUORODECANESULFONIC ACID (PFDS)		2	U		1.9	U		1.9	U	
PERFLUORODECANOIC ACID (PFDA)		2	U		1.9	U		1.9	U	
PERFLUORODODECANOIC ACID (PFDOA)		2	U		1.9	U		1.9	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		2	U		1.9	U		1.9	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		2	U		1.9	U		1.9	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2	U		1.9	U		1.9	U	
PERFLUOROHEXANOIC ACID (PFHXA)		2	U		1.9	U		1.9	U	
PERFLUORONONANESULFONIC ACID (PFNS)		2	U		1.9	U		1.9	U	
PERFLUORONONANOIC ACID (PFNA)		2	U		1.9	U		1.9	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2	U		1.9	U		1.9	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2	U		1.9	U		1.9	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		2	U		1.9	U		1.9	U	

PROJ_NO: 09033A	NSAMPLE	AOPC1,7-PZA1-5C-071521			AOPC1,7-WU4-9-071521			AOPC1-11N21A1-071221			AOPC18-11E02A-071221		
SDG: WG20004	LAB_ID	WG20004-018			WG20004-017			WG20004-003			WG20004-001		
FRACTION: PFAS	SAMP_DATE	7/15/2021			7/15/2021			7/12/2021			7/12/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		17			4.7			340			230		
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.9	U		1.8	U		90	U		1.8	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.9	U		1.8	U		90	U		1.8	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.9	U		1.8	U		90	U		1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC18-WNB-7-071221			AOPC24-171A-071621			AOPC24-64A-071321			AOPC24-WU4-1-071321		
SDG: WG20004	LAB_ID	WG20004-002			WG20004-024			WG20004-009			WG20004-010		
FRACTION: PFAS	SAMP_DATE	7/12/2021			7/16/2021			7/13/2021			7/13/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.8	J	P	1.7	J	P	1.1	J	P	4.9		
PERFLUOROTETRADECANOIC ACID (PFTEA)		2	U		1.9	U		1.9	U		2.2	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2	U		1.9	U		1.9	U		2.2	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		2	U		1.9	U		1.9	U		2.2	U	

PROJ_NO: 09033A	NSAMPLE	AOPC25-15B10A-071321			AOPC25-15H12A-071321			AOPC3-W19-2-071621			AOPC3-W7-10-071621		
SDG: WG20004	LAB_ID	WG20004-008			WG20004-007			WG20004-022			WG20004-023		
FRACTION: PFAS	SAMP_DATE	7/13/2021			7/13/2021			7/16/2021			7/16/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.8	J	P	1.8	J	P	1.7	U		1.7	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U		2.1	U		1.7	U		1.7	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U		2.1	U		1.7	U		1.7	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U		2.1	U		1.7	U		1.7	U	

PROJ_NO: 09033A	NSAMPLE	AOPC3-W7-9-071421			AOPC5-14039A-071421			AOPC5-14039A-071421-DL			AOPC5-14D12A-071621		
SDG: WG20004	LAB_ID	WG20004-014			WG20004-013			WG20004-013-DL			WG20004-020		
FRACTION: PFAS	SAMP_DATE	7/14/2021			7/14/2021			7/14/2021			7/16/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		56			560						8.3		
PERFLUOROTETRADECANOIC ACID (PFTEA)		2.1	U		2	U					1.9	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2.1	U		2	U					1.9	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		2.1	U		2	U					1.9	U	

PROJ_NO: 09033A	NSAMPLE	AOPC5-14D12A-071621-FD			AOPC5-WNB-14-071421			AOPC5-WU4-19-071421			AOPC6-WV4-18-071221		
SDG: WG20004	LAB_ID	WG20004-021			WG20004-015			WG20004-012			WG20004-005		
FRACTION: PFAS	SAMP_DATE	7/16/2021			7/14/2021			7/14/2021			7/12/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	AOPC5-14D12A-071621											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		8.6			540			370			320		
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.9	U		1.9	U		1.7	U		19	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.9	U		1.9	U		1.7	U		19	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.9	U		2.2	J	P	1.7	U		19	U	

PROJ_NO: 09033A	NSAMPLE	AOPC8-W11-2-071221			FB04-071221			FB-05-071321			FB-06-071421		
SDG: WG20004	LAB_ID	WG20004-004			WG20004-006			WG20004-011			WG20004-016		
FRACTION: PFAS	SAMP_DATE	7/12/2021			7/12/2021			7/13/2021			7/14/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		7.6			1.8	U		1.8	U		1.9	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		2.1	U		1.8	U		1.8	U		1.9	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2.1	U		1.8	U		1.8	U		1.9	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		2.1	U		1.8	U		1.8	U		1.9	U	

PROJ_NO: 09033A	NSAMPLE	FB-07-071521			FB-07-071621			FB-08-071621		
SDG: WG20004	LAB_ID	WG20004-019			WG20004-026			WG20004-025		
FRACTION: PFAS	SAMP_DATE	7/15/2021			7/15/2021			7/16/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		2	U		1.9	U		1.9	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		2	U		1.9	U		1.9	UJ	N
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2	U		1.9	U		1.9	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		2	U		1.9	U		1.9	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-001
Description: AOPC18-11E02A-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1315
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1536	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	47		7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	18		3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	4.2		3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	12		3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	120		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	73	S	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	42		3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	240	S	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.9	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	34		3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	230	S	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	470	S	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		129	50-150
13C2_6:2FTS		144	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		105	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		103	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		97	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech	Laboratory ID: WG20004-001
Description: AOPC18-11E02A-071221	Matrix: Aqueous
Date Sampled: 07/12/2021 1315	Project Name: NASA ARC PFAS
Date Received: 07/20/2021	Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		113	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		106	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		109	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-002
Description: AOPC18-WNB-7-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1320
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1557	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	58		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	12		3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	8.3		3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	32		3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.2	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.6	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	55		3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		114	50-150
13C2_6:2FTS		127	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA		80	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		80	50-150
13C7_PFUdA		100	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-002
Description: AOPC18-WNB-7-071221			Matrix: Aqueous
Date Sampled: 07/12/2021 1320		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-003
Description: AOPC1-11N21A1-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1520
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	50	07/27/2021 1440	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	180	U	360	180	91	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	180	U	360	180	91	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	180	U	360	180	91	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	260	J	360	180	91	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	180	U	360	180	91	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	180	U	360	180	91	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	180	U	360	180	91	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	180	U	360	180	91	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	180	U	360	180	91	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	520		180	90	45	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	200		180	90	45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	490		180	90	45	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3300		180	90	45	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	190		180	90	45	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	160	J	180	90	45	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	900		180	90	45	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	350		180	90	45	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	340		180	90	45	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	90	U	180	90	45	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	7700		180	90	45	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		96	50-150
13C2_6:2FTS		115	50-150
13C2_8:2FTS		102	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		94	50-150
13C3_PFBS		106	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		103	50-150
13C5_PFPeA		95	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		108	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-003
Description: AOPC1-11N21A1-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1520
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		99	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-004
Description: AOPC8-W11-2-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1610
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/27/2021 1451	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	50		8.4	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	UQ	8.4	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	UQ	8.4	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	UQ	8.4	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.8		4.2	2.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	16		4.2	2.1	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	48		4.2	2.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	7.9		4.2	2.1	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	8.4		4.2	2.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	110		4.2	2.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	7.6		4.2	2.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.0	J	4.2	2.1	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	152	50-150
13C2_6:2FTS		123	50-150
13C2_8:2FTS		66	50-150
13C2_PFDoA		54	50-150
13C2_PFTeDA		54	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		69	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		81	50-150
13C6_PFDA		70	50-150
13C7_PFUdA		64	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-004
Description: AOPC8-W11-2-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1610
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	50-150
13C8_PFOS		60	50-150
13C8_PFOSA		72	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA	N	40	50-150
d3-MeFOSAA	N	47	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-005
Description: AOPC6-WV4-18-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1805
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	10	07/27/2021 1501	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	37	U	74	37	19	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	37	U	74	37	19	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	20	J	74	37	19	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	330		74	37	19	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	37	U	74	37	19	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	37	U	74	37	19	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	37	U	74	37	19	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	37	U	74	37	19	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	37	U	74	37	19	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	490		37	19	9.3	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	91		37	19	9.3	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	350		37	19	9.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1600		37	19	9.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	150		37	19	9.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	130		37	19	9.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	720		37	19	9.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	14	J	37	19	9.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	170		37	19	9.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	320		37	19	9.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	19	U	37	19	9.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3300		37	19	9.3	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		101	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		127	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		98	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		104	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-005
Description: AOPC6-WV4-18-071221			Matrix: Aqueous
Date Sampled: 07/12/2021 1805		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		91	50-150
13C8_PFOSA		102	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-006
Description: FB04-071221
Matrix: Aqueous
Date Sampled: 07/12/2021 1700
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1712	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		100	50-150
13C2_6:2FTS		145	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		93	50-150
13C7_PFUdA		98	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech		Laboratory ID: WG20004-006
Description: FB04-071221		Matrix: Aqueous
Date Sampled: 07/12/2021 1700	Project Name: NASA ARC PFAS	
Date Received: 07/20/2021	Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		116	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-007
Description: AOPC25-15H12A-071321
Matrix: Aqueous
Date Sampled: 07/13/2021 1245
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1722	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	540		8.3	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.7		4.2	2.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	J	4.2	2.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	12		4.2	2.1	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.3	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.0	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.2	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	4.2	2.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.0		4.2	2.1	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		127	50-150
13C2_6:2FTS		135	50-150
13C2_8:2FTS		124	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		94	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		106	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBA		124	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		113	50-150
13C5_PFPeA		113	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		101	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-007
Description: AOPC25-15H12A-071321			Matrix: Aqueous
Date Sampled: 07/13/2021 1245		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		116	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		113	50-150
13C9_PFNA		111	50-150
d5-EtFOSAA		104	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-008
Description: AOPC25-15B10A-071321
Matrix: Aqueous
Date Sampled: 07/13/2021 1315
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1733	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	4.4		3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.6	J	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	8.6		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.8	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.6	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.2	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.3		3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		117	50-150
13C2_6:2FTS		129	50-150
13C2_8:2FTS		118	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		109	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		107	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		119	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		98	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-008
Description: AOPC25-15B10A-071321
Matrix: Aqueous
Date Sampled: 07/13/2021 1315
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	50-150
13C8_PFOS		96	50-150
13C8_PFOSA		104	50-150
13C9_PFNA		100	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-009
Description: AOPC24-64A-071321
Matrix: Aqueous
Date Sampled: 07/13/2021 1605
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1744	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	9.6		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.7		3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.7	J	3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	11		3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.5	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.8		3.8	1.9	0.96	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		118	50-150
13C2_6:2FTS		131	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		113	50-150
13C4_PFBA		107	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		94	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-009
Description: AOPC24-64A-071321			Matrix: Aqueous
Date Sampled: 07/13/2021 1605		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	50-150
13C8_PFOS		91	50-150
13C8_PFOSA		97	50-150
13C9_PFNA		114	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-010
Description: AOPC24-WU4-1-071321
Matrix: Aqueous
Date Sampled: 07/13/2021 1605
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1754	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.9	J	8.8	4.4	2.2	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.4	U	8.8	4.4	2.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.4		4.4	2.2	1.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	6.4		4.4	2.2	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	25		4.4	2.2	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	5.0		4.4	2.2	1.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.6	J	4.4	2.2	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.2		4.4	2.2	1.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.3	J	4.4	2.2	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.9		4.4	2.2	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	8.0		4.4	2.2	1.1	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		105	50-150
13C2_6:2FTS		141	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		102	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		108	50-150
13C4_PFBA		108	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		108	50-150
13C5_PFPeA		107	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		104	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-010
Description: AOPC24-WU4-1-071321			Matrix: Aqueous
Date Sampled: 07/13/2021 1605		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		113	50-150
13C8_PFOS		93	50-150
13C8_PFOSA		124	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		115	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-011
Description: FB-05-071321
Matrix: Aqueous
Date Sampled: 07/13/2021 1615
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1805	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		101	50-150
13C2_6:2FTS	N	153	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		116	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		105	50-150
13C5_PFHxA		103	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		95	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-011
Description: FB-05-071321			Matrix: Aqueous
Date Sampled: 07/13/2021 1615		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		117	50-150
13C8_PFOS		90	50-150
13C8_PFOSA		111	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-012
Description: AOPC5-WU4-19-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1135
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/26/2021 1815	MMM	07/23/2021 1742	99902
2	SOP SPE	PFAS by ID SOP QSM B-15	10	07/27/2021 1512	MMM	07/23/2021 1742	99902

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	620		6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1500		34	17	8.6	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	170		3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.7	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1200		34	17	8.6	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4400		34	17	8.6	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	260		3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	4.2		3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	230		3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1300		34	17	8.6	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	7.6		3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	330		3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	370		3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3300		34	17	8.6	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		144	50-150		98	50-150
13C2_6:2FTS		116	50-150		105	50-150
13C2_8:2FTS		112	50-150		106	50-150
13C2_PFDoA		81	50-150		98	50-150
13C2_PFTeDA		73	50-150		93	50-150
13C3_PFBS		86	50-150		96	50-150
13C3_PFHxS		68	50-150		90	50-150
13C3-HFPO-DA		95	50-150		97	50-150
13C4_PFBA		108	50-150		103	50-150
13C4_PFHpA		83	50-150		95	50-150
13C5_PFHxA		96	50-150		98	50-150
13C5_PFPeA		100	50-150		88	50-150
13C6_PFDA		102	50-150		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-012
Description: AOPC5-WU4-19-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1135
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		93	50-150		100	50-150
13C8_PFOA		101	50-150		92	50-150
13C8_PFOS		79	50-150		91	50-150
13C8_PFOSA		105	50-150		104	50-150
13C9_PFNA		85	50-150		95	50-150
d5-EtFOSAA		97	50-150		90	50-150
d3-MeFOSAA		96	50-150		104	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-013
Description: AOPC5-14039A-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2052	MMM	07/27/2021 1332	10113
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/03/2021 1036	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	27		7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	480		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	310		3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	UQ	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	720	Q	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	50	Q	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	23		3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	330		3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4700	EQ	3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	270		3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.7	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	130		3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1400	E	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	8.7	Q	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	250		3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	560		3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	68000	BEQ	3.9	2.0	0.97	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	248	50-150		107	50-150
13C2_6:2FTS		148	50-150		109	50-150
13C2_8:2FTS		108	50-150		117	50-150
13C2_PFDoA		71	50-150		101	50-150
13C2_PFTeDA		76	50-150		109	50-150
13C3_PFBS		81	50-150		117	50-150
13C3_PFHxS	N	49	50-150		104	50-150
13C3-HFPO-DA		63	50-150		108	50-150
13C4_PFBA		64	50-150		113	50-150
13C4_PFHpA		68	50-150		112	50-150
13C5_PFHxA		77	50-150		100	50-150
13C5_PFPeA		71	50-150		100	50-150
13C6_PFDA		89	50-150		100	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-013
Description: AOPC5-14039A-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	50-150		116	50-150
13C8_PFOA		81	50-150		110	50-150
13C8_PFOS	N	24	50-150		107	50-150
13C8_PFOSA		78	50-150		124	50-150
13C9_PFNA	N	28	50-150		105	50-150
d5-EtFOSAA		77	50-150		112	50-150
d3-MeFOSAA		92	50-150		111	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-013
Description: AOPC5-14039A-071421 | Matrix: Aqueous
Date Sampled: 07/14/2021 1620 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2052	MMM	07/27/2021 1332	10113
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/03/2021 1036	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	390	U	770	390	190	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	390	U	770	390	190	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	390	U	770	390	190	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	390	U	770	390	190	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	390	U	770	390	190	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	390	U	770	390	190	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	390	U	770	390	190	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	390	U	770	390	190	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	390	U	770	390	190	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	260	J	390	200	97	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	380	J	390	200	97	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	300	J	390	200	97	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3900		390	200	97	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	160	J	390	200	97	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	100	J	390	200	97	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1600		390	200	97	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	220	J	390	200	97	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	500		390	200	97	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	200	U	390	200	97	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	40000	B	390	200	97	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	248	50-150		107	50-150
13C2_6:2FTS		148	50-150		109	50-150
13C2_8:2FTS		108	50-150		117	50-150
13C2_PFDoA		71	50-150		101	50-150
13C2_PFTeDA		76	50-150		109	50-150
13C3_PFBS		81	50-150		117	50-150
13C3_PFHxS	N	49	50-150		104	50-150
13C3-HFPO-DA		63	50-150		108	50-150
13C4_PFBA		64	50-150		113	50-150
13C4_PFHpA		68	50-150		112	50-150
13C5_PFHxA		77	50-150		100	50-150
13C5_PFPeA		71	50-150		100	50-150
13C6_PFDA		89	50-150		100	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-013
Description: AOPC5-14039A-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	50-150		116	50-150
13C8_PFOA		81	50-150		110	50-150
13C8_PFOS	N	24	50-150		107	50-150
13C8_PFOSA		78	50-150		124	50-150
13C9_PFNA	N	28	50-150		105	50-150
d5-EtFOSAA		77	50-150		112	50-150
d3-MeFOSAA		92	50-150		111	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-014
Description: AOPC3-W7-9-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 0027	MMM	07/27/2021 1332	10113
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1436	SES	08/02/2021 1842	10799

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	14	Q	8.4	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	UQ	8.4	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.4	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	14		4.2	2.1	1.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	4.9		4.2	2.1	1.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	19		4.2	2.1	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	180		4.2	2.1	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	45		4.2	2.1	1.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	5.5		4.2	2.1	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	51		4.2	2.1	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	54		4.2	2.1	1.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	11		4.2	2.1	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	62		4.2	2.1	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	56		4.2	2.1	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	160	B	4.2	2.1	1.1	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	277	50-150	N	186	50-150
13C2_6:2FTS	N	203	50-150		142	50-150
13C2_8:2FTS		125	50-150		93	50-150
13C2_PFDoA		55	50-150		68	50-150
13C2_PFTeDA		56	50-150		69	50-150
13C3_PFBS		70	50-150		72	50-150
13C3_PFHxS		73	50-150		71	50-150
13C3-HFPO-DA		75	50-150		83	50-150
13C4_PFBA		56	50-150		67	50-150
13C4_PFHpA		84	50-150		88	50-150
13C5_PFHxA		68	50-150		76	50-150
13C5_PFPeA		69	50-150		74	50-150
13C6_PFDA		88	50-150		83	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-014
Description: AOPC3-W7-9-071421			Matrix: Aqueous
Date Sampled: 07/14/2021 1620	Project Name: NASA ARC PFAS		
Date Received: 07/20/2021	Project Number: 103IG667601		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	50-150		81	50-150
13C8_PFOA		87	50-150		88	50-150
13C8_PFOS		70	50-150		72	50-150
13C8_PFOSA		84	50-150		75	50-150
13C9_PFNA		84	50-150		81	50-150
d5-EtFOSAA		80	50-150		78	50-150
d3-MeFOSAA		88	50-150		80	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-014
Description: AOPC3-W7-9-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 0027	MMM	07/27/2021 1332	10113
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1436	SES	08/02/2021 1842	10799

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	11		8.3	4.2	2.1	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	UQ	8.3	4.2	2.1	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	14		4.2	2.1	1.0	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	4.4		4.2	2.1	1.0	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	18		4.2	2.1	1.0	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	180		4.2	2.1	1.0	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	48		4.2	2.1	1.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	5.8		4.2	2.1	1.0	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	52		4.2	2.1	1.0	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	53		4.2	2.1	1.0	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	11		4.2	2.1	1.0	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	67		4.2	2.1	1.0	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	51		4.2	2.1	1.0	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.2	2.1	1.0	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	150		4.2	2.1	1.0	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	277	50-150	N	186	50-150
13C2_6:2FTS	N	203	50-150		142	50-150
13C2_8:2FTS		125	50-150		93	50-150
13C2_PFDoA		55	50-150		68	50-150
13C2_PFTeDA		56	50-150		69	50-150
13C3_PFBS		70	50-150		72	50-150
13C3_PFHxS		73	50-150		71	50-150
13C3-HFPO-DA		75	50-150		83	50-150
13C4_PFBA		56	50-150		67	50-150
13C4_PFHpA		84	50-150		88	50-150
13C5_PFHxA		68	50-150		76	50-150
13C5_PFPeA		69	50-150		74	50-150
13C6_PFDA		88	50-150		83	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-014
Description: AOPC3-W7-9-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	50-150		81	50-150
13C8_PFOA		87	50-150		88	50-150
13C8_PFOS		70	50-150		72	50-150
13C8_PFOSA		84	50-150		75	50-150
13C9_PFNA		84	50-150		81	50-150
d5-EtFOSAA		80	50-150		78	50-150
d3-MeFOSAA		88	50-150		80	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-015
Description: AOPC5-WNB-14-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1820
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 0037	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	18		7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	130		7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	29		3.8	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	7.2		3.8	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	25		3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	220		3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	150		3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	8.7		3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.3	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190		3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	550		3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	27		3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	120		3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	540		3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.2	J	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	410	B	3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		107	50-150
13C2_6:2FTS		112	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		62	50-150
13C2_PFTeDA		64	50-150
13C3_PFBS		69	50-150
13C3_PFHxS		62	50-150
13C3-HFPO-DA		81	50-150
13C4_PFBA		61	50-150
13C4_PFHpA		75	50-150
13C5_PFHxA		67	50-150
13C5_PFPeA		70	50-150
13C6_PFDA		70	50-150
13C7_PFUdA		69	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-015
Description: AOPC5-WNB-14-071421			Matrix: Aqueous
Date Sampled: 07/14/2021 1820		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	50-150
13C8_PFOS		68	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		73	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		78	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-016
Description: FB-06-071421
Matrix: Aqueous
Date Sampled: 07/14/2021 1830
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 0048	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.9	B	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		80	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		79	50-150
13C2_PFDoA		62	50-150
13C2_PFTeDA		59	50-150
13C3_PFBS		66	50-150
13C3_PFHxS		68	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		71	50-150
13C4_PFHpA		62	50-150
13C5_PFHxA		71	50-150
13C5_PFPeA		65	50-150
13C6_PFDA		61	50-150
13C7_PFUdA		64	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-016
Description: FB-06-071421			Matrix: Aqueous
Date Sampled: 07/14/2021 1830		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	50-150
13C8_PFOS		61	50-150
13C8_PFOSA		70	50-150
13C9_PFNA		69	50-150
d5-EtFOSAA		72	50-150
d3-MeFOSAA		72	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-017
Description: AOPC1,7-WU4-9-071521
Matrix: Aqueous
Date Sampled: 07/15/2021 1230
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2134	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	91		7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.1		3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	7.8		3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	34		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.2		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.1	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	6.0		3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	5.1		3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.7		3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	18	B	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	50-150
13C2_6:2FTS		95	50-150
13C2_8:2FTS		68	50-150
13C2_PFDoA		68	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		81	50-150
13C4_PFBA		80	50-150
13C4_PFHpA		68	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		73	50-150
13C7_PFUdA		67	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-017
Description: AOPC1,7-WU4-9-071521			Matrix: Aqueous
Date Sampled: 07/15/2021 1230		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	50-150
13C8_PFOS		75	50-150
13C8_PFOSA		73	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-018
Description: AOPC1,7-PZA1-5C-071521
Matrix: Aqueous
Date Sampled: 07/15/2021 1500
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 2145	MMM	07/27/2021 1332	10113

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	US	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	21	S	3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.4	J	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	US	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	27		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	250	S	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	13		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	7.4		3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	22		3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	US	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	38		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	17		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	110	B	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		85	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		69	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		78	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		72	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-018
Description: AOPC1,7-PZA1-5C-071521			Matrix: Aqueous
Date Sampled: 07/15/2021 1500		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	50-150
13C8_PFOS		70	50-150
13C8_PFOSA		76	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		80	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-019
Description: FB-07-071521
Matrix: Aqueous
Date Sampled: 07/15/2021 1540
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1550	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	12		7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	UL	4.0	2.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		93	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		86	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		85	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-019
Description: FB-07-071521			Matrix: Aqueous
Date Sampled: 07/15/2021 1540		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG20004-020
Description: AOPC5-14D12A-071621 | Matrix: Aqueous
Date Sampled: 07/16/2021 1200 | Project Name: NASA ARC PFAS
Date Received: 07/20/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1601	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1700	JJG	07/30/2021 1838	10648

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.2	J	7.4	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	11		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.1		3.5	1.8	0.87	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	24		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.2		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	3.0	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.7		3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	6.6		3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	8.3		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	8.3		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	14		3.7	1.9	0.92	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		93	50-150		92	50-150
13C2_6:2FTS		91	50-150		94	50-150
13C2_8:2FTS		78	50-150		92	50-150
13C2_PFDoA		81	50-150		73	50-150
13C2_PFTeDA		84	50-150		77	50-150
13C3_PFBS		85	50-150		80	50-150
13C3_PFHxS		85	50-150		79	50-150
13C3-HFPO-DA		88	50-150		90	50-150
13C4_PFBA		105	50-150		92	50-150
13C4_PFHpA		89	50-150		86	50-150
13C5_PFHxA		79	50-150		81	50-150
13C5_PFPeA		92	50-150		83	50-150
13C6_PFDA		84	50-150		74	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-020
Description: AOPC5-14D12A-071621
Matrix: Aqueous
Date Sampled: 07/16/2021 1200
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		83	50-150		77	50-150
13C8_PFOA		96	50-150		94	50-150
13C8_PFOS		81	50-150		77	50-150
13C8_PFOSA		88	50-150		90	50-150
13C9_PFNA		90	50-150		84	50-150
d5-EtFOSAA		87	50-150		77	50-150
d3-MeFOSAA		89	50-150		86	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-021
Description: AOPC5-14D12A-071621-FD
Matrix: Aqueous
Date Sampled: 07/16/2021 1200
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1611	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1711	JJG	07/30/2021 1838	10648

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.6	J	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	12		3.8	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.3		3.5	1.8	0.89	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	25		3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.7		3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.5	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.6		3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	7.5		3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	8.3		3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	8.6		3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	16		3.8	1.9	0.94	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		99	50-150		100	50-150
13C2_6:2FTS		115	50-150		104	50-150
13C2_8:2FTS		89	50-150		101	50-150
13C2_PFDoA		90	50-150		72	50-150
13C2_PFTeDA		79	50-150		75	50-150
13C3_PFBS		80	50-150		82	50-150
13C3_PFHxS		84	50-150		77	50-150
13C3-HFPO-DA		88	50-150		91	50-150
13C4_PFBA		100	50-150		93	50-150
13C4_PFHpA		91	50-150		90	50-150
13C5_PFHxA		82	50-150		81	50-150
13C5_PFPeA		89	50-150		89	50-150
13C6_PFDA		83	50-150		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-021
Description: AOPC5-14D12A-071621-FD
Matrix: Aqueous
Date Sampled: 07/16/2021 1200
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		88	50-150		69	50-150
13C8_PFOA		100	50-150		95	50-150
13C8_PFOS		77	50-150		82	50-150
13C8_PFOSA		85	50-150		89	50-150
13C9_PFNA		87	50-150		79	50-150
d5-EtFOSAA		91	50-150		87	50-150
d3-MeFOSAA		91	50-150		85	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-022
Description: AOPC3-W19-2-071621
Matrix: Aqueous
Date Sampled: 07/16/2021 1355
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1622	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.0	J	6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	UL	3.4	1.7	0.85	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	8.1		3.4	1.7	0.85	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.4	J	3.4	1.7	0.85	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.1	J	3.4	1.7	0.85	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.1		3.4	1.7	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.3	J	3.4	1.7	0.85	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		94	50-150
13C2_6:2FTS		97	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		78	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-022
Description: AOPC3-W19-2-071621			Matrix: Aqueous
Date Sampled: 07/16/2021 1355		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-023
Description: AOPC3-W7-10-071621
Matrix: Aqueous
Date Sampled: 07/16/2021 1520
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1633	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	12		6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.87	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	UL	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	10		3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.4	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.0	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.6		3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	57		3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		108	50-150
13C2_6:2FTS		113	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		75	50-150
13C3_PFHxS		76	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		73	50-150
13C7_PFUdA		76	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-023
Description: AOPC3-W7-10-071621			Matrix: Aqueous
Date Sampled: 07/16/2021 1520		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		84	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		73	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-024
Description: AOPC24-171A-071621
Matrix: Aqueous
Date Sampled: 07/16/2021 1630
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1643	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.2		3.8	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	JL	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	7.0		3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.4		3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	US	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.5	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	US	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.7	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	US	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.2		3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		93	50-150
13C2_6:2FTS		97	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		90	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		78	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-024
Description: AOPC24-171A-071621			Matrix: Aqueous
Date Sampled: 07/16/2021 1630		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-025
Description: FB-08-071621
Matrix: Aqueous
Date Sampled: 07/16/2021 1610
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1704	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	UL	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		82	50-150
13C2_6:2FTS		88	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		78	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-025
Description: FB-08-071621			Matrix: Aqueous
Date Sampled: 07/16/2021 1610		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG20004-026
Description: FB-07-071621
Matrix: Aqueous
Date Sampled: 07/15/2021 1600
Project Name: NASA ARC PFAS
Date Received: 07/20/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1715	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	UL	3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	UQ	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	50-150
13C2_6:2FTS		122	50-150
13C2_8:2FTS		72	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA	N	45	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		75	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG20004-026
Description: FB-07-071621			Matrix: Aqueous
Date Sampled: 07/15/2021 1600		Project Name: NASA ARC PFAS	
Date Received: 07/20/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		107	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

APPENDIX C

SUPPORT DOCUMENTATION

APPENDIX C

SUPPORT DOCUMENTATION

NASA-AMES
SDG WG20004

SAMPLE IDENTIFICATION	AOPC5-14039A-071421
COMPOUND	PERFLUOROOCTANESULFONIC ACID (PFOS)
COMPOUND AREA	2903671
INTERNAL STANDARD AMOUNT (ng/L)	1100
DILUTION FACTOR (100X but incorp. in result)	1
INTERNAL STANDARD AREA	276265
AVERAGE RRF	1.106266
SAMPLE VOLUME (ml)	259
VOLUME EXTRACT (ml)	1
ml to L	1000.00
CONCENTRATION =	40351.1 ng/L
REPORTED CONCENTRATION	40000 ng/L

2903671 x 1100 ng/L x 1ml/(276265 x1.106266 x 259ml)

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\organics\LL\LCMSMS01.i\080321-DOD.b\080321013.d		
Injection Date:	03-Aug-2021 10:36:37	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	1
Lab Sample ID:	WG20004-013	Lab Prep. Batch:	10113
Client ID:	AOPC5-14039A-071421	Sample Group:	WG20004
Sample Info:	WG20004-013,100	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Final Conc.:	Amt * DF * CF	Matrix/Level:	Aqueous

Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0386100

Name	Value	Units	Description
DF	100		Dilution Factor
VF	10000	ul	Final Volume
VI	259	ml	Initial Sample Volume
AlsDf	1		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.715	0	1332695	20	>100:1			1100.00	1526.29	112.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													J
212.9 > 168.9	46	1.715	1.715	0/0	50766	9	1.4:1			40.517	156.44		M
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.079	2.079	0	1266996	16	>100:1			1100.00	1413.98	100.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.079	2.079	0/0	148690	13	>100:1			129.90	501.54		M
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.131	0	363910	16	>100:1			1100.00	1301.99	116.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													J
298.9 > 80	44	2.131	2.131	0/0	31089	15	>100:1	Target = 3.78		68.545	264.65		
298.9 > 99	44	2.120	2.131		9083	16	37:1	3.42 (1.89-5.67)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													J
349 > 80	44	2.476	2.485	0/0	25050	15	94:1	Target = 3.44		77.075	297.59		M
349 > 99	44	2.476	2.485		7186	14	63:1	3.48 (1.72-5.16)					M
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.416	-1	394675	17	>100:1			5500.00	10676	106.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.450	0	1078091	18	>100:1			1100.00	1357.81	100.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.459	0/0	379922	15	>100:1	Target = 17.50		405.19	1564.44		M
313 > 119	49	2.450	2.459		20946	18	>100:1	18.13 (8.75-26.25)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.572	0	760394	19	>100:1			5500.00	4224.16	108.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.579		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.829	2.838	0	1203498	19	>100:1			1100.00	1481.57	111.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													J
363 > 319	47	2.829	2.838	0/0	28626	13	44:1	Target = 3.42		25.934	100.13		M
363 > 169	47	2.829	2.838		9204	14	31:1	3.11 (1.71-5.13)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.837	2.846	0	318682	19	>100:1			1100.00	1258.64	103.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.846	0/0	310937	26	>100:1	Target = 3.68	0.15	1001.59	3867.14		
399 > 99	45	2.846	2.846		90852	24	>100:1	3.42 (1.84-5.52)	0.08				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.873		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													J
449 > 80	45	3.221	3.221	1/1	27884	19	>100:1	Target = 3.55		98.157	378.99		
449 > 99	45	3.221	3.221		7757	21	31:1	3.59 (1.78-5.34)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.183	3.195	0	323809	22	>100:1			5500.00	9512.89	108.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.202		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.221	0	1120725	22	>100:1			1100.00	1390.86	109.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													J
413 > 369	53	3.215	3.214	1/1	56896	28	23:1	Target = 2.93	0.10	56.075	216.51		M
413 > 169	53	3.215	3.214		23512	33	43:1	2.41 (1.46-4.40)	0.26				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.577	3.584	0	276265	21	>100:1			1100.00	1296.72	106.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.584	3.584	1/1	2903671	41	>100:1	Target = 4.05	0.39	10451	40351		M
499 > 99	54	3.577	3.584		743165	36	>100:1	3.90 (2.02-6.07)	0.16				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.788		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.914		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.213		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.379		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.584	3.591	0	1071754	20	>100:1			1100.00	1249.35	105.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.591		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.862	3.861	1	609535	18	>100:1			1100.00	1416.36	123.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.869		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.922	3.929	0	334974	17	>100:1			5500.00	11636	117	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.929		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.929	3.937	0	989342	18	>100:1			1100.00	1339.21	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.929		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.082	4.090	0	1442292	17	>100:1			5500.00	7439.90	110.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.090		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.232	4.241	0	1306569	17	>100:1			5500.00	7443.52	111.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.251		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.232	4.241	0	948286	17	>100:1			1100.00	1351.80	115.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.241		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.502	4.510	0	911707	18	>100:1			1100.00	1223.56	101.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.510		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.748		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.960	4.968	0	1066809	16	>100:1			1100.00	1392.02	109.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.968		ND								
*** 37 13C2_PFDA**													
515 > 470		3.929	3.929	1	847527	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.450	0	961039	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.214	0	1071619	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.715	1.715	0	1153367	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.577	3.584	0	244375	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

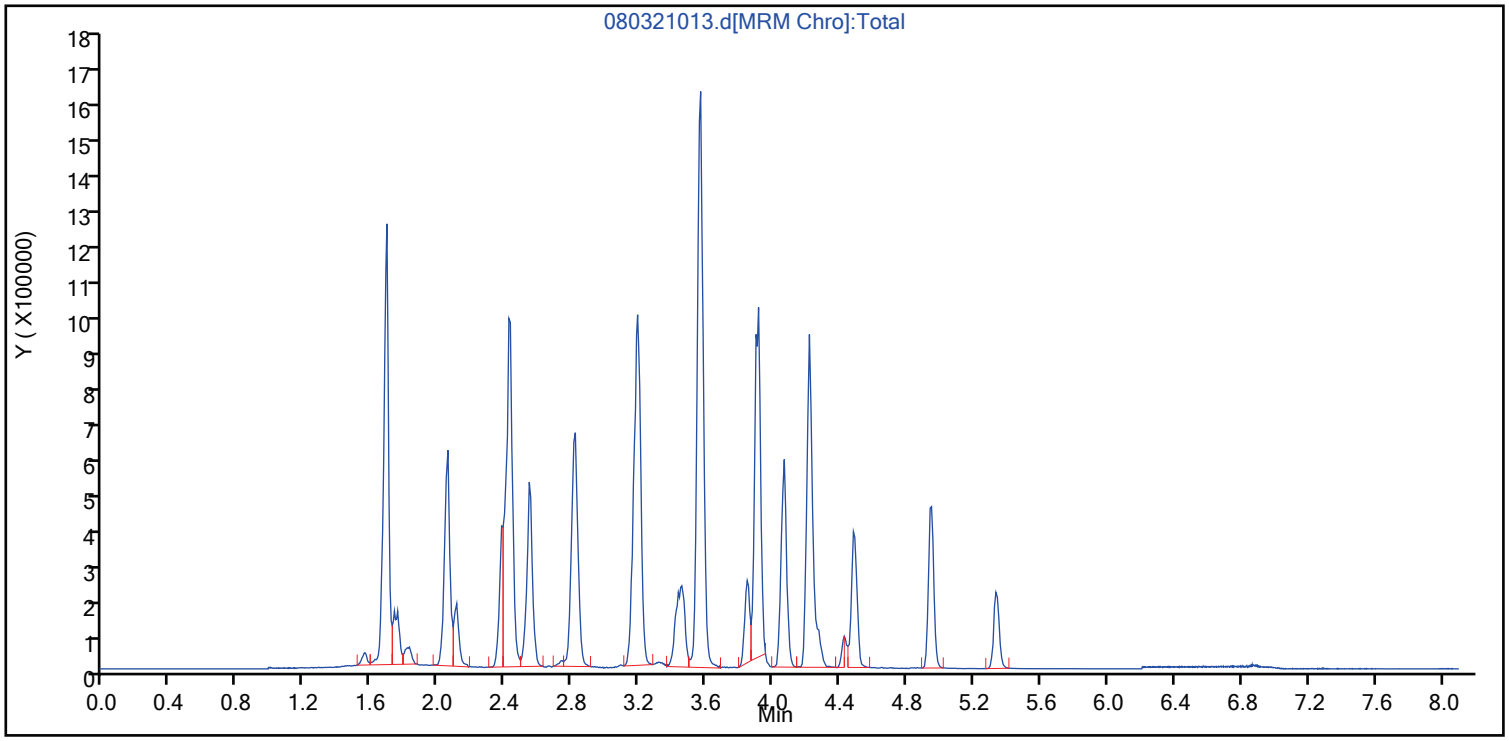
QC Flag Legend

U - Result Less Than Method Detection Limit
J - Compound Concentration Below Quantitation Limit
M - Compound Hit/Peak Manually Integrated

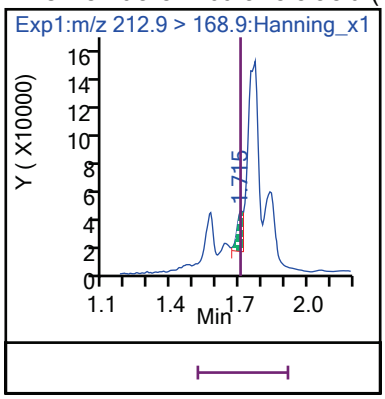
Report Date: 04-Aug-2021 18:08:50 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

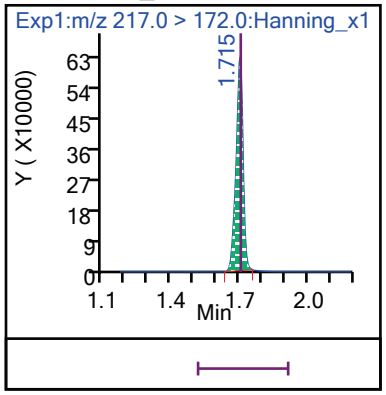
Data File:	\\organics\LL\LCMSMS01.i\080321-DOD.b\080321013.d		
Injection Date:	03-Aug-2021 10:36:37	Inst. ID:	LCMSMS01.i
Client ID:	AOPC5-14039A-071421	Lab ID:	WG20004-013
Sample Info:	WG20004-013,100		
Dil. Factor:	100	Operator:	Matthew M. Miller



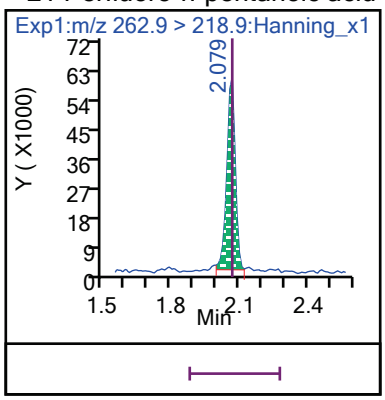
8 Perfluoro-n-butanoic acid (PFBA) (M)



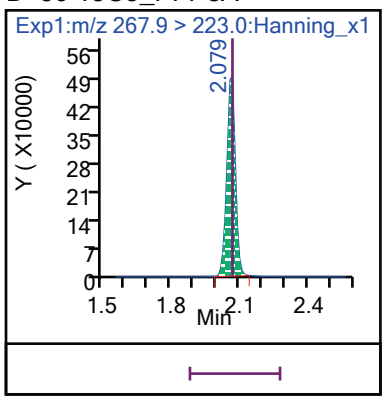
D 46 13C4_PFBA



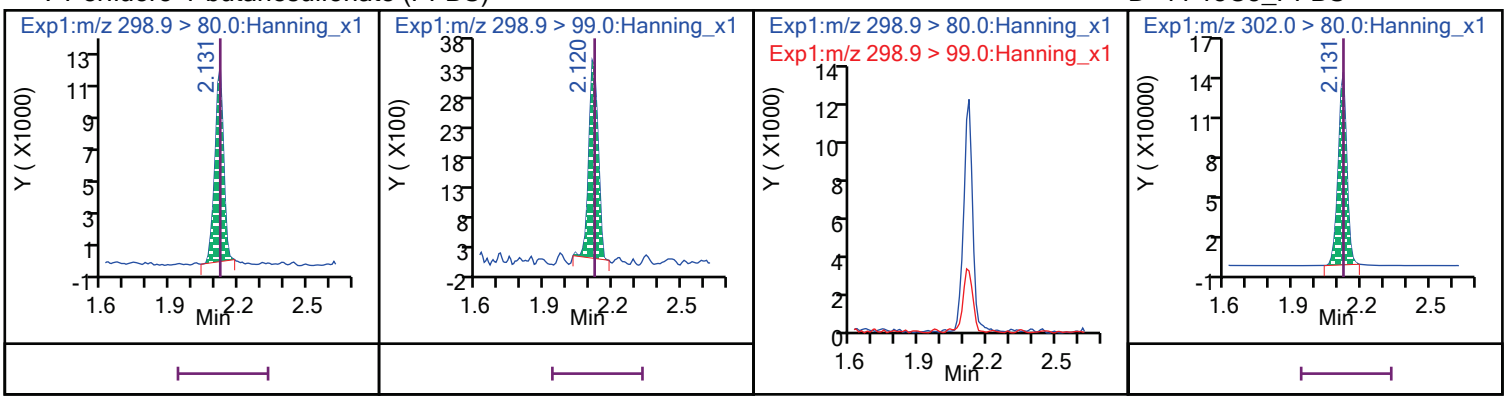
21 Perfluoro-n-pentanoic acid (PFPeA) (M)



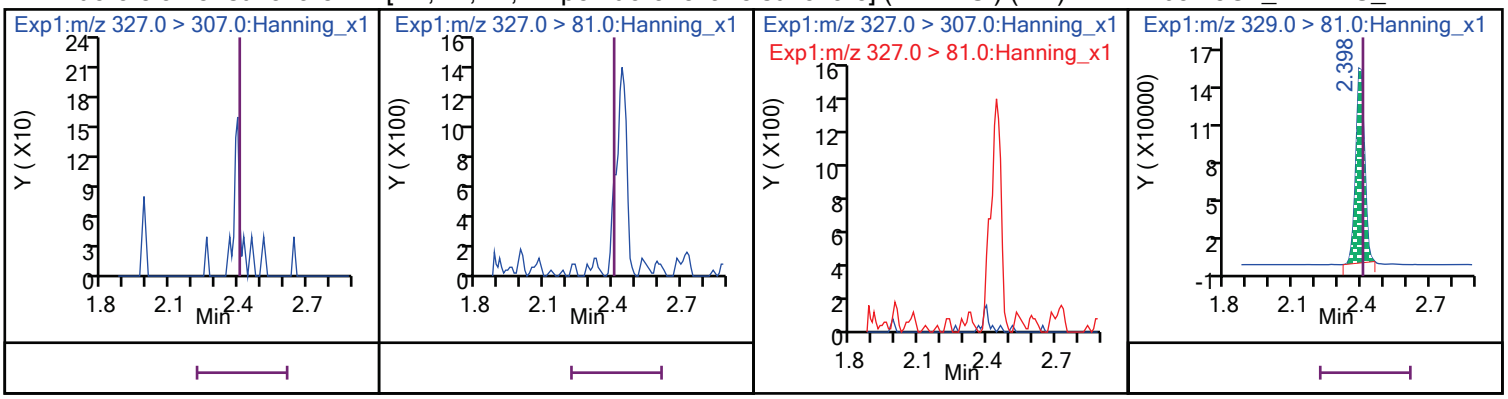
D 50 13C5_PFPeA



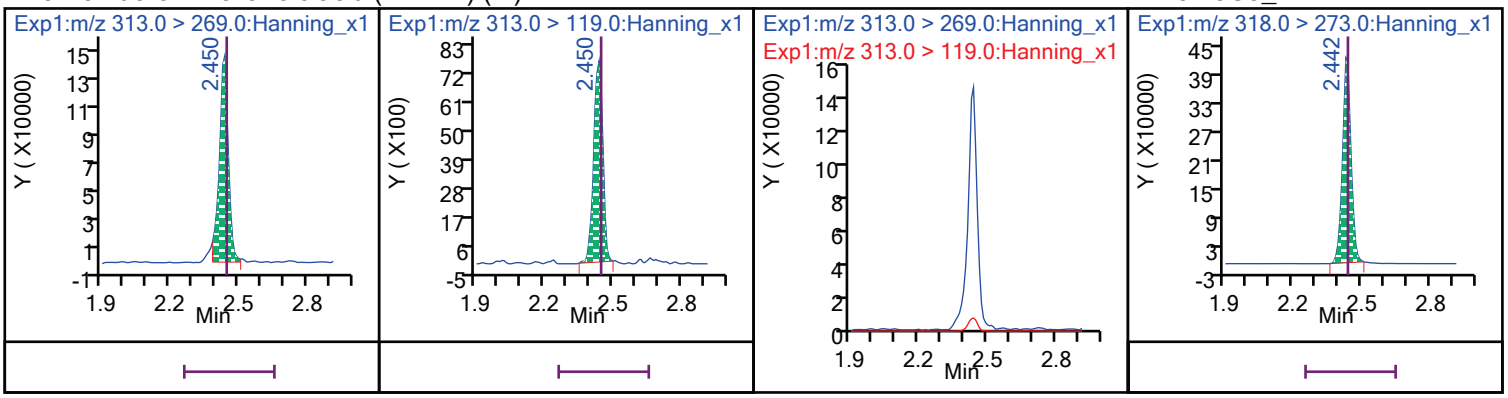
7 Perfluoro-1-butanesulfonate (PFBS) D 44 13C3_PFBS



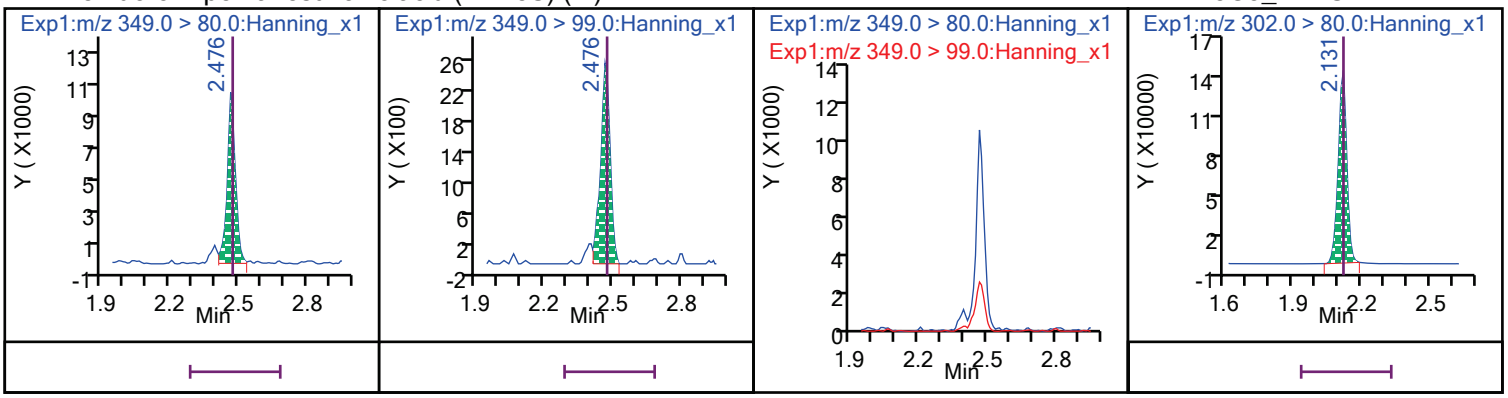
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) (ND) D 63 13C2_4:2 FTS_2



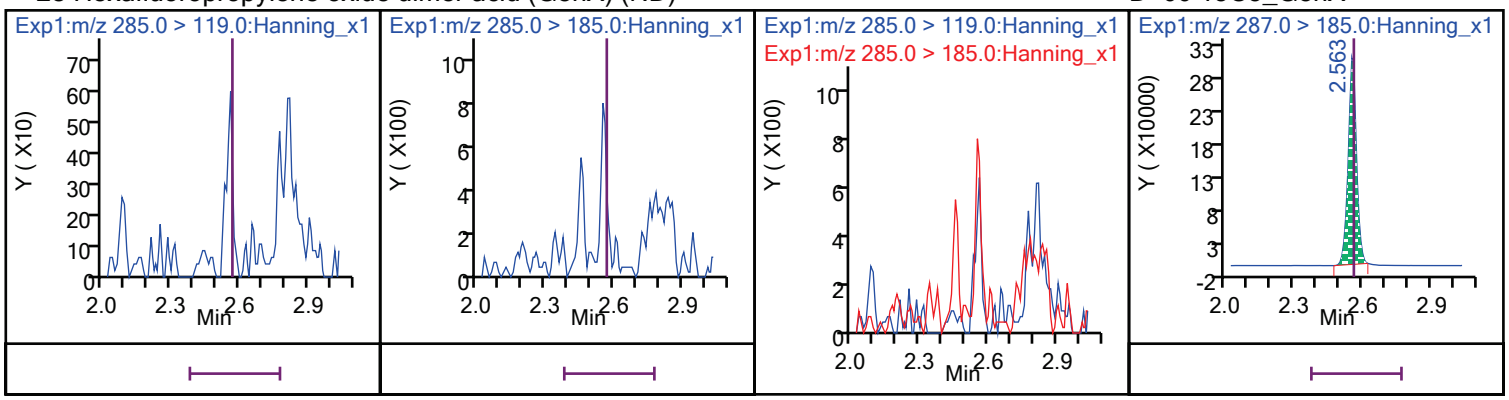
15 Perfluoro-n-hexanoic acid (PFHxA) (M) D 49 13C5_PFHxA



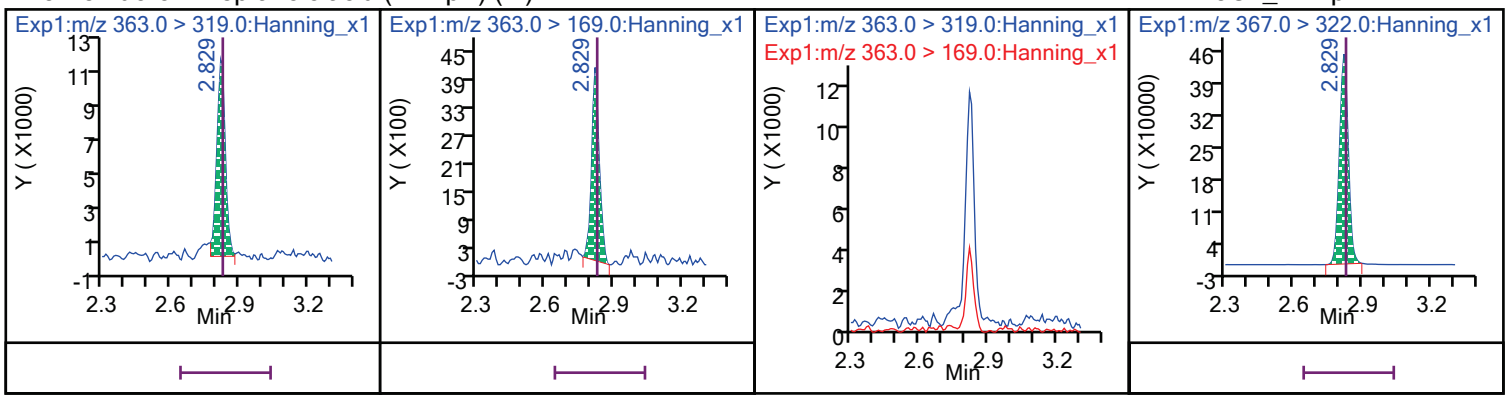
22 Perfluoro-1-pentanesulfonic acid (PFPeS) (M) D 44 13C3_PFBS



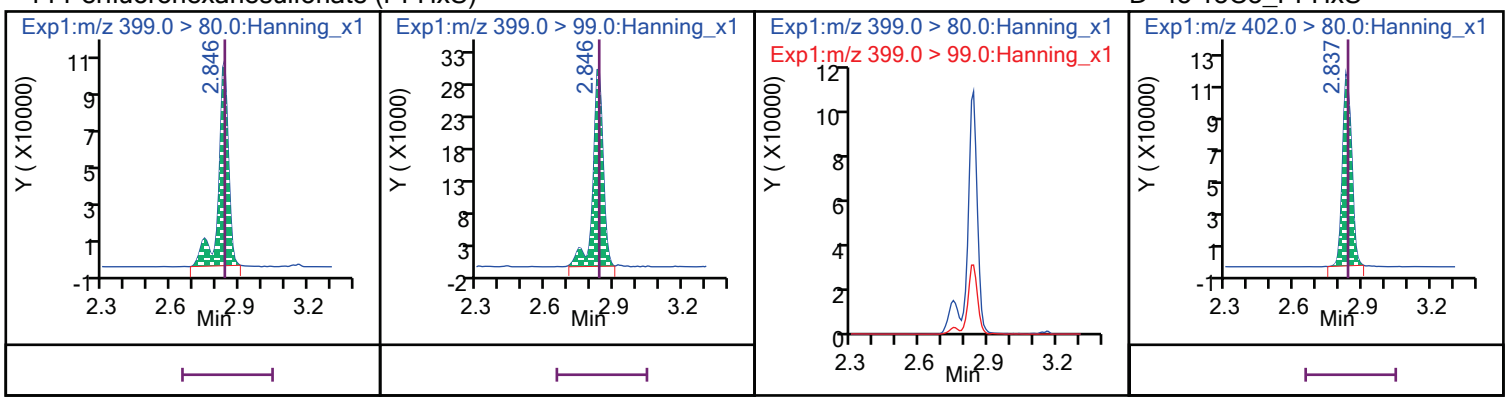
28 Hexafluoropropylene oxide dimer acid (GenX) (ND) D 66 13C3_GenX



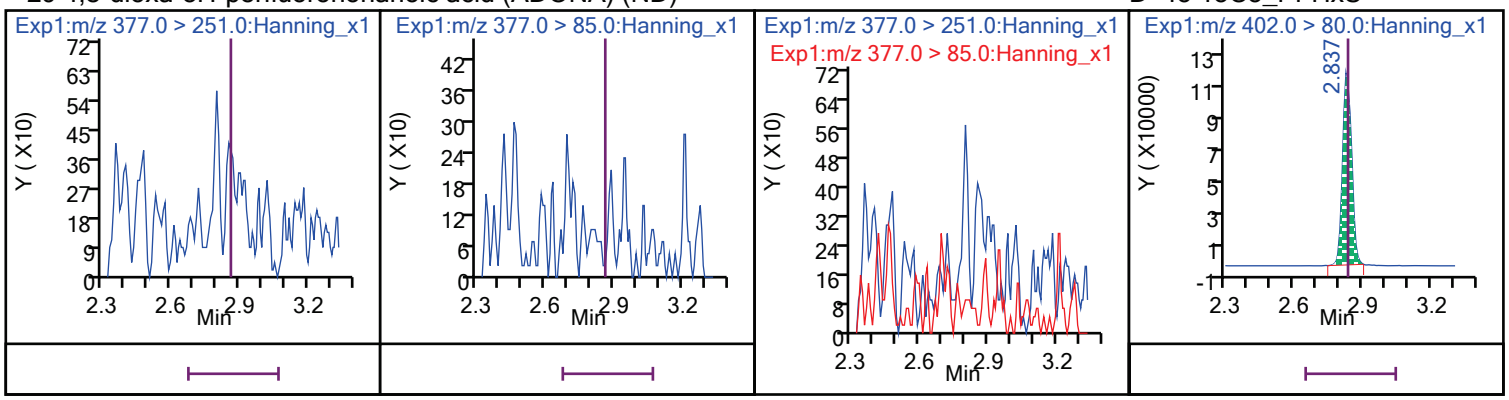
13 Perfluoro-n-heptanoic acid (PFHpA) (M) D 47 13C4_PFHpA



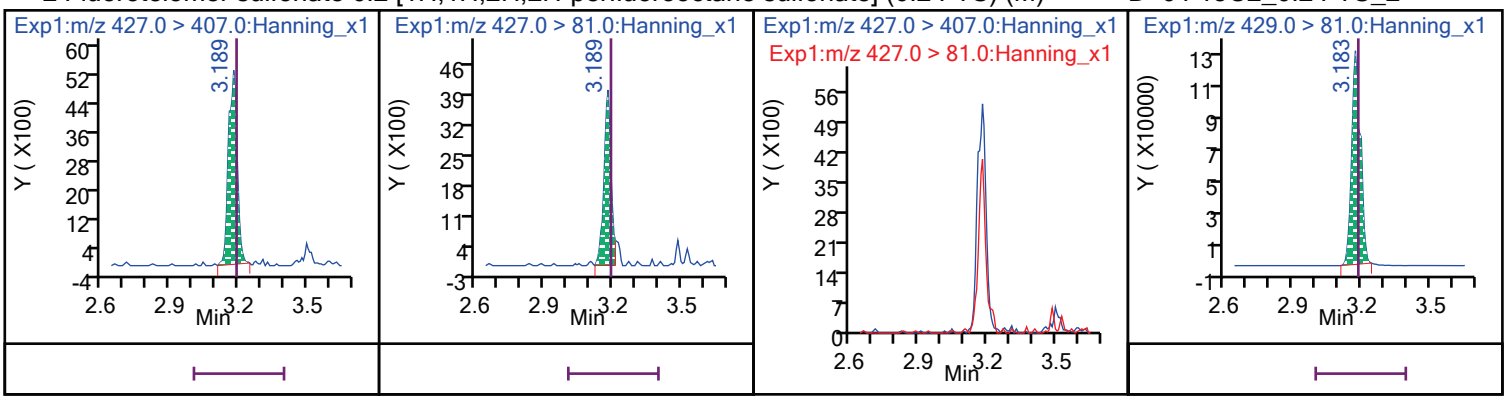
14 Perfluorohexanesulfonate (PFHxS) D 45 13C3_PFHxS



29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) (ND) D 45 13C3_PFHxS

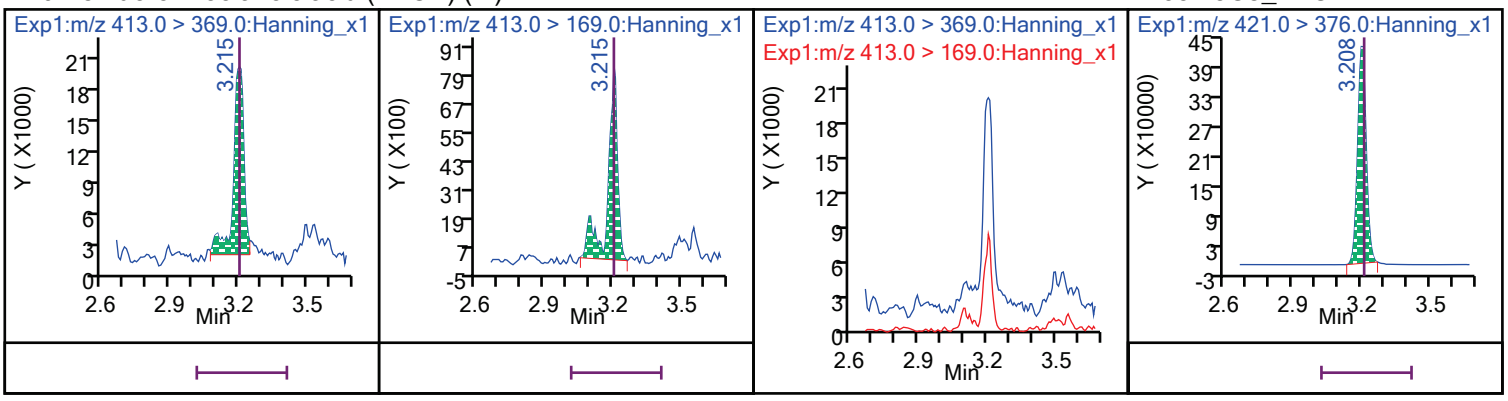


2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) (M)



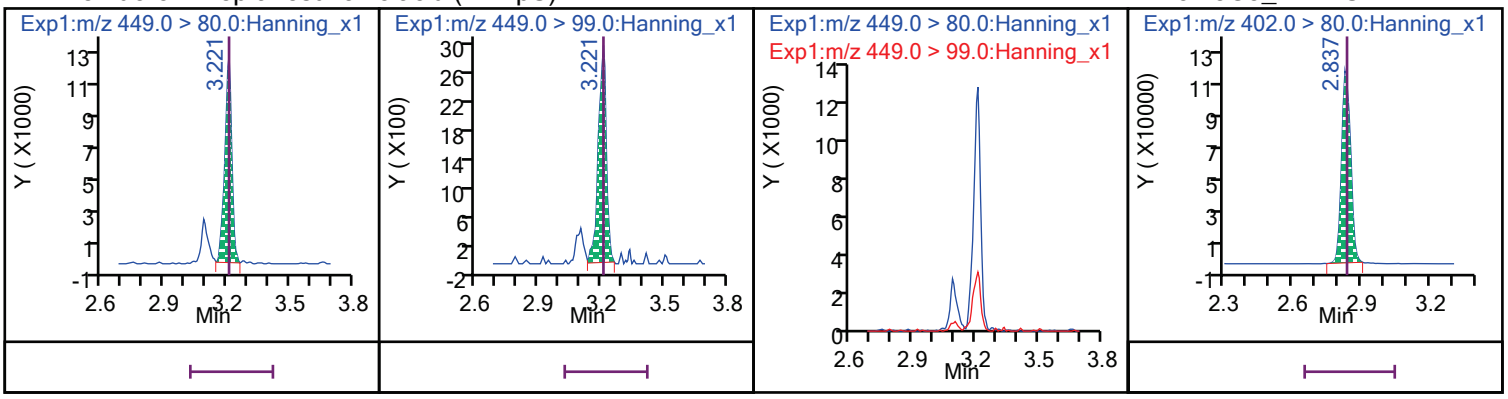
D 64 13C2_6:2 FTS_2

20 Perfluoro-n-octanoic acid (PFOA) (M)



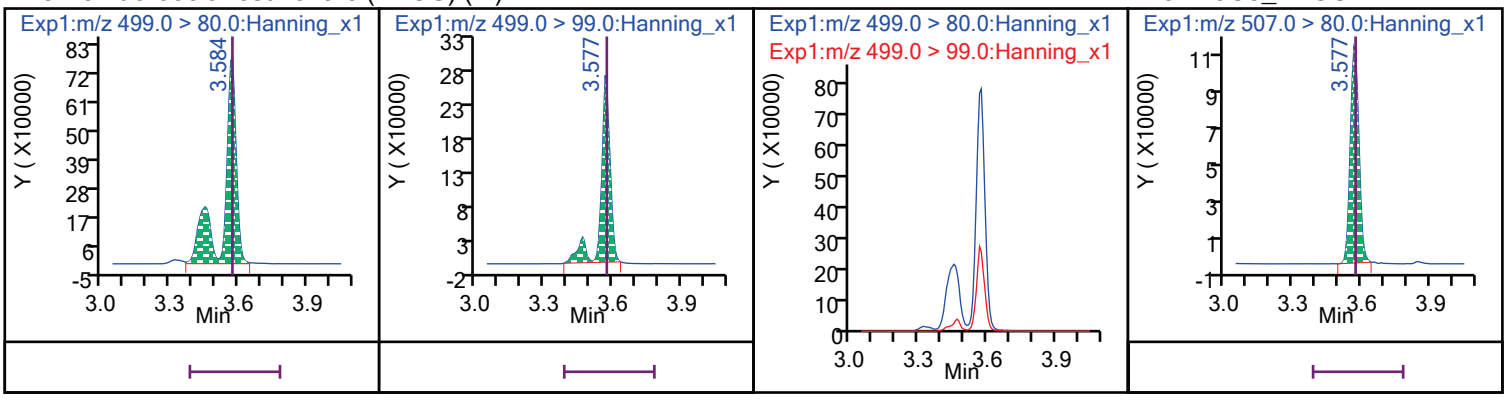
D 53 13C8_PFOA

12 Perfluoro-1-heptanesulfonic acid (PFHpS)



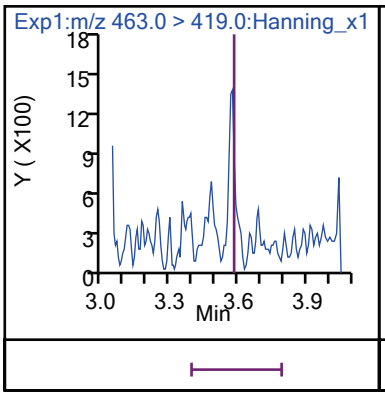
D 45 13C3_PFHxS

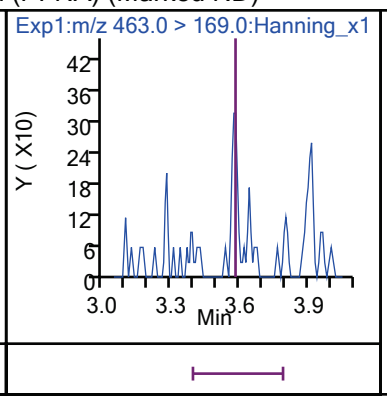
18 Perfluorooctanesulfonate (PFOS) (M)

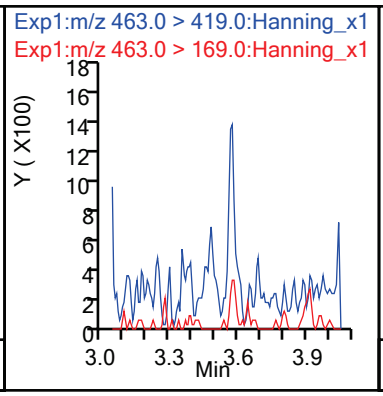


D 54 13C8_PFOS

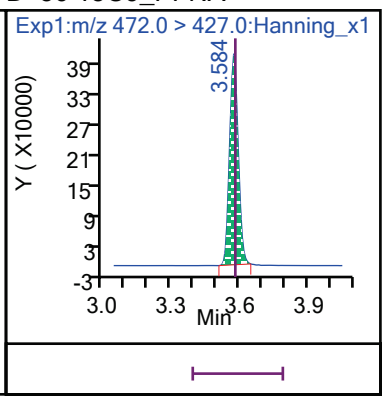
17 Perfluoro-n-nonanoic acid (PFNA) (Marked ND)



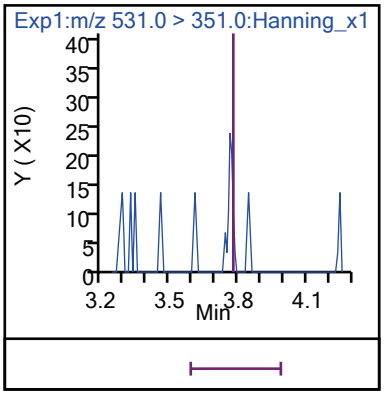




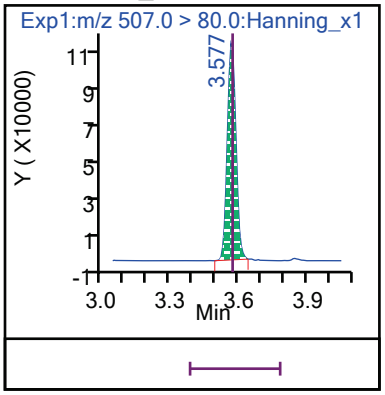
D 56 13C9_PFNA



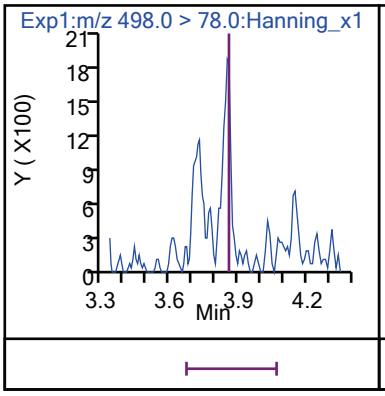
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) (Marked ND)

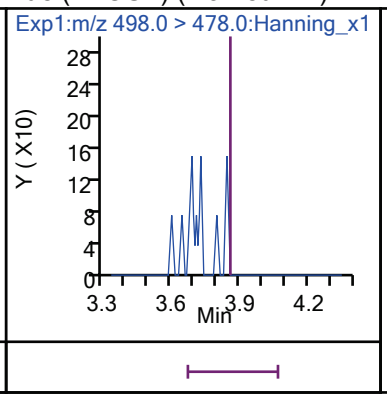


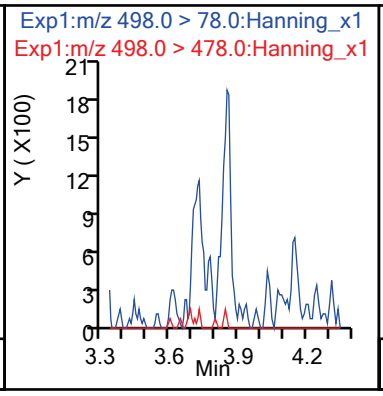
D 54 13C8_PFOS



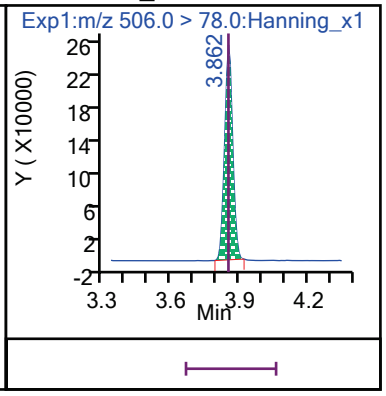
19 Perfluoro-1-octanesulfonamide (PFOSA) (Marked ND)



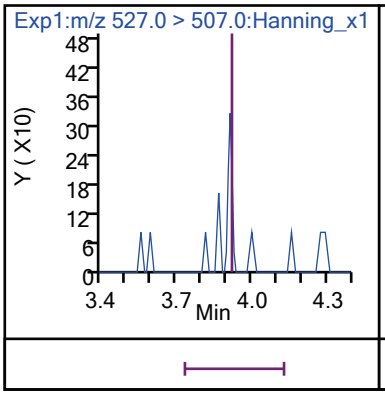


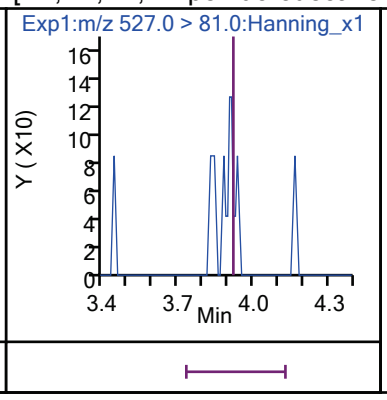


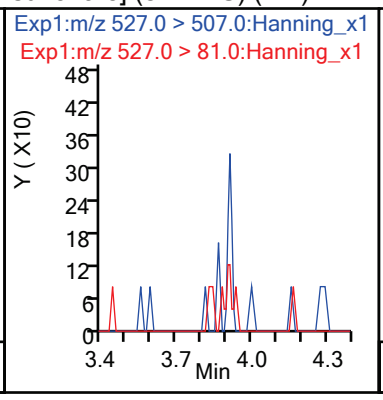
D 55 13C8_PFOSA



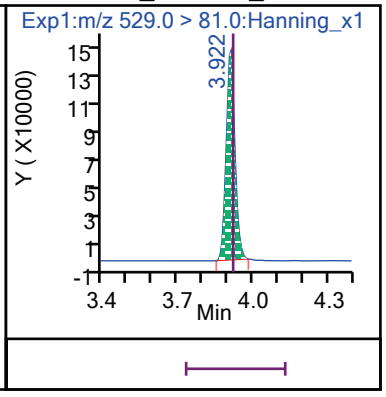
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) (ND)



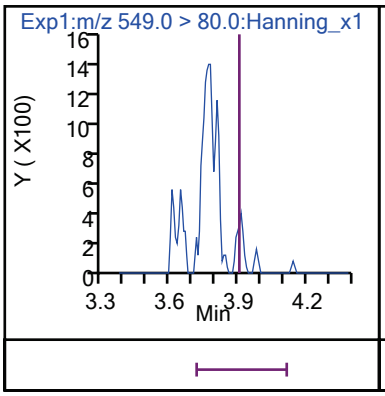


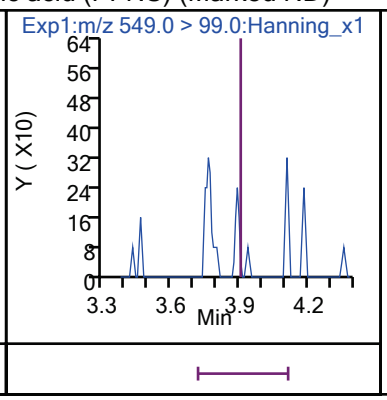


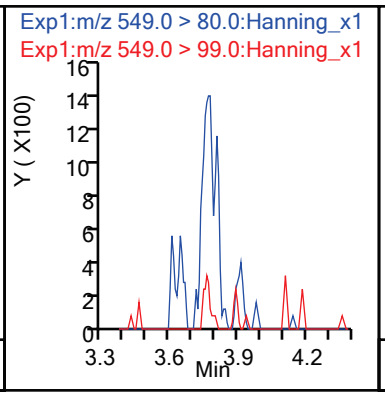
D 65 13C2_8:2 FTS_2



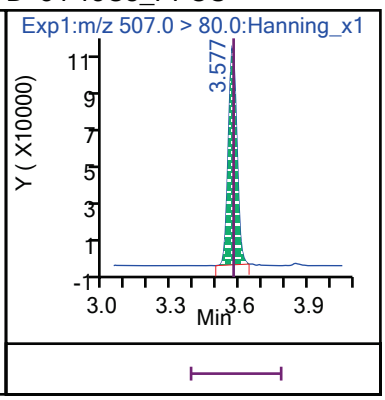
16 Perfluoro-1-nonanesulfonic acid (PFNS) (Marked ND)



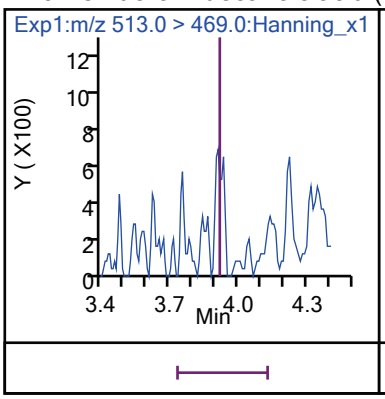


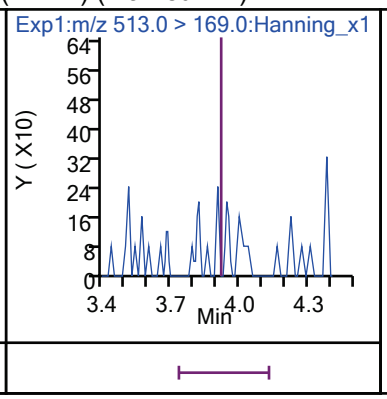


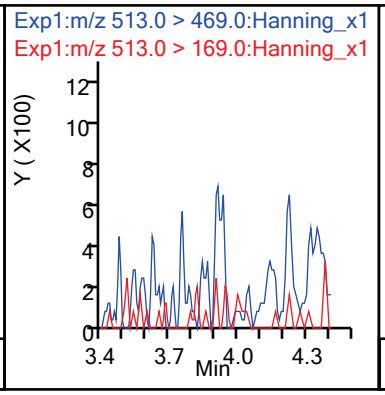
D 54 13C8_PFOS



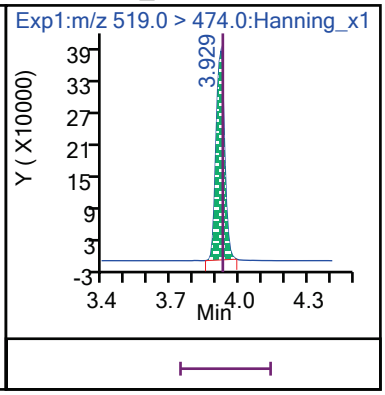
10 Perfluoro-n-decanoic acid (PFDA) (Marked ND)



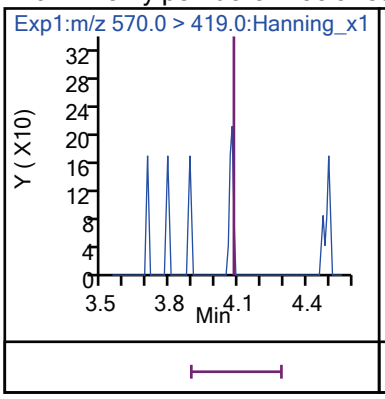


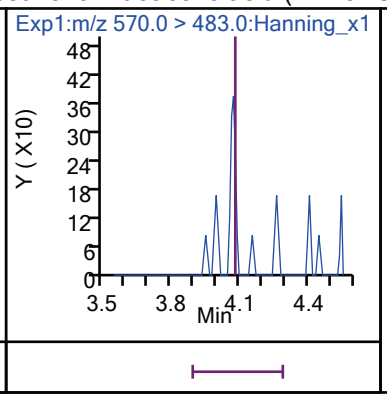


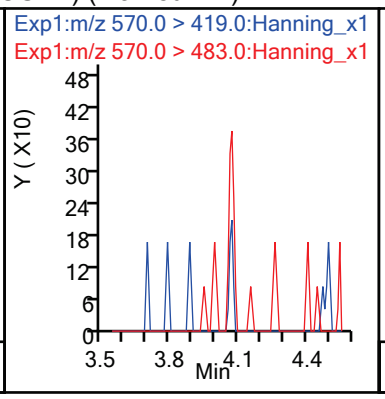
D 51 13C6_PFDA



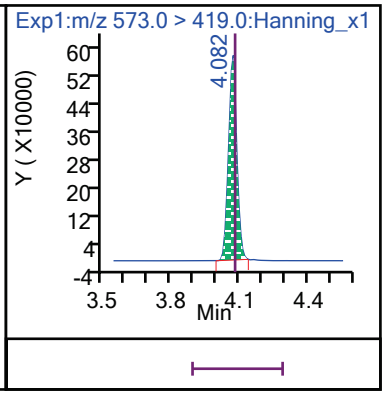
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) (Marked ND)



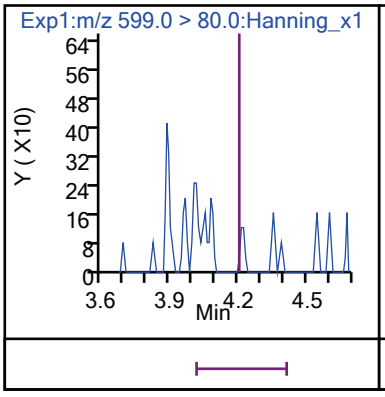


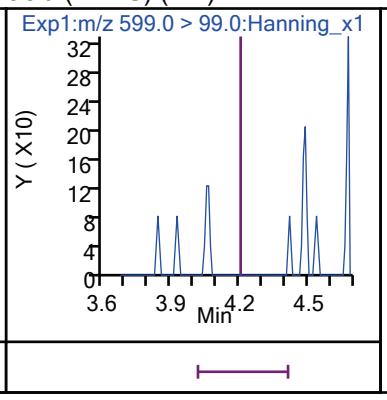


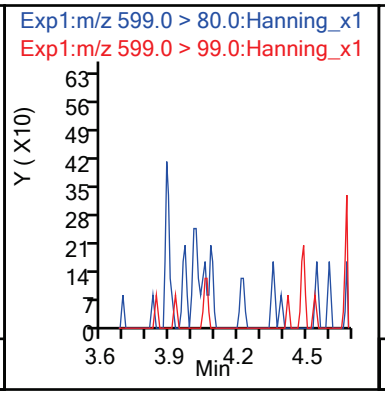
D 58 d3-MeFOSAA



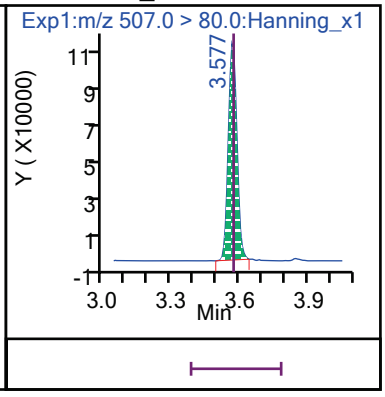
9 Perfluoro-1-decanesulfonic acid (PFDS) (ND)



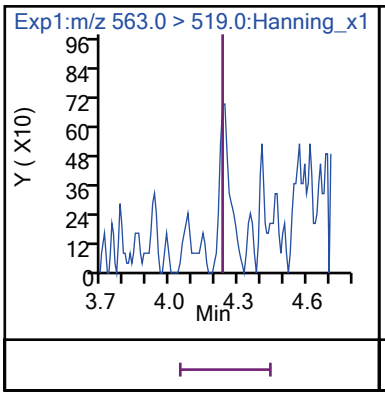


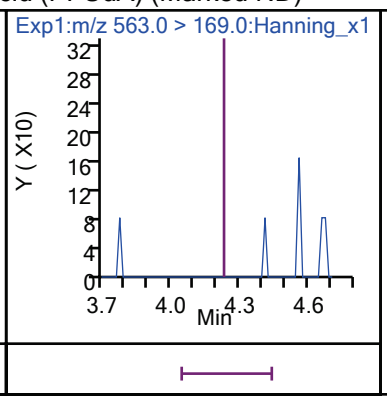


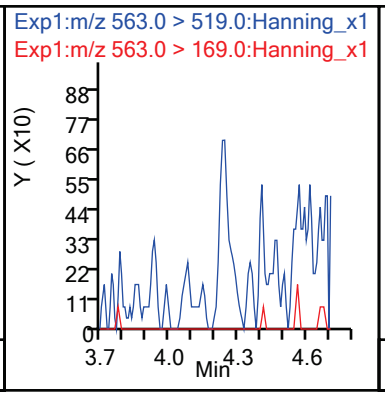
D 54 13C8_PFOS



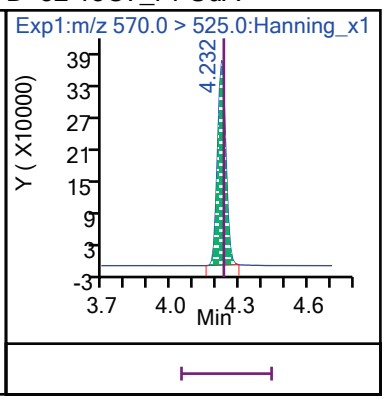
25 Perfluoro-n-undecanoic acid (PFUdA) (Marked ND)



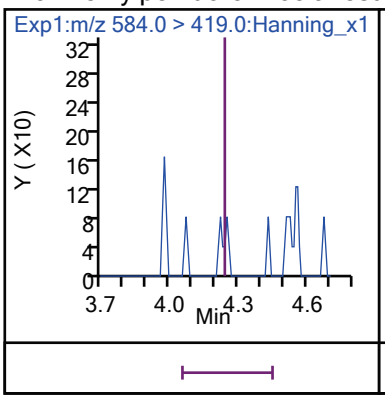


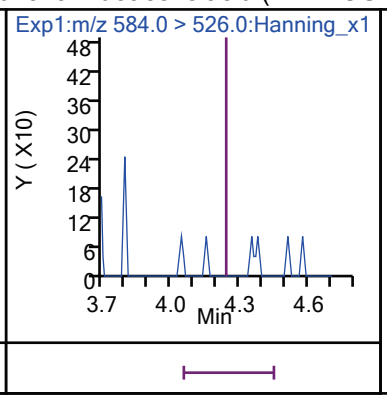


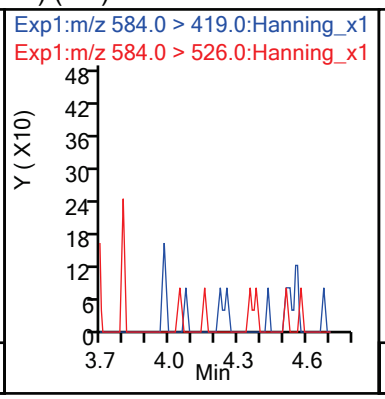
D 52 13C7_PFUdA



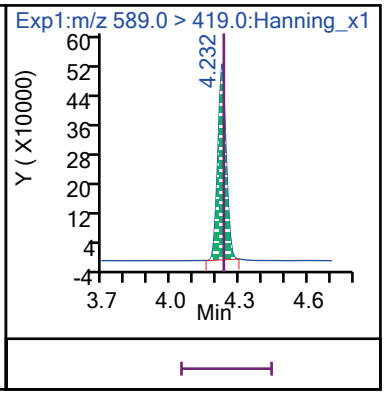
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) (ND)



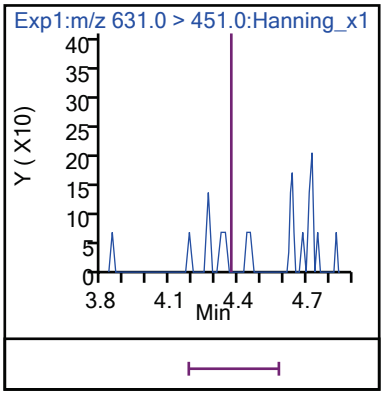




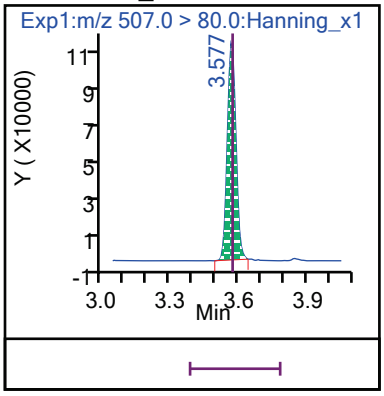
D 60 d5-EtFOSAA



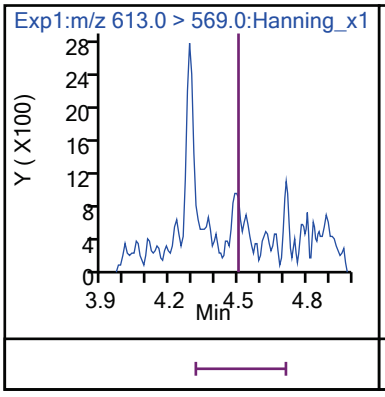
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (Marked ND)

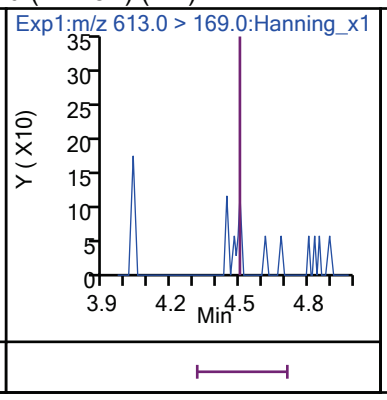


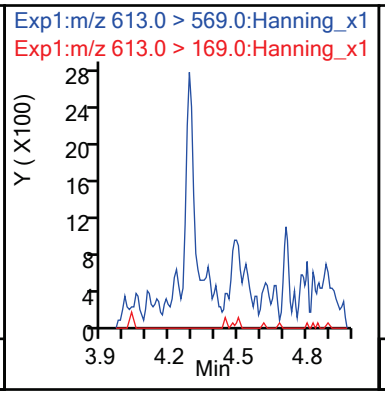
D 54 13C8_PFOS



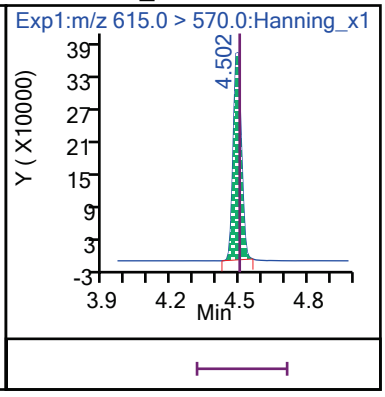
11 Perfluoro-n-dodecanoic acid (PFDoA) (ND)



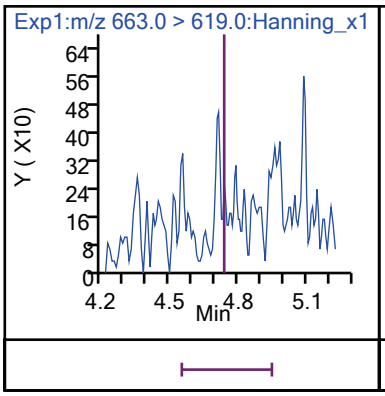


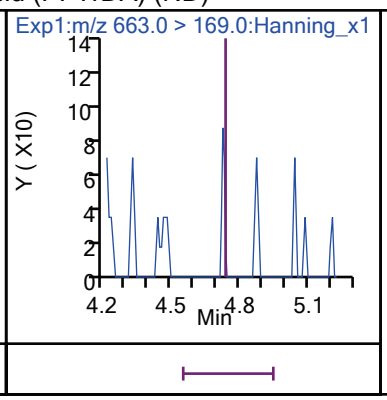


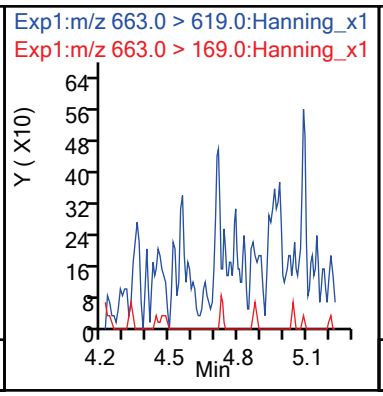
D 38 13C2_PFDoA



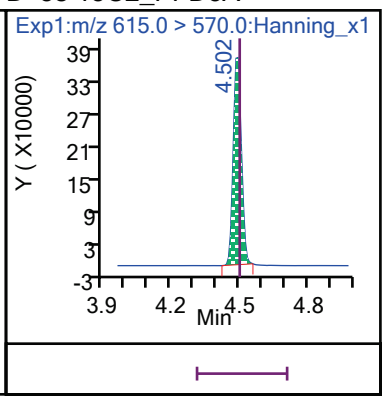
24 Perfluoro-n-tridecanoic acid (PFTrDA) (ND)



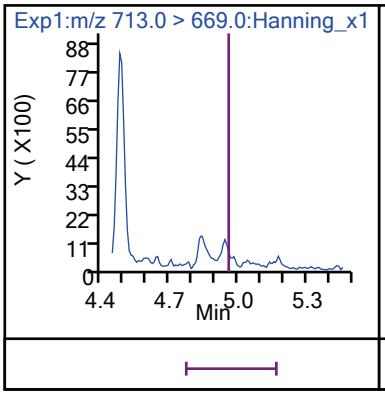


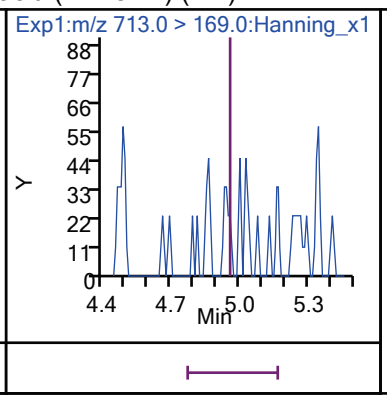


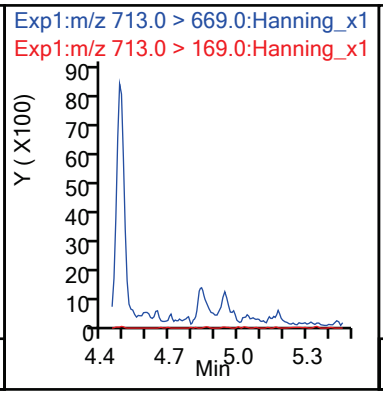
D 38 13C2_PFDoA



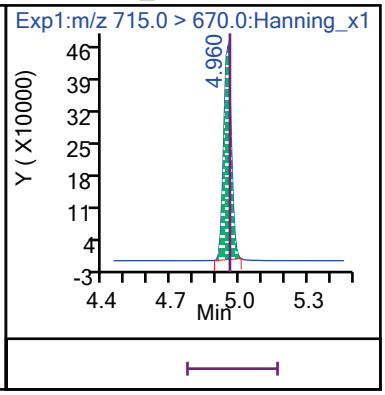
23 Perfluoro-n-tetradecanoic acid (PFTeDA) (ND)



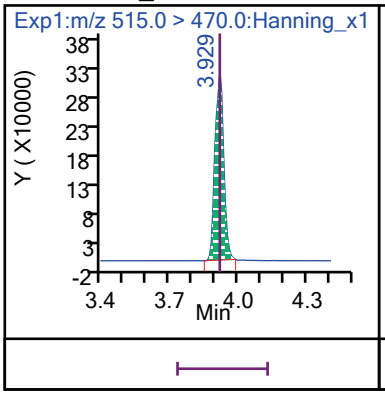




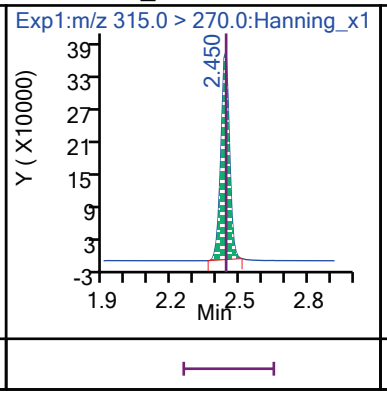
D 42 13C2_PFTeDA



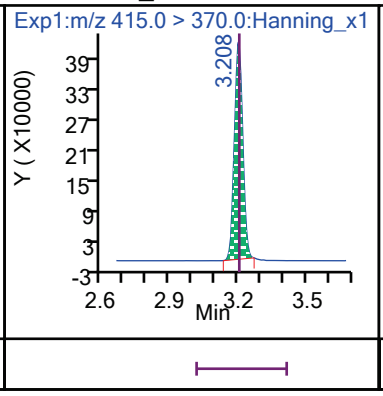
* 37 13C2_PFDA



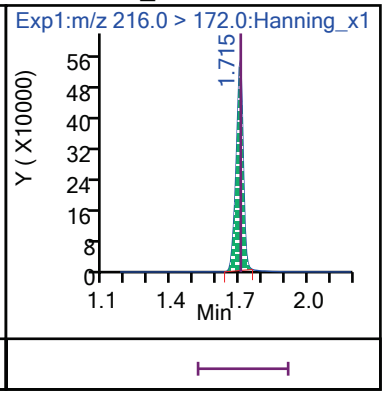
* 39 13C2_PFHxA



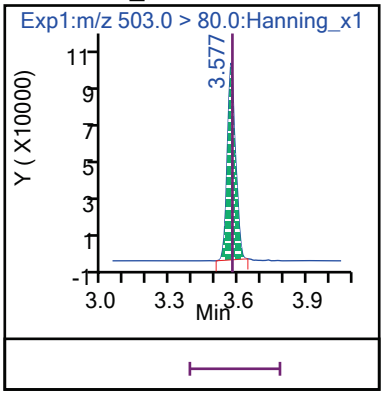
* 41 13C2_PFOA



* 43 13C3_PFBA



* 48 13C4_PFOS



ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 30%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
6:2 FLUOROTELOMER SULFONATE (6:2FTS)	6.2	5.6	7.4	10.17	FALSE	FALSE	FALSE	FALSE
PENTADECAFLUOROOCTANOIC ACID (PFOA)	8.3	8.3	3.7	0.00	FALSE	TRUE	TRUE	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	11	12	3.7	8.70	FALSE	TRUE	TRUE	FALSE
PERFLUOROBUTANOIC ACID (PFBA)	9.2	9.7	3.7	5.29	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEPTANOIC ACID (PFHPA)	3	2.5	3.7	18.18	FALSE	FALSE	FALSE	FALSE
PERFLUOROHEXANESULFONIC ACID (PFHXS)	24	25	3.7	4.08	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEXANOIC ACID (PFHXA)	7.7	7.6	3.7	1.31	FALSE	TRUE	TRUE	FALSE
PERFLURONONANOIC ACID (PFNA)	6.6	7.5	3.7	12.77	FALSE	FALSE	TRUE	FALSE
PERFLUOROOCTANESULFONIC ACID (PFOS)	14	16	3.7	13.33	FALSE	TRUE	TRUE	FALSE
PERFLUOROPENTANESULFONIC ACID (PFPES)	5.1	5.3	3.5	3.85	FALSE	FALSE	FALSE	FALSE
PERFLUOROPENTANOIC ACID (PFPEA)	8.3	8.6	3.7	3.55	FALSE	TRUE	TRUE	FALSE

SDG WG20004

AOPC5-14D12A-071621/AOPC5-14D12A-071621-FD

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122949

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: [signature] [signature]	Analysis (Attach list if more space is needed)	Page 1 of 3
City: Oakland State: CA Zip Code: 94612	X		WG20004
Project Name: NASA ARC PFAS	Printed Name: Ryan Melendez Callie Neaves		KES2
Project No.: 103IG667601 P.O. No.			

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	E-Grab C-Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Meta Filtered	PFAS (QSM B+5)	Remarks / Cooler I.D.
AOPC18-11E02A-071221	7/12/21	1315	G	X			2							X	
AOPC18-WN8-7-071221	7/12/21	1320	G	X			2							X	
AOPC1-11N21A1-071221	7/12/21	1520	G	X			2							X	
AOPC8-W11-2-071221	7/12/21	1610	G	X			2							X	
AOPC6-WU4-18-071221	7/12/21	1805	G	X			2							X	
FB04-071221	7/12/21	1700	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited MT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TE [signature]	7/19/21	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	7/20/21	0955	4. Laboratory received by: [signature]	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on ice (Circle) Yes No Ice Pack Receipt Temp. 1.3 °C Temp Blank ☐ Y ☑ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122959

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x Ann Muz MJ RCMe	Analysis (Attach list if more space is needed)	Page 2 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves Mike Dahlquist Ryan Melendez		WG20004
Project Name: NASA ARC PFAS			KES2
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Comp Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS 10SMB+5	Remarks / Cooler I.D.
AOPC25-15H12A-071321	7/13/21	1245	G	X			2							X	
AOPC25-15B10A-071321	7/13/21	1315	G	X			2							X	
AOPC24-64A-071321	7/13/21	1605	G	X			2							X	
AOPC24-WU4-1-071321	7/13/21	1605	G	X			2							X	
FB-05-071321	7/13/21	1615	G	X			2							X	
AOPC5-WU4-19-071421	7/14/21	1135	G	X			2							X	
AOPC5-14D39A-071421	7/14/21	1620	G	X			2							X	
AOPC3-W7-9-071421	7/14/21	1620	G	X			2							X	
AOPC5-WNB-14-071421	7/14/21	1820	G	X			2							X	
FB-06-071421	7/14/21	1830	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TC Ann Muz	7/19/21	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	7/20/21	0955	4. Laboratory received by: Amy Goodwin	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack
Receipt Temp. 1.3 °C
Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
108 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122967

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: [signature]	Analysis (Attach list if more space is needed)	Page 3 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves, Ryan Melendez, Jessica Robinson		WG20004
Project Name: NASA ARC PFAS			KES2
Project No.: 103IG667601; P.O. No.:			

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	E-Grab C-Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	HSSO4	HNO3	HCl	NaOH	NaOH/	Field Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC1,7-WU4-9-071521	7/15/21	1230	G	x			2							x	
AOPC1,7-P2A1-5C-071521	7/15/21	1500	G	x			6							x	MS/MSD
FB-07-071521	7/15/21	1540	G	x			2							x	
AOPC5-14D12A-071621	7/16/21	1200	G	x			2							x	
AOPC5-14D12A-071621-FD	7/16/21	1200	G	x			2							x	Field duplicate
AOPC3-W19-2-071621	7/16/21	1355	G	x			2							x	
AOPC3-W7-10-071621	7/16/21	1520	G	x			2							x	
AOPC24-171A-071621	7/16/21	1630	G	x			2							x	
FB-08-071621	7/16/21	1610	G	x			2							x	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TE [signature]	7/19/21	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	7/20/21	0955	4. Laboratory received by: [signature]	7/20/21	0955

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY: Received on ice (Circle) Yes No Ice Pack — Receipt Temp. 1.3 °C — Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: JRG2 / 07/20/2021 Lot #: WG200004

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

1.3 / 1.3 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		15. Were any samples containers missing (excess) (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote # _____

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JRG2 Date: 07/20/2021

Comments: Excess: 1-250ml FB-07-071621 7/16 @ 1600

Case Narrative
Tetra Tech
Lot Number: WG20004

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Samples WG20004-004 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

The laboratory control sample (LCS) for analytical batch 10188 recovered outside acceptance criteria for PFPeS. For the following samples there was an insufficient amount to perform a re-extraction or re-analysis: WG20004-019, WG20004-022, WG20004-023, WG20004-024, WG20004-025. The data has been reported.

The continuing calibration verification (CCV) associated with sample WG20004-013 for analyte(s): GenX recovered above the upper control limit. The sample(s) associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

The continuing calibration verification (CCV) associated with samples WG20004-001, WG20004-002, WG20004-006, WG20004-007, WG20004-008, WG20004-009, WG20004-010, WG20004-011, WG20004-012 for analyte: 8:2 FTS recovered above the upper control limit. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

Surrogate recovery for the following sample(s) was outside control limits: WG20004-014. Re-extraction and/or re-analysis was performed with concurring results. Both sets of data have been reported.

Surrogate recovery for the following samplewas outside of acceptance limits: WG20004-026. There was insufficient sample to perform a re-extraction; therefore, the data have been reported.

Surrogate recovery for the following samples was outside control limits: WG20004-004, WG20004-013. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside the upper control limit: WG20004-011. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

The MS/MSD associated with samples WG20004-001, WG20004-018, WG20004-024 had multiple analytes recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

The method blank associated with batches 10113, 10799 had PFOS detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for PFOS have been flagged with a "B".

Sample Summary
Tetra Tech
Lot Number: WG20004
Project Name: NASA ARC PFAS
Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC18-11E02A-071221	Aqueous	07/12/2021 1315	07/20/2021
002	AOPC18-WNB-7-071221	Aqueous	07/12/2021 1320	07/20/2021
003	AOPC1-11N21A1-071221	Aqueous	07/12/2021 1520	07/20/2021
004	AOPC8-W11-2-071221	Aqueous	07/12/2021 1610	07/20/2021
005	AOPC6-WV4-18-071221	Aqueous	07/12/2021 1805	07/20/2021
006	FB04-071221	Aqueous	07/12/2021 1700	07/20/2021
007	AOPC25-15H12A-071321	Aqueous	07/13/2021 1245	07/20/2021
008	AOPC25-15B10A-071321	Aqueous	07/13/2021 1315	07/20/2021
009	AOPC24-64A-071321	Aqueous	07/13/2021 1605	07/20/2021
010	AOPC24-WU4-1-071321	Aqueous	07/13/2021 1605	07/20/2021
011	FB-05-071321	Aqueous	07/13/2021 1615	07/20/2021
012	AOPC5-WU4-19-071421	Aqueous	07/14/2021 1135	07/20/2021
013	AOPC5-14039A-071421	Aqueous	07/14/2021 1620	07/20/2021
014	AOPC3-W7-9-071421	Aqueous	07/14/2021 1620	07/20/2021
015	AOPC5-WNB-14-071421	Aqueous	07/14/2021 1820	07/20/2021
016	FB-06-071421	Aqueous	07/14/2021 1830	07/20/2021
017	AOPC1,7-WU4-9-071521	Aqueous	07/15/2021 1230	07/20/2021
018	AOPC1,7-PZA1-5C-071521	Aqueous	07/15/2021 1500	07/20/2021
019	FB-07-071521	Aqueous	07/15/2021 1540	07/20/2021
020	AOPC5-14D12A-071621	Aqueous	07/16/2021 1200	07/20/2021
021	AOPC5-14D12A-071621-FD	Aqueous	07/16/2021 1200	07/20/2021
022	AOPC3-W19-2-071621	Aqueous	07/16/2021 1355	07/20/2021
023	AOPC3-W7-10-071621	Aqueous	07/16/2021 1520	07/20/2021
024	AOPC24-171A-071621	Aqueous	07/16/2021 1630	07/20/2021
025	FB-08-071621	Aqueous	07/16/2021 1610	07/20/2021
026	FB-07-071621	Aqueous	07/15/2021 1600	07/20/2021

(26 samples)

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20004

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC18-11E02A-071221	129	144	110	91	91	101	91	105	106
AOPC18-WNB-7-071221	114	127	95	83	80	93	92	94	92
AOPC1-11N21A1-071221	96	115	102	90	94	106	99	90	97
AOPC8-W11-2-071221	152 *	123	66	54	54	84	75	78	69
AOPC6-WV4-18-071221	101	107	127	90	86	94	93	86	98
FB04-071221	100	145	98	81	89	94	92	104	100
AOPC25-15H12A-071321	127	135	124	101	94	103	106	100	124
AOPC25-15B10A-071321	117	129	118	85	89	109	89	104	107
AOPC24-64A-071321	118	131	112	88	97	97	90	113	107
AOPC24-WU4-1-071321	105	141	109	90	102	101	96	108	108
FB-05-071321	101	153 *	112	93	82	104	91	116	106
AOPC5-WU4-19-071421	144	116	112	81	73	86	68	95	108
AOPC5-WU4-19-071421	98	105	106	98	93	96	90	97	103
AOPC5-14039A-071421	248 *	148	108	71	76	81	49 *	63	64
AOPC5-14039A-071421	107	109	117	101	109	117	104	108	113
AOPC3-W7-9-071421	277 *	203 *	125	55	56	70	73	75	56
AOPC3-W7-9-071421	186 *	142	93	68	69	72	71	83	67
AOPC5-WNB-14-071421	107	112	94	62	64	69	62	81	61
FB-06-071421	80	100	79	62	59	66	68	83	71
AOPC1,7-WU4-9-071521	84	95	68	68	75	79	75	81	80
AOPC1,7-PZA1-5C-071521	85	110	69	77	74	81	82	83	81
FB-07-071521	93	92	81	80	85	84	86	91	86
AOPC5-14D12A-071621	93	91	78	81	84	85	85	88	105
AOPC5-14D12A-071621	92	94	92	73	77	80	79	90	92
AOPC5-14D12A-071621-FD	99	115	89	90	79	80	84	88	100
AOPC5-14D12A-071621-FD	100	104	101	72	75	82	77	91	93
AOPC3-W19-2-071621	94	97	82	78	70	79	80	85	86
AOPC3-W7-10-071621	108	113	88	76	70	75	76	82	91
AOPC24-171A-071621	93	97	87	84	85	87	84	86	90
FB-08-071621	82	88	83	77	78	82	78	89	84

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20004

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
FB-07-071621	87	122	72	71	45 *	81	79	89	87
WQ99902-001	84	79	71	71	65	71	74	88	81
WQ99902-002	86	89	75	72	73	78	83	94	85
AOPC18-11E02A-071221MS	111	133	96	87	82	104	87	95	97
AOPC18-WNB-7-071221DUP	109	137	103	83	80	96	92	98	96
WQ10113-001	95	93	80	75	78	90	81	95	89
WQ10113-002	93	79	71	81	76	85	78	90	83
AOPC1,7-PZA1-5C-071521MS	84	100	68	66	78	78	74	84	82
AOPC1,7-PZA1-5C-071521MSD	90	105	66	73	75	78	73	80	81
WQ10799-001	88	99	89	78	83	81	81	96	90
WQ10799-002	97	94	91	82	85	86	84	96	90
WQ10799-003	83	94	88	74	79	77	78	88	82
WQ10188-001	86	99	85	81	86	79	76	90	82
WQ10188-002	66	82	81	71	75	71	72	79	73
AOPC24-171A-071621MS	87	90	77	80	83	80	80	87	85
WQ10648-001	73	84	74	68	70	70	74	78	74
WQ10648-002	79	75	80	70	73	70	73	78	74

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20004

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC18-11E02A-071221	100	103	99	89	97	113	85	106	
AOPC18-WNB-7-071221	97	101	96	80	100	110	88	95	
AOPC1-11N21A1-071221	100	103	95	97	108	100	99	101	
AOPC8-W11-2-071221	77	87	81	70	64	81	60	72	
AOPC6-WV4-18-071221	94	94	98	96	104	93	91	102	
FB04-071221	91	104	101	93	98	116	84	100	
AOPC25-15H12A-071321	99	113	113	103	101	116	98	113	
AOPC25-15B10A-071321	90	119	108	94	98	110	96	104	
AOPC24-64A-071321	98	102	94	97	94	110	91	97	
AOPC24-WU4-1-071321	99	108	107	96	104	113	93	124	
FB-05-071321	105	103	104	90	95	117	90	111	
AOPC5-WU4-19-071421	83	96	100	102	93	101	79	105	
AOPC5-WU4-19-071421	95	98	88	91	100	92	91	104	
AOPC5-14039A-071421	68	77	71	89	71	81	24 *	78	
AOPC5-14039A-071421	112	100	100	100	116	110	107	124	
AOPC3-W7-9-071421	84	68	69	88	71	87	70	84	
AOPC3-W7-9-071421	88	76	74	83	81	88	72	75	
AOPC5-WNB-14-071421	75	67	70	70	69	74	68	83	
FB-06-071421	62	71	65	61	64	77	61	70	
AOPC1,7-WU4-9-071521	68	80	76	73	67	81	75	73	
AOPC1,7-PZA1-5C-071521	83	80	78	77	72	83	70	76	
FB-07-071521	85	80	89	81	85	94	79	88	
AOPC5-14D12A-071621	89	79	92	84	83	96	81	88	
AOPC5-14D12A-071621	86	81	83	74	77	94	77	90	
AOPC5-14D12A-071621-FD	91	82	89	83	88	100	77	85	
AOPC5-14D12A-071621-FD	90	81	89	82	69	95	82	89	
AOPC3-W19-2-071621	87	79	88	74	78	88	71	75	
AOPC3-W7-10-071621	84	80	88	73	76	84	76	73	
AOPC24-171A-071621	86	84	90	77	78	91	76	83	
FB-08-071621	89	82	88	77	82	89	84	81	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20004

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
FB-07-071621	82	81	87	74	75	107	71	79	
WQ99902-001	75	81	81	76	67	81	71	78	
WQ99902-002	82	79	85	82	80	87	76	82	
AOPC18-11E02A-071221MS	92	97	95	98	79	109	89	109	
AOPC18-WNB-7-071221DUP	97	107	87	94	87	107	92	100	
WQ10113-001	95	88	82	78	75	84	82	87	
WQ10113-002	85	82	79	81	76	81	82	78	
AOPC1,7-PZA1-5C-071521MS	76	81	77	75	71	80	73	71	
AOPC1,7-PZA1-5C-071521MSD	76	78	80	79	75	81	78	75	
WQ10799-001	91	84	91	85	90	96	80	81	
WQ10799-002	87	88	89	83	89	91	80	84	
WQ10799-003	79	86	85	82	87	87	76	72	
WQ10188-001	86	77	83	83	89	98	80	81	
WQ10188-002	81	74	80	71	69	83	73	70	
AOPC24-171A-071621MS	87	80	92	76	78	91	88	81	
WQ10648-001	76	72	78	74	71	78	66	75	
WQ10648-002	69	77	76	74	76	77	72	79	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20004

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC18-11E02A-071221	95	109	97						0
AOPC18-WNB-7-071221	96	97	87						0
AOPC1-11N21A1-071221	96	85	97						0
AOPC8-W11-2-071221	79	40 *	47 *						3
AOPC6-WV4-18-071221	97	89	100						0
FB04-071221	96	95	93						0
AOPC25-15H12A-071321	111	104	103						0
AOPC25-15B10A-071321	100	102	93						0
AOPC24-64A-071321	114	98	98						0
AOPC24-WU4-1-071321	96	115	96						0
FB-05-071321	101	103	101						1
AOPC5-WU4-19-071421	85	97	96						0
AOPC5-WU4-19-071421	95	90	104						0
AOPC5-14039A-071421	28 *	77	92						4
AOPC5-14039A-071421	105	112	111						0
AOPC3-W7-9-071421	84	80	88						2
AOPC3-W7-9-071421	81	78	80						1
AOPC5-WNB-14-071421	73	77	78						0
FB-06-071421	69	72	72						0
AOPC1,7-WU4-9-071521	79	78	77						0
AOPC1,7-PZA1-5C-071521	80	80	81						0
FB-07-071521	86	87	90						0
AOPC5-14D12A-071621	90	87	89						0
AOPC5-14D12A-071621	84	77	86						0
AOPC5-14D12A-071621-FD	87	91	91						0
AOPC5-14D12A-071621-FD	79	87	85						0
AOPC3-W19-2-071621	86	77	87						0
AOPC3-W7-10-071621	94	79	87						0
AOPC24-171A-071621	89	82	90						0
FB-08-071621	96	85	87						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG20004

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
FB-07-071621	83	88	85						1
WQ99902-001	77	78	77						0
WQ99902-002	82	84	83						0
AOPC18-11E02A-071221MS	89	96	93						0
AOPC18-WNB-7-071221DUP	98	96	84						0
WQ10113-001	86	96	81						0
WQ10113-002	88	84	91						0
AOPC1,7-PZA1-5C-071521MS	86	82	81						0
AOPC1,7-PZA1-5C-071521MSD	81	82	81						0
WQ10799-001	87	93	82						0
WQ10799-002	87	85	80						0
WQ10799-003	81	85	79						0
WQ10188-001	90	87	88						0
WQ10188-002	78	74	73						0
AOPC24-171A-071621MS	83	81	85						0
WQ10648-001	75	77	73						0
WQ10648-002	76	79	72						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

CLIENT SAMPLE ID

WQ10113-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG20004

Project No.: 103IG667601
Lab Sample ID: WQ10113-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex 4500_LCMSMS1
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/27/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/28/2021

Time Analyzed: 20:09

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC5-14039A-071421	WG20004-013		20:52
AOPC5-14039A-071421	WG20004-013		10:36
AOPC3-W7-9-071421	WG20004-014		00:27
AOPC5-WNB-14-071421	WG20004-015		00:37
FB-06-071421	WG20004-016		00:48
AOPC1,7-WU4-9-071521	WG20004-017		21:34
AOPC1,7-PZA1-5C-071521	WG20004-018		21:45
WQ10113-002	WQ10113-002		20:20
AOPC1,7-PZA1-5C-071521MS	WG20004-018MS		21:55
AOPC1,7-PZA1-5C-071521MSD	WG20004-018MD		22:06

PFAS by LC/MS/MS - MB

Sample ID: WQ10113-001
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 2009
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 2009
PFOS	1.6	J	1	4.0	2.0	1.0	ng/L	07/28/2021 2009

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		80	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10113-001
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		78	50-150
13C7_PFUdA		75	50-150
13C8_PFOA		84	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10113-002
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	17		1	112	70-150	07/28/2021 2020
11Cl-PF3OUdS	15	16		1	108	70-150	07/28/2021 2020
8:2 FTS	15	17		1	113	67-138	07/28/2021 2020
6:2 FTS	15	16		1	108	64-140	07/28/2021 2020
4:2 FTS	15	17		1	116	63-143	07/28/2021 2020
GenX	32	34		1	106	70-150	07/28/2021 2020
ADONA	15	18		1	122	70-150	07/28/2021 2020
EtFOSAA	16	18		1	115	61-135	07/28/2021 2020
MeFOSAA	16	16		1	99	65-136	07/28/2021 2020
PFBS	14	18		1	125	72-130	07/28/2021 2020
PFDS	15	21		1	139	53-142	07/28/2021 2020
PFHpS	15	18		1	120	69-134	07/28/2021 2020
PFNS	15	14		1	92	69-127	07/28/2021 2020
PFOSA	16	18		1	114	67-137	07/28/2021 2020
PFPeS	15	17		1	112	71-127	07/28/2021 2020
PFHxS	15	16		1	108	68-131	07/28/2021 2020
PFBA	16	19		1	116	73-129	07/28/2021 2020
PFDA	16	19		1	117	71-129	07/28/2021 2020
PFDoA	16	20		1	125	72-134	07/28/2021 2020
PFHpA	16	17		1	107	72-130	07/28/2021 2020
PFHxA	16	20		1	127	72-129	07/28/2021 2020
PFNA	16	17		1	107	69-130	07/28/2021 2020
PFOA	16	19		1	122	71-133	07/28/2021 2020
PFPeA	16	17		1	108	72-129	07/28/2021 2020
PFTeDA	16	19		1	119	71-132	07/28/2021 2020
PFTrDA	16	16		1	100	65-144	07/28/2021 2020
PFUdA	16	18		1	110	69-133	07/28/2021 2020
PFOS	15	15		1	102	65-140	07/28/2021 2020

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	50-150
13C2_6:2FTS		79	50-150
13C2_8:2FTS		71	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		78	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10113-002
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		81	50-150
13C7_PFUdA		76	50-150
13C8_PFOA		81	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		78	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-018MS AOPC1,7-PZA1-5C-071521 Matrix: Aqueous
Batch: 10113 Prep Method: SOP SPE
Analytical Method: PFAS by ID SOP QSM B-15 Prep Date: 07/27/2021 1332

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	17		1	125	70-150	07/28/2021 2155
11Cl-PF3OUdS	ND	14	16		1	118	70-150	07/28/2021 2155
8:2 FTS	ND	14	17		1	124	67-138	07/28/2021 2155
6:2 FTS	ND	14	18		1	129	64-140	07/28/2021 2155
4:2 FTS	ND	14	17		1	125	63-143	07/28/2021 2155
GenX	ND	29	35		1	119	70-150	07/28/2021 2155
ADONA	ND	14	18		1	134	70-150	07/28/2021 2155
EtFOSAA	ND	15	17		1	115	61-135	07/28/2021 2155
MeFOSAA	ND	15	19		1	132	65-136	07/28/2021 2155
PFBS	21	13	37		1	120	72-130	07/28/2021 2155
PFDS	ND	14	18		1	127	53-142	07/28/2021 2155
PFHpS	2.4	14	20		1	129	69-134	07/28/2021 2155
PFNS	ND	14	17		1	118	69-127	07/28/2021 2155
PFOSA	ND	15	18		1	124	67-137	07/28/2021 2155
PFPeS	27	14	39		1	86	71-127	07/28/2021 2155
PFHxS	250	13	290	N	1	270	68-131	07/28/2021 2155
PFBA	13	15	31		1	122	73-129	07/28/2021 2155
PFDA	ND	15	19		1	129	71-129	07/28/2021 2155
PFDoA	ND	15	19		1	130	72-134	07/28/2021 2155
PFHpA	7.4	15	26		1	126	72-130	07/28/2021 2155
PFHxA	22	15	38		1	113	72-129	07/28/2021 2155
PFNA	ND	15	16		1	110	69-130	07/28/2021 2155
PFOA	38	15	58		1	132	71-133	07/28/2021 2155
PFPeA	17	15	34		1	119	72-129	07/28/2021 2155
PFTeDA	ND	15	19		1	130	71-132	07/28/2021 2155
PFTrDA	ND	15	20		1	136	65-144	07/28/2021 2155
PFUdA	ND	15	16		1	110	69-133	07/28/2021 2155
PFOS	110	14	120		1	95	65-140	07/28/2021 2155

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		84	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		68	50-150
13C2_PFDoA		66	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		77	50-150

NO ACTION FOR PFHxS
SAMPLE AMOUNT > 4X SPIKE AMOUNT

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-018MS
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	50-150
13C7_PFUdA		71	50-150
13C8_PFOA		80	50-150
13C8_PFOS		73	50-150
13C8_PFOSA		71	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20004-018MD AOPC1,7-PZA1-5C-071521 Matrix: Aqueous
Batch: 10113 Prep Method: SOP SPE
Analytical Method: PFAS by ID SOP QSM B-15 Prep Date: 07/27/2021 1332

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	14	16		1	115	5.9	70-150	30	07/28/2021 2206
11Cl-PF3OUdS	ND	14	16		1	113	2.5	70-150	30	07/28/2021 2206
8:2 FTS	ND	14	20	N	1	142	16	67-138	30	07/28/2021 2206
6:2 FTS	ND	14	17		1	118	7.2	64-140	30	07/28/2021 2206
4:2 FTS	ND	14	18		1	127	3.5	63-143	30	07/28/2021 2206
GenX	ND	30	36		1	120	2.3	70-150	30	07/28/2021 2206
ADONA	ND	14	19		1	136	3.2	70-150	30	07/28/2021 2206
EtFOSAA	ND	15	18		1	123	8.6	61-135	30	07/28/2021 2206
MeFOSAA	ND	15	19		1	125	3.7	65-136	30	07/28/2021 2206
PFBS	21	13	40	N	1	139	7.5	72-130	30	07/28/2021 2206
PFDS	ND	14	17		1	115	8.2	53-142	30	07/28/2021 2206
PFHpS	2.4	14	21		1	134	5.1	69-134	30	07/28/2021 2206
PFNS	ND	14	17		1	122	4.9	69-127	30	07/28/2021 2206
PFOSA	ND	15	22	N	1	146	18	67-137	30	07/28/2021 2206
PFPeS	27	14	45		1	123	13	71-127	30	07/28/2021 2206
PFHxS	250	14	300	N	1	313	2.2	68-131	30	07/28/2021 2206
PFBA	13	15	31		1	123	1.3	73-129	30	07/28/2021 2206
PFDA	ND	15	18		1	124	2.6	71-129	30	07/28/2021 2206
PFDoA	ND	15	18		1	124	3.2	72-134	30	07/28/2021 2206
PFHpA	7.4	15	26		1	127	1.9	72-130	30	07/28/2021 2206
PFHxA	22	15	40		1	122	4.2	72-129	30	07/28/2021 2206
PFNA	ND	15	20	N	1	133	21	69-130	30	07/28/2021 2206
PFOA	38	15	57		1	127	0.59	71-133	30	07/28/2021 2206
PFPeA	17	15	34		1	114	1.1	72-129	30	07/28/2021 2206
PFTeDA	ND	15	20		1	131	3.3	71-132	30	07/28/2021 2206
PFTrDA	ND	15	18		1	119	12	65-144	30	07/28/2021 2206
PFUdA	ND	15	17		1	117	7.8	69-133	30	07/28/2021 2206
PFOS	110	14	130		1	137	4.9	65-140	30	07/28/2021 2206

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		90	50-150
13C2_6:2FTS		105	50-150
13C2_8:2FTS		66	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		80	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		80	50-150

NO ACTION FOR PFHxS
SAMPLE AMOUNT > 4X SPIKE AMOUNT

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG20004-018MD
Batch: 10113
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1332

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	50-150
13C7_PFUdA		75	50-150
13C8_PFOA		81	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

CLIENT SAMPLE ID

WQ10188-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG20004

Project No.: 103IG667601
Lab Sample ID: WQ10188-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/27/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/28/2021

Time Analyzed: 13:10

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
FB-07-071521	WG20004-019		15:50
AOPC5-14D12A-071621	WG20004-020		16:01
AOPC5-14D12A-071621-FD	WG20004-021		16:11
AOPC3-W19-2-071621	WG20004-022		16:22
AOPC3-W7-10-071621	WG20004-023		16:33
AOPC24-171A-071621	WG20004-024		16:43
FB-08-071621	WG20004-025		17:04
FB-07-071621	WG20004-026		17:15
WQ10188-002	WQ10188-002		13:21
AOPC24-171A-071621MS	WG20004-024MS		16:54

PFAS by LC/MS/MS - MB

Sample ID: WQ10188-001
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		76	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10188-001
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		98	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10188-002
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	18		1	122	70-150	07/28/2021 1321
11Cl-PF3OUdS	15	18		1	117	70-150	07/28/2021 1321
8:2 FTS	15	15		1	101	67-138	07/28/2021 1321
6:2 FTS	15	15		1	99	64-140	07/28/2021 1321
4:2 FTS	15	21		1	143	63-143	07/28/2021 1321
GenX	32	36		1	113	70-150	07/28/2021 1321
ADONA	15	20		1	129	70-150	07/28/2021 1321
EtFOSAA	16	18		1	113	61-135	07/28/2021 1321
MeFOSAA	16	16		1	103	65-136	07/28/2021 1321
PFBS	14	18		1	124	72-130	07/28/2021 1321
PFDS	15	17		1	113	53-142	07/28/2021 1321
PFHpS	15	20		1	133	69-134	07/28/2021 1321
PFNS	15	17		1	109	69-127	07/28/2021 1321
PFOSA	16	19		1	122	67-137	07/28/2021 1321
PFPeS	15	20	N	1	134	71-127	07/28/2021 1321
PFHxS	15	18		1	122	68-131	07/28/2021 1321
PFBA	16	20		1	123	73-129	07/28/2021 1321
PFDA	16	19		1	120	71-129	07/28/2021 1321
PFDoA	16	20		1	127	72-134	07/28/2021 1321
PFHpA	16	19		1	119	72-130	07/28/2021 1321
PFHxA	16	19		1	118	72-129	07/28/2021 1321
PFNA	16	18		1	114	69-130	07/28/2021 1321
PFOA	16	19		1	118	71-133	07/28/2021 1321
PFPeA	16	18		1	114	72-129	07/28/2021 1321
PFTeDA	16	19		1	117	71-132	07/28/2021 1321
PFTrDA	16	23		1	141	65-144	07/28/2021 1321
PFUdA	16	20		1	124	69-133	07/28/2021 1321
PFOS	15	18		1	122	65-140	07/28/2021 1321

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		66	50-150
13C2_6:2FTS		82	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		71	50-150
13C3_PFHxS		72	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		73	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		74	50-150
13C5_PFPeA		80	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10188-002
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		71	50-150
13C7_PFUdA		69	50-150
13C8_PFOA		83	50-150
13C8_PFOS		73	50-150
13C8_PFOSA		70	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		74	50-150
d3-MeFOSAA		73	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-024MS AOPC24-171A-071621 Matrix: Aqueous
Batch: 10188 Prep Method: SOP SPE
Analytical Method: PFAS by ID SOP QSM B-15 Prep Date: 07/27/2021 1619

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	16		1	115	70-150	07/28/2021 1654
11Cl-PF3OUdS	ND	14	15		1	102	70-150	07/28/2021 1654
8:2 FTS	ND	14	19		1	133	67-138	07/28/2021 1654
6:2 FTS	ND	14	14		1	99	64-140	07/28/2021 1654
4:2 FTS	ND	14	16		1	115	63-143	07/28/2021 1654
GenX	ND	30	34		1	112	70-150	07/28/2021 1654
ADONA	ND	14	18		1	129	70-150	07/28/2021 1654
EtFOSAA	ND	15	17		1	111	61-135	07/28/2021 1654
MeFOSAA	ND	15	19		1	125	65-136	07/28/2021 1654
PFBS	6.2	13	23		1	124	72-130	07/28/2021 1654
PFDS	ND	15	17		1	114	53-142	07/28/2021 1654
PFHpS	ND	14	17		1	121	69-134	07/28/2021 1654
PFNS	ND	14	16		1	113	69-127	07/28/2021 1654
PFOSA	ND	15	18		1	121	67-137	07/28/2021 1654
PFPeS	2.0	14	19		1	117	71-127	07/28/2021 1654
PFHxS	7.0	14	25		1	129	68-131	07/28/2021 1654
PFBA	4.4	15	23		1	123	73-129	07/28/2021 1654
PFDA	ND	15	20	N	1	130	71-129	07/28/2021 1654
PFDoA	ND	15	19		1	124	72-134	07/28/2021 1654
PFHpA	ND	15	18		1	119	72-130	07/28/2021 1654
PFHxA	1.5	15	18		1	113	72-129	07/28/2021 1654
PFNA	ND	15	20	N	1	132	69-130	07/28/2021 1654
PFOA	2.7	15	21		1	119	71-133	07/28/2021 1654
PFPeA	1.7	15	19		1	117	72-129	07/28/2021 1654
PFTeDA	ND	15	18		1	118	71-132	07/28/2021 1654
PFTrDA	ND	15	21		1	137	65-144	07/28/2021 1654
PFUdA	ND	15	21	N	1	139	69-133	07/28/2021 1654
PFOS	4.2	14	17		1	94	65-140	07/28/2021 1654

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		87	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		77	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-024MS
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		76	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		91	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

CLIENT SAMPLE ID

WQ10648-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG20004

Project No.: 103IG667601
Lab Sample ID: WQ10648-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/30/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/31/2021

Time Analyzed: 16:26

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC5-14D12A-071621	WG20004-020		17:00
AOPC5-14D12A-071621-FD	WG20004-021		17:11
WQ10648-002	WQ10648-002		16:37

PFAS by LC/MS/MS - MB

Sample ID: WQ10648-001
Batch: 10648
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/30/2021 1838

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1626

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		73	50-150
13C2_6:2FTS		84	50-150
13C2_8:2FTS		74	50-150
13C2_PFDoA		68	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		70	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		74	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		72	50-150
13C5_PFPeA		78	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		71	50-150
13C8_PFOA		78	50-150
13C8_PFOS		66	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		75	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		73	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10648-002
Batch: 10648
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/30/2021 1838

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
PFPeS	15	15		1	102	71-127	07/31/2021 1637

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		79	50-150
13C2_6:2FTS		75	50-150
13C2_8:2FTS		80	50-150
13C2_PFDoA		70	50-150
13C2_PFTeDA		73	50-150
13C3_PFBS		70	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		74	50-150
13C4_PFHpA		69	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		76	50-150
13C8_PFOA		77	50-150
13C8_PFOS		72	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		76	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		72	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

CLIENT SAMPLE ID

WQ10799-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG20004

Project No.: 103IG667601
Lab Sample ID: WQ10799-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 08/02/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 08/04/2021

Time Analyzed: 13:42

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC3-W7-9-071421	WG20004-014		14:36
WQ10799-002	WQ10799-002		14:04
WQ10799-003	WQ10799-003		14:14

PFAS by LC/MS/MS - MB

Sample ID: WQ10799-001
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1342
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1342

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10799-001
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		96	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10799-002
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	109	70-150	08/04/2021 1404
11Cl-PF3OUdS	15	16		1	105	70-150	08/04/2021 1404
8:2 FTS	15	13		1	82	67-138	08/04/2021 1404
6:2 FTS	15	12		1	78	64-140	08/04/2021 1404
4:2 FTS	15	15		1	103	63-143	08/04/2021 1404
GenX	32	32		1	99	70-150	08/04/2021 1404
ADONA	15	17		1	115	70-150	08/04/2021 1404
EtFOSAA	16	16		1	101	61-135	08/04/2021 1404
MeFOSAA	16	19		1	116	65-136	08/04/2021 1404
PFBS	14	14		1	101	72-130	08/04/2021 1404
PFDS	15	16		1	104	53-142	08/04/2021 1404
PFHpS	15	15		1	99	69-134	08/04/2021 1404
PFNS	15	17		1	108	69-127	08/04/2021 1404
PFOSA	16	17		1	105	67-137	08/04/2021 1404
PFPeS	15	16		1	109	71-127	08/04/2021 1404
PFHxS	15	16		1	111	68-131	08/04/2021 1404
PFBA	16	17		1	107	73-129	08/04/2021 1404
PFDA	16	17		1	105	71-129	08/04/2021 1404
PFDoA	16	18		1	110	72-134	08/04/2021 1404
PFHpA	16	17		1	103	72-130	08/04/2021 1404
PFHxA	16	17		1	106	72-129	08/04/2021 1404
PFNA	16	18		1	110	69-130	08/04/2021 1404
PFOA	16	19		1	117	71-133	08/04/2021 1404
PFPeA	16	17		1	106	72-129	08/04/2021 1404
PFTeDA	16	17		1	107	71-132	08/04/2021 1404
PFTrDA	16	19		1	116	65-144	08/04/2021 1404
PFUdA	16	18		1	113	69-133	08/04/2021 1404
PFOS	15	16		1	108	65-140	08/04/2021 1404

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		82	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		89	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10799-002
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		91	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		80	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCSD

Sample ID: WQ10799-003
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	15		1	103	5.0	70-150	30	08/04/2021 1414
11Cl-PF3OUdS	15	14		1	95	9.9	70-150	30	08/04/2021 1414
8:2 FTS	15	15		1	99	18	67-138	30	08/04/2021 1414
6:2 FTS	15	12		1	79	0.76	64-140	30	08/04/2021 1414
4:2 FTS	15	16		1	105	1.7	63-143	30	08/04/2021 1414
GenX	32	31		1	98	0.85	70-150	30	08/04/2021 1414
ADONA	15	15		1	102	12	70-150	30	08/04/2021 1414
EtFOSAA	16	13		1	82	20	61-135	30	08/04/2021 1414
MeFOSAA	16	15		1	91	24	65-136	30	08/04/2021 1414
PFBS	14	14		1	96	4.6	72-130	30	08/04/2021 1414
PFDS	15	14		1	92	12	53-142	30	08/04/2021 1414
PFHpS	15	15		1	102	3.0	69-134	30	08/04/2021 1414
PFNS	15	15		1	98	9.8	69-127	30	08/04/2021 1414
PFOSA	16	17		1	105	0.14	67-137	30	08/04/2021 1414
PFPeS	15	14		1	96	12	71-127	30	08/04/2021 1414
PFHxS	15	15		1	104	6.4	68-131	30	08/04/2021 1414
PFBA	16	17		1	104	2.6	73-129	30	08/04/2021 1414
PFDA	16	17		1	109	3.8	71-129	30	08/04/2021 1414
PFDoA	16	17		1	107	2.9	72-134	30	08/04/2021 1414
PFHpA	16	16		1	99	4.6	72-130	30	08/04/2021 1414
PFHxA	16	15		1	94	11	72-129	30	08/04/2021 1414
PFNA	16	16		1	97	13	69-130	30	08/04/2021 1414
PFOA	16	17		1	108	7.5	71-133	30	08/04/2021 1414
PFPeA	16	16		1	101	5.6	72-129	30	08/04/2021 1414
PFTeDA	16	16		1	103	3.7	71-132	30	08/04/2021 1414
PFTrDA	16	20		1	123	5.9	65-144	30	08/04/2021 1414
PFUdA	16	16		1	103	9.3	69-133	30	08/04/2021 1414
PFOS	15	15		1	99	9.4	65-140	30	08/04/2021 1414

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		83	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		77	50-150
13C3_PFHxS		78	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		79	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCSD

Sample ID: WQ10799-003
Batch: 10799
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/02/2021 1842

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		87	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		72	50-150
13C9_PFNA		81	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

CLIENT SAMPLE ID

WQ99902-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG20004

Project No.: 103IG667601
Lab Sample ID: WQ99902-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex 4500_LCMSMS1
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/23/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/25/2021

Time Analyzed: 23:08

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC18-11E02A-071221	WG20004-001		15:36
AOPC18-WNB-7-071221	WG20004-002		15:57
AOPC1-11N21A1-071221	WG20004-003		14:40
AOPC8-W11-2-071221	WG20004-004		14:51
AOPC6-WV4-18-071221	WG20004-005		15:01
FB04-071221	WG20004-006		17:12
AOPC25-15H12A-071321	WG20004-007		17:22
AOPC25-15B10A-071321	WG20004-008		17:33
AOPC24-64A-071321	WG20004-009		17:44
AOPC24-WU4-1-071321	WG20004-010		17:54
FB-05-071321	WG20004-011		18:05
AOPC5-WU4-19-071421	WG20004-012		18:15
AOPC5-WU4-19-071421	WG20004-012		15:12
WQ99902-002	WQ99902-002		23:18
AOPC18-11E02A-071221MS	WG20004-001MS		15:47
AOPC18-WNB-7-071221DUP	WG20004-002DU		16:08

PFAS by LC/MS/MS - MB

Sample ID: WQ99902-001
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/25/2021 2308
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/25/2021 2308

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		84	50-150
13C2_6:2FTS		79	50-150
13C2_8:2FTS		71	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		65	50-150
13C3_PFBS		71	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		75	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ99902-001
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		76	50-150
13C7_PFUdA		67	50-150
13C8_PFOA		81	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		78	50-150
13C9_PFNA		77	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99902-002
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	107	70-150	07/25/2021 2318
11Cl-PF3OUdS	15	14		1	95	70-150	07/25/2021 2318
8:2 FTS	15	18		1	118	67-138	07/25/2021 2318
6:2 FTS	15	11		1	75	64-140	07/25/2021 2318
4:2 FTS	15	16		1	107	63-143	07/25/2021 2318
GenX	32	30		1	94	70-150	07/25/2021 2318
ADONA	15	16		1	104	70-150	07/25/2021 2318
EtFOSAA	16	15		1	96	61-135	07/25/2021 2318
MeFOSAA	16	15		1	93	65-136	07/25/2021 2318
PFBS	14	15		1	105	72-130	07/25/2021 2318
PFDS	15	19		1	121	53-142	07/25/2021 2318
PFHpS	15	16		1	104	69-134	07/25/2021 2318
PFNS	15	16		1	101	69-127	07/25/2021 2318
PFOSA	16	16		1	101	67-137	07/25/2021 2318
PFPeS	15	16		1	105	71-127	07/25/2021 2318
PFHxS	15	15		1	101	68-131	07/25/2021 2318
PFBA	16	17		1	105	73-129	07/25/2021 2318
PFDA	16	17		1	109	71-129	07/25/2021 2318
PFDoA	16	18		1	110	72-134	07/25/2021 2318
PFHpA	16	19		1	119	72-130	07/25/2021 2318
PFHxA	16	18		1	113	72-129	07/25/2021 2318
PFNA	16	17		1	105	69-130	07/25/2021 2318
PFOA	16	17		1	108	71-133	07/25/2021 2318
PFPeA	16	16		1	102	72-129	07/25/2021 2318
PFTeDA	16	16		1	102	71-132	07/25/2021 2318
PFTrDA	16	20		1	122	65-144	07/25/2021 2318
PFUdA	16	14		1	90	69-133	07/25/2021 2318
PFOS	15	14		1	94	65-140	07/25/2021 2318

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		89	50-150
13C2_8:2FTS		75	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		73	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ99902-002
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	50-150
13C7_PFUdA		80	50-150
13C8_PFOA		87	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-001MS AOPC18-11E02A-071221 Matrix: Aqueous
Batch: 99902 Prep Method: SOP SPE
Analytical Method: PFAS by ID SOP QSM B-15 Prep Date: 07/23/2021 1742

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	14		1	100	70-150	07/26/2021 1547
11Cl-PF3OUdS	ND	14	12		1	90	70-150	07/26/2021 1547
8:2 FTS	ND	14	17		1	121	67-138	07/26/2021 1547
6:2 FTS	47	14	63		1	110	64-140	07/26/2021 1547
4:2 FTS	ND	14	14		1	102	63-143	07/26/2021 1547
GenX	ND	29	32		1	110	70-150	07/26/2021 1547
ADONA	ND	14	16		1	113	70-150	07/26/2021 1547
EtFOSAA	ND	15	15		1	100	61-135	07/26/2021 1547
MeFOSAA	ND	15	15		1	104	65-136	07/26/2021 1547
PFBS	18	13	33		1	109	72-130	07/26/2021 1547
PFDS	ND	14	14		1	103	53-142	07/26/2021 1547
PFHpS	4.2	14	19		1	107	69-134	07/26/2021 1547
PFNS	ND	14	15		1	107	69-127	07/26/2021 1547
PFOSA	ND	15	14		1	96	67-137	07/26/2021 1547
PFPeS	12	14	23		1	79	71-127	07/26/2021 1547
PFHxS	120	13	130		1	101	68-131	07/26/2021 1547
PFBA	73	15	94	N	1	148	73-129	07/26/2021 1547
PFDA	ND	15	15		1	102	71-129	07/26/2021 1547
PFDoA	ND	15	16		1	108	72-134	07/26/2021 1547
PFHpA	42	15	57		1	101	72-130	07/26/2021 1547
PFHxA	240	15	260	N	1	152	72-129	07/26/2021 1547
PFNA	2.9	15	21		1	121	69-130	07/26/2021 1547
PFOA	34	15	51		1	117	71-133	07/26/2021 1547
PFPeA	230	15	260	N	1	249	72-129	07/26/2021 1547
PFTeDA	ND	15	16		1	112	71-132	07/26/2021 1547
PFTrDA	ND	15	16		1	111	65-144	07/26/2021 1547
PFUdA	ND	15	18		1	124	69-133	07/26/2021 1547
PFOS	470	14	470	N	1	47	65-140	07/26/2021 1547

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		111	50-150
13C2_6:2FTS		133	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		95	50-150

NO ACTION
SAMPLE AMOUNTS > 4X AMOUNT SPIKED

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG20004-001MS
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		98	50-150
13C7_PFUdA		79	50-150
13C8_PFOA		109	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		109	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG20004-002DU AOPC18-WNB-7-071221 Matrix: Aqueous
Batch: 99902 Prep Method: SOP SPE
Analytical Method: PFAS by ID SOP QSM B-15 Prep Date: 07/23/2021 1742

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	07/26/2021 1608
11Cl-PF3OUdS	ND	ND		1	0.00	20	07/26/2021 1608
8:2 FTS	ND	ND		1	0.00	20	07/26/2021 1608
6:2 FTS	58	62		1	6.5	20	07/26/2021 1608
4:2 FTS	ND	ND		1	0.00	20	07/26/2021 1608
GenX	ND	ND		1	0.00	20	07/26/2021 1608
ADONA	ND	ND		1	0.00	20	07/26/2021 1608
EtFOSAA	ND	ND		1	0.00	20	07/26/2021 1608
MeFOSAA	ND	ND		1	0.00	20	07/26/2021 1608
PFBS	12	11		1	15	20	07/26/2021 1608
PFDS	ND	ND		1	0.00	20	07/26/2021 1608
PFHpS	ND	ND		1	0.00	20	07/26/2021 1608
PFNS	ND	ND		1	0.00	20	07/26/2021 1608
PFOSA	ND	ND		1	0.00	20	07/26/2021 1608
PFPeS	8.3	8.1		1	2.0	20	07/26/2021 1608
PFHxS	32	37		1	15	20	07/26/2021 1608
PFBA	12	11		1	9.3	20	07/26/2021 1608
PFDA	ND	ND		1	0.00	20	07/26/2021 1608
PFDoA	ND	ND		1	0.00	20	07/26/2021 1608
PFHpA	ND	ND		1	0.00	20	07/26/2021 1608
PFHxA	2.2	2.0	J	1	6.6	20	07/26/2021 1608
PFNA	ND	ND		1	0.00	20	07/26/2021 1608
PFOA	1.6	2.1	+	1	25	20	07/26/2021 1608
PFPeA	1.8	1.8	J	1	1.7	20	07/26/2021 1608
PFTeDA	ND	ND		1	0.00	20	07/26/2021 1608
PFTrDA	ND	ND		1	0.00	20	07/26/2021 1608
PFUdA	ND	ND		1	0.00	20	07/26/2021 1608
PFOS	55	48		1	12	20	07/26/2021 1608

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		109	50-150
13C2_6:2FTS		137	50-150
13C2_8:2FTS		103	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA		80	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		96	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		87	50-150

NO ACTION, RESULTS BELOW LOQ

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG20004-002DU
Batch: 99902
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/23/2021 1742

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		94	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		107	50-150
13C8_PFOS		92	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072721-DOD.b\072721025.d		
Injection Date:	27-Jul-2021 14:51:04	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	15
Lab Sample ID:	WG20004-004	Lab Prep. Batch:	99902
Client ID:	AOPC8-W11-2-071221	Sample Group:	WG20004
Sample Info:	WG20004-004	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Final Conc.:	Amt * DF * CF	Matrix/Level:	Aqueous

Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0459791

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	239	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.714	1.708	0	741488	17	>100:1			1001.00	799.16	69.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.714	1.714	0/0	790174	17	8.8:1			1044.71	48.035		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.078	2.079	1	868134	13	>100:1			1001.00	899.45	81.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.078	2.079	0/-1	142545	12	6.5:1			164.84	7.5791		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.131	0	250173	13	80:1			1001.00	879.58	83.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.131	0/0	43697	17	13:1	Target = 3.72		126.98	5.8384		
298.9 > 99	44	2.131	2.131		12853	14	9.0:1	3.39 (1.86-5.59)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.485		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.407	1	392785	14	>100:1			5005.00	8555.42	152.2*	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.450	1	814587	15	>100:1			1001.00	962.39	87.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.450	0/-1	141643	12	17:1	Target = 15.32		181.78	8.3581		M
313 > 119	49	2.450	2.450		9650	12	34:1	14.67 (7.66-22.98)					M
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.571	2.572	0	654199	16	>100:1			5005.00	4605.80	78.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.572		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.837	2.837	1	734496	17	>100:1			1001.00	827.31	76.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.837	2.837	0/-1	112274	13	39:1	Target = 3.39		172.56	7.9340		M
363 > 169	47	2.837	2.837		32111	13	78:1	3.49 (1.69-5.09)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.855	2.846	0	206581	18	>100:1			1001.00	822.28	75.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.855	2.855	0/0	78819	25	90:1	Target = 3.46	0.56	340.91	15.675		
399 > 99	45	2.855	2.855		18793	21	75:1	4.19 (1.73-5.19)	0.39				M
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.872		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.227		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.198	3.189	1	292208	25	>100:1			5005.00	7879.60	122.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.198	3.196	1/0	124349	27	>100:1	Target = 1.41		1077.84	49.558		
427 > 81	64	3.198	3.196		86169	21	>100:1	1.44 (0.70-2.12)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.223	3.215	1	786014	20	>100:1			1001.00	920.29	80.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.223	3.221	1/0	1785506	34	>100:1	Target = 2.62	0.27	2332.56	107.25		
413 > 169	53	3.223	3.221		757706	36	>100:1	2.35 (1.31-3.93)	0.39				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.588	3.592	1	145948	18	>100:1			1001.00	683.84	60	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													J
499 > 80	54	3.462	3.592	-7/-8	13653	36	31:1	Target = 3.76		66.313	3.0490		M
499 > 99	54	3.482	3.592		2156	33		6.33 (1.88-5.64)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.795		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.922		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.223		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.379		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.595	3.592	1	729733	20	>100:1			1001.00	824.48	79.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.606		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.886	3.877	1	319331	20	>100:1			1001.00	796.48	71.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.877		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.931	3.929	1	123605	17	>100:1			5005.00	4328.53	65.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.914		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.939	3.929	1	570050	17	>100:1			1001.00	793.08	69.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.929		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.094	4.091	1	501705	17	>100:1			5005.00	2802.25	46.5*	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.091		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.235	4.232	1	459562	15	>100:1			1001.00	683.35	64.4	

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821026.d		
Injection Date:	28-Jul-2021 16:22:25	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	19
Lab Sample ID:	WG20004-022	Lab Prep. Batch:	10188
Client ID:	AOPC3-W19-2-071621	Sample Group:	WG20004
Sample Info:	WG20004-022	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Final Conc.:	Amt * DF * CF	Matrix/Level:	Aqueous

Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0372509

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	295	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.717	1.712	1	467385	17	>100:1			1001.00	847.64	85.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													J
212.9 > 168.9	46	1.717	1.712	1/0	17021	16	15:1			37.804	1.4082		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.087	2.088	0	442762	15	>100:1			1001.00	857.50	87.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.141	0	140893	13	>100:1			1001.00	811.75	78.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.141		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.487		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.416	-1	88631	16	>100:1			5005.00	4445.81	94	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.451	0	499314	15	>100:1			1001.00	827.96	79.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													J
313 > 269	49	2.432	2.451	-1/-1	16338	11	31:1	Target = 19.67		32.042	1.1936		M
313 > 119	49	2.441	2.451		1140	13	25:1	14.33 (9.83-29.50)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.548	2.567	-1	1013306	15	>100:1			5005.00	4757.96	85.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.575		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.808	2.827	-1	417477	15	>100:1			1001.00	860.80	86.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.827		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.817	2.846	-1	116312	16	>100:1			1001.00	837.49	79.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.817	2.846	-1/0	27215	26	>100:1	Target = 3.05	0.22	218.72	8.1475		
399 > 99	45	2.826	2.846		6309	31	38:1	4.31 (1.52-4.57)	0.20				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.864		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.213		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.158	3.187	-1	80070	22	>100:1			5005.00	5105.61	97.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													J
427 > 407	64	3.165	3.187	-1/0	2381	21	33:1	Target = 1.82		52.769	1.9657		
427 > 81	64	3.151	3.187		735	13	7.4:1	3.23 (0.91-2.73)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.185	3.213	-1	415761	20	>100:1			1001.00	840.32	88.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.185	3.207	-1/0	51940	26	42:1	Target = 2.88		131.71	4.9064		M
413 > 169	53	3.185	3.207		20172	32	98:1	2.57 (1.44-4.32)	0.20				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.558	3.584	-1	102583	20	>100:1			1001.00	736.55	70.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													J
499 > 80	54	3.558	3.584	-1/0	8826	34	4.7:1	Target = 3.41	4.53	61.160	2.2783		
499 > 99	54	3.550	3.584		1667	35	11:1	5.29 (1.70-5.12)	0.83				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.796		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.935		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.235		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.396		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.566	3.592	-1	504952	18	>100:1			1001.00	828.89	85.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.592		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.860	3.885	-1	231706	17	>100:1			1001.00	867.88	75.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.885		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.909	3.935	-1	75231	16				5005.00	4444.67	81.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.935		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.917	3.943	-1	450280	17	>100:1			1001.00	763.37	73.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.943		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.075	4.105	-1	594382	17	>100:1			5005.00	4452.82	86.7	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.114		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.231	4.255	-1	484118	14	>100:1			1001.00	737.00	78.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.255		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.231	4.255	-1	490282	16	>100:1			5005.00	4265.91	76.7	

Report Date: 25-Jul-2021 09:48:01 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch:	\\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b		
Method:	LCMSMS01_PFAS-ID.M	Version: V7	21-Apr-2021 14:28:49
Instrument:	LCMSMS01.i	Integrator:	picker
Cal Start Date:	22-Jul-2021 16:28:35	Cal End Date:	22-Jul-2021 18:03:42
Method Lock:	Unlocked	Lock Date:	
Calib Method:	PFAS-ID	No.Compounds:	66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35	072221016.d	ICal					Analytes	L-1	1.00		
2	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06	072221017.d	ICal					Analytes	L-2	1.00		
3	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38	072221018.d	ICal					Analytes	L-3	1.00		
4	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12	072221019.d	ICal					Analytes	L-4	1.00		
5	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44	072221020.d	ICal					Analytes	L-5	1.00		
6	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19	072221021.d	ICal					Analytes	L-6	1.00		
7	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51	072221022.d	ICal					Analytes	L-7	1.00		
8	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28	072221023.d	ICal					Analytes	L-8	1.00		
9	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04	072221024.d	ICal					Analytes	L-9	1.00		
10	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42	072221025.d	ICal					Analytes	L-10	1.00		
100	ID BLK C1	22-Jul-2021 18:14:21	072221026.d	InstBlk					Surrogates	Smp	0.1100		
11	ICV 500_SVLC-1577	22-Jul-2021 18:25:03	072221027.d	ICV					Analytes	ICV	1.00		
12	ISOMERS_SVLC-1562	22-Jul-2021 18:35:36	072221028.d	CheckStd					IsomerCheck	Smp	1.00		
13	ID IBLK A	22-Jul-2021 18:46:09	072221029.d	InstBlk					Surrogates	Smp	0.1100		
14	WG10017-020	22-Jul-2021 18:56:42	072221030.d	Client	AOPC26-W5-3-070821	Aqueous	10	99310	Surrogates	Smp	0.1100		
15	WG16047-007	22-Jul-2021 19:07:15	072221031.d	Client	OU2-RCVTW-071621	Aqueous	5	99449	Surrogates	Smp	0.1100		
16	WQ99569-001	22-Jul-2021 19:17:50	072221032.d	MBlk		Aqueous	1	99569	Surrogates	Smp	0.1100		
17	WQ99569-101	22-Jul-2021 19:28:26	072221033.d	MBlk		Aqueous	1	99569	Surrogates	Smp	0.1100		
18	WQ99569-201	22-Jul-2021 19:39:00	072221034.d	MBlk		Aqueous	1	99569	Surrogates	Smp	0.1100		
19	WQ99569-002	22-Jul-2021 19:49:35	072221035.d	LCS		Aqueous	1	99569	Analytes	100x PDS	0.2000		
20	WQ99569-102	22-Jul-2021 20:00:13	072221036.d	LCS		Aqueous	1	99569	Analytes	100x PDS	0.2000		
21	WQ99569-202	22-Jul-2021 20:10:53	072221037.d	LCS		Aqueous	1	99569	Analytes	100x PDS	0.2000		
22	Stacked LCS_21-1520	22-Jul-2021 20:21:24	072221038.d	LCS		Aqueous	1		Analytes	100x PDS	0.2000		TeDA EIS @ 77.3%; clear for use
23	CCV 1000_SVLC-1573	22-Jul-2021 20:31:57	072221039.d	CCV					Analytes	L-5	1.00		
100	CCB C1	22-Jul-2021 20:42:32	072221040.d	InstBlk					Surrogates	Smp	0.1100		

Report Date: 25-Jul-2021 09:48:01 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.321	3.288	4.138	4.137	3.727	3.671	3.337	3.480	3.690	3.810	3.659	2.808-4.645	0.30603	1.863
1 4:2 FTS	0.853	1.412	1.669	1.502	1.395	1.625	1.846	1.498	1.511	1.755	1.506	0.620-2.169	0.25803	0.697
15 PFHxA	18.557	15.829	15.562	14.692	15.325	17.499	16.990	17.248	16.985	15.608	16.429	11.883-18.766	1.14721	7.662
22 PFPeS	3.746	3.334	2.960	3.382	3.079	3.193	3.233	3.322	3.504	3.320	3.307	2.441-3.716	0.21265	1.539
28 GenX	0.871	0.833	0.776	0.772	0.799	0.732	0.728	0.806	0.738	0.726	0.778	0.656-0.941	0.04748	0.399
13 PFHpA	3.068	2.922	2.751	3.071	3.398	3.373	3.442	2.961	3.375	3.126	3.148	2.699-4.096	0.23299	1.699
14 PFHxS	2.926	3.405	3.429	3.261	3.461	3.408	3.429	3.352	3.276	3.261	3.320	2.815-4.106	0.21512	1.730
29 ADONA	2.310	2.436	3.294	2.588	2.531	2.494	2.531	2.426	2.375	2.432	2.541	1.429-3.632	0.36718	1.265
2 6:2 FTS	1.155	1.375	1.414	1.626	1.416	1.669	1.457	1.551	1.691	1.541	1.489	0.953-1.878	0.15432	0.708
20 PFOA	2.503	2.945	2.501	3.127	2.626	2.757	2.876	2.849	2.742	2.665	2.759	2.025-3.226	0.20024	1.313
12 PFHpS	3.678	4.415	3.526	3.215	3.738	3.239	3.394	3.365	3.669	3.502	3.574	2.716-4.759	0.34054	1.869
18 PFOS	3.197	4.346	4.230	3.674	3.760	3.686	3.838	4.082	4.322	3.923	3.905	2.749-4.770	0.33686	1.880
17 PFNA	5.255	5.083	4.792	4.705	4.821	5.027	4.843	4.728	4.491	4.697	4.844	4.184-5.457	0.21216	2.410
19 PFOSA	75.390	24.756	40.572	39.362	43.922	41.633	39.152	37.527	39.958	41.159	42.343	6.076-81.767	12.61508	21.961
16 PFNS	4.131	2.605	3.992	3.093	3.220	3.525	4.244	3.245	3.351	3.283	3.468	1.639-4.800	0.52682	1.610
3 8:2 FTS	Disabled	1.087	0.920	1.278	1.337	1.654	1.581	1.444	1.511	1.542	1.372	0.628-2.045	0.23632	0.668
10 PFDA	11.555	17.454	9.696	11.433	9.469	10.411	10.327	10.800	10.458	10.081	11.168	2.522-16.415	2.31557	4.734
6 N-MeFOSAA	1.058	1.409	1.233	1.486	1.424	1.493	1.504	1.465	1.427	1.446	1.394	0.993-1.854	0.14353	0.712
9 PFDS	3.649	3.205	3.762	3.092	3.783	3.312	3.163	3.349	3.136	3.215	3.366	2.927-4.638	0.28525	1.891
5 N-EtFOSAA	1.821	1.842	1.797	1.581	2.065	1.724	1.809	1.746	1.778	1.825	1.798	1.716-2.413	0.11610	1.032
25 PFUdA	13.785	9.546	10.529	13.385	10.254	9.559	10.088	9.803	10.638	10.369	10.795	5.713-14.794	1.51356	5.127
26 MeFOSA	0.699	1.058	1.195	0.934	1.057	1.068	1.136	1.088	1.103	1.139	1.047	0.625-1.488	0.14399	0.528
11 PFDoA	8.519	8.778	7.816	8.044	8.015	7.418	7.617	7.255	7.351	7.435	7.824	6.105-9.924	0.63665	4.007
4 10:2 FTS	1.910	1.850	2.054	2.316	2.453	2.276	2.364	2.328	2.414	2.379	2.234	1.773-3.132	0.22648	1.226
27 EtFOSA	1.304	0.917	0.918	1.015	1.068	1.020	1.100	1.038	1.107	1.132	1.061	0.730-1.405	0.11265	0.534
34 PFDOS	4.352	3.740	3.762	2.886	3.469	3.341	3.443	3.385	3.436	3.335	3.514	2.303-4.634	0.38855	1.734
24 PFTrDA	3.219	3.157	3.682	3.226	3.366	3.387	3.271	3.369	3.375	3.542	3.359	2.908-3.823	0.15244	1.683
23 PFTeDA	8.965	10.866	10.033	9.090	9.195	9.162	8.900	8.716	9.055	8.962	9.294	7.228-11.161	0.65558	4.597
35 PFHxDA	12.608	13.605	13.646	12.857	13.889	13.604	13.506	13.926	13.241	12.984	13.386	12.448-15.329	0.48009	6.944
36 PFODA	109.512	115.454	79.163	105.241	106.538	103.776	100.211	113.415	112.760	117.519	106.358	73.055-140.02(	11.16083	53.269

Report Date: 25-Jul-2021 09:48:01 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	950	1041	1029	876	998	880	903	986	804	810	Avg:A Wt:C2	928		RSD=9.3	
	102.4	112.2	111	94.4	107.5	94.9	97.3	106.3	86.6	87.3	Org:N Dep:R				
8 PFBA	1.146813	1.059173	1.042238	1.051551	0.909947	1.029134	1.006740	0.986184	0.990621	0.988340	Avg:A Wt:C2	1.021074		RSD=6.1	
	112.3	103.7	102.1	103	89.1	100.8	98.6	96.6	97	96.8	Org:N Dep:R				
D 50 13C5_PFPeA	923	1102	1079	974	1060	910	947	999	845	814	Avg:A Wt:C2	965		RSD=10.0	
	95.6	114.2	111.8	101	109.8	94.3	98.1	103.5	87.5	84.3	Org:N Dep:R				
21 PFPeA	1.197978	1.012791	1.056849	0.917932	0.899997	1.001852	0.992507	0.966523	0.933663	0.990988	Avg:A Wt:C2	0.997108		RSD=8.5	
	120.1	101.6	106	92.1	90.3	100.5	99.5	96.9	93.6	99.4	Org:N Dep:R				
D 44 13C3_PFBS	267	317	317	269	297	282	285	305	254	250	Avg:A Wt:C2	284		RSD=8.5	
	94	111.5	111.3	94.6	104.5	99.1	100.3	107.3	89.4	88	Org:N Dep:R				
7 PFBS	1.580666	1.398661	1.402926	1.488054	1.290474	1.322859	1.235271	1.272884	1.380991	1.396505	Avg:A Wt:C2	1.376929		RSD=7.5	
	114.8	101.6	101.9	108.1	93.7	96.1	89.7	92.4	100.3	101.4	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	2.029520	1.475642	1.742882	1.805585	1.758785	1.877358	1.930378	1.626018	1.635262	1.750316	Avg:A Wt:C2	1.763175		RSD=9.1	
	115.1	83.7	98.8	102.4	99.8	106.5	109.5	92.2	92.7	99.3	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	47.1942	54.8522	55.9664	42.7012	42.1506	42.1172	44.8436	49.2170	39.3464	40.7178	Avg:A Wt:C2	45.9107		RSD=12.7	
	102.8	119.5	121.9	93	91.8	91.7	97.7	107.2	85.7	88.7	Org:N Dep:R				
D 49 13C5_PFHxA	861	951	1000	826	864	832	818	865	728	719	Avg:A Wt:C2	846		RSD=10.2	
	101.7	112.4	118.2	97.6	102.1	98.3	96.6	102.2	86	84.9	Org:N Dep:R				
15 PFHxA	1.198144	0.986735	0.920777	0.895360	0.843057	0.942849	0.919120	0.985650	0.947218	0.936226	Avg:A Wt:C2	0.957513		RSD=9.9	
	125.1	103.1	96.2	93.5	88	98.5	96	102.9	98.9	97.8	Org:N Dep:R				
22 PFPeS	1.134294	1.086939	1.028873	1.093730	0.883939	0.983419	0.977044	1.001805	1.010647	1.011998	Avg:A Wt:C2	1.021269		RSD=6.9	
	111.1	106.4	100.7	107.1	86.6	96.3	95.7	98.1	99	99.1	Org:N Dep:R				
28 GenX	0.852201	0.853530	0.835546	0.795226	0.836315	0.743185	0.800094	0.773871	0.752296	0.762104	Avg:A Wt:C2	0.800437		RSD=5.2	
	106.5	106.6	104.4	99.3	104.5	92.8	100	96.7	94	95.2	Org:N Dep:R				
D 66 13C3_GenX	145	167	166	139	130	138	133	155	124	125	Avg:A Wt:C2	142		RSD=11.1	
	102.3	117.4	116.7	97.8	91.4	96.8	93.7	108.8	87	88	Org:N Dep:R				
13 PFHpA	0.954851	0.920540	0.820506	0.910998	0.795900	0.957770	0.900207	0.880841	0.854151	0.871575	Avg:A Wt:C2	0.886734		RSD=6.0	
	107.7	103.8	92.5	102.7	89.8	108	101.5	99.3	96.3	98.3	Org:N Dep:R				
D 47 13C4_PFHpA	882	956	1049	848	1038	812	871	903	770	748	Avg:A Wt:C2	888		RSD=11.5	
	99.4	107.7	118.2	95.6	116.9	91.5	98.1	101.7	86.7	84.3	Org:N Dep:R				
D 45 13C3_PFHxS	256	263	276	262	262	253	241	272	219	209	Avg:A Wt:C2	251		RSD=8.7	
	101.7	104.7	109.8	104.2	104.2	100.8	95.9	108.2	87.4	83.2	Org:N Dep:R				
14 PFHxS	1.213523	1.380104	1.177955	0.979047	1.077121	1.058400	1.092882	1.072833	1.070482	1.080769	Avg:A Wt:C2	1.120311		RSD=10.0	
	108.3	123.2	105.1	87.4	96.1	94.5	97.6	95.8	95.6	96.5	Org:N Dep:R				
29 ADONA	5.579970	5.588419	5.773344	4.866185	4.874659	4.889146	5.506762	4.979976	4.903456	5.194983	Avg:A Wt:C2	5.215690		RSD=6.9	
	107	107.1	110.7	93.3	93.5	93.7	105.6	95.5	94	99.6	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	39.5070	42.6430	44.2410	35.8804	35.8016	36.1596	35.4342	38.7242	30.3810	32.0692	Avg:A Wt:C2	37.0841		RSD=11.6	
	106.5	115	119.3	96.8	96.5	97.5	95.6	104.4	81.9	86.5	Org:N Dep:R				
2 6:2 FTS	4.091034	2.980045	2.437145	2.211402	2.036835	1.981750	1.774722	1.766019	2.022572	1.805377	Ln:A Wt:C2	1.878339	105	R^2=0.997	
	99.5	99.5	100.2	105.9	102.5	102.5	93.3	93.4	107.3	95.8	Org:N Dep:R			RSE=5.1	
D 53 13C8_PFOA	903	1013	930	810	991	800	823	901	697	673	Avg:A Wt:C2	854		RSD=13.4	
	105.7	118.6	108.9	94.8	116.1	93.7	96.4	105.5	81.6	78.8	Org:N Dep:R				
20 PFOA	0.985938	0.977420	1.052026	1.018179	0.790325	1.016598	0.948073	0.944526	0.999054	1.016250	Avg:A Wt:C2	0.974839		RSD=7.5	
	101.1	100.3	107.9	104.4	81.1	104.3	97.3	96.9	102.5	104.2	Org:N Dep:R				
12 PFHpS	1.138114	1.081066	1.026401	0.882795	0.941136	0.908291	0.909044	0.882044	0.922854	0.979797	Avg:A Wt:C2	0.967154		RSD=9.1	
	117.7	111.8	106.1	91.3	97.3	93.9	94	91.2	95.4	101.3	Org:N Dep:R				
D 54 13C8_PFOS	201	246	241	200	227	221	198	231	182	186	Avg:A Wt:C2	213		RSD=10.6	
	94.3	115	113	93.7	106.5	103.4	92.9	108.4	85.5	87.2	Org:N Dep:R				
18 PFOS	1.615397	1.222029	1.163891	1.127899	1.013758	1.035129	1.147065	1.060053	1.112581	1.125657	Ln:A Wt:C2	1.066137	22.9419	R^2=0.996	
	105.1	91.4	97.6	101.2	92.8	95.9	107.1	99.2	104.2	105.5	Org:N Dep:R			RSE=5.9	
D 56 13C9_PFNA	971	951	971	843	955	960	855	889	696	760	Avg:A Wt:C2	885		RSD=10.9	
	109.7	107.4	109.7	95.3	107.9	108.5	96.6	100.4	78.6	85.8	Org:N Dep:R				
17 PFNA	0.880468	0.906852	0.911943	0.794261	0.800623	0.782357	0.881177	0.833085	0.868302	0.826077	Avg:A Wt:C2	0.848514		RSD=5.6	
	103.8	106.9	107.5	93.6	94.4	92.2	103.8	98.2	102.3	97.4	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.050248	2.779960	2.809686	2.717631	2.436226	2.535250	2.768433	2.770505	2.975193	2.885626	Avg:A Wt:C2	2.772876		RSD=6.6	
	110	100.3	101.3	98	87.9	91.4	99.8	99.9	107.3	104.1	Org:N Dep:R				
D 55 13C8_PFOSA	409	449	474	382	392	406	400	419	342	335	Avg:A Wt:C2	401		RSD=10.7	
	102.1	112	118.3	95.3	97.7	101.3	99.9	104.5	85.2	83.7	Org:N Dep:R				
19 PFOSA	0.979673	0.984615	1.031199	0.994644	0.999436	1.007684	0.986103	0.907525	0.953988	1.038905	Avg:A Wt:C2	0.988377		RSD=3.8	
	99.1	99.6	104.3	100.6	101.1	102	99.8	91.8	96.5	105.1	Org:N Dep:R				
16 PFNS	0.980434	0.769781	1.031588	0.866133	0.766954	0.807540	1.049144	0.788487	0.844281	0.802401	Avg:A Wt:C2	0.870674		RSD=12.5	
	112.6	88.4	118.5	99.5	88.1	92.7	120.5	90.6	97	92.2	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	27.8110	32.3308	35.6072	29.1086	26.4296	28.9784	28.5850	30.4350	22.3080	23.9652	Avg:A Wt:C2	28.5559		RSD=13.5	
	97.4	113.2	124.7	101.9	92.6	101.5	100.1	106.6	78.1	83.9	Org:N Dep:R				
3 8:2 FTS	Disabled	1.484523	1.120144	1.591836	1.719264	1.623861	1.594461	1.479497	1.700315	1.625434	Avg:A Wt:C2	1.548815		RSD=11.6	
	Disabled	95.8	72.3	102.8	111	104.8	102.9	95.5	109.8	104.9	Org:N Dep:R				
D 51 13C6_PFDA	719	819	822	742	824	706	692	702	559	604	Avg:A Wt:C2	719		RSD=12.5	
	100	113.9	114.4	103.2	114.6	98.3	96.2	97.6	77.8	84	Org:N Dep:R				
10 PFDA	1.003998	1.029676	0.895466	0.858398	0.745678	0.886264	0.914353	0.945250	0.937233	0.860330	Avg:A Wt:C2	0.907664		RSD=8.8	
	110.6	113.4	98.7	94.6	82.2	97.6	100.7	104.1	103.3	94.8	Org:N Dep:R				
D 58 d3-MeFOSAA	181	191	199	167	172	169	176	201	165	168	Avg:A Wt:C2	179		RSD=7.6	
	101.3	106.5	111.2	93.1	96.3	94.6	98.5	112.4	92.2	93.9	Org:N Dep:R				
6 N-MeFOSAA	0.640302	0.763816	0.692958	0.760480	0.795089	0.786061	0.754875	0.730051	0.718919	0.724874	Avg:A Wt:C2	0.736743		RSD=6.3	
	86.9	103.7	94.1	103.2	107.9	106.7	102.5	99.1	97.6	98.4	Org:N Dep:R				
9 PFDS	1.154008	0.948948	0.889878	0.927011	0.836858	0.880502	0.930868	0.933472	0.886344	0.887976	Avg:A Wt:C2	0.927586		RSD=9.3	
	124.4	102.3	95.9	99.9	90.2	94.9	100.4	100.6	95.6	95.7	Org:N Dep:R				
D 52 13C7_PFUdA	696	769	788	677	741	635	644	674	557	543	Avg:A Wt:C2	673		RSD=12.2	
	103.5	114.4	117.2	100.7	110.3	94.3	95.8	100.2	82.8	80.8	Org:N Dep:R				
5 N-EtFOSAA	1.037323	1.079879	0.867912	0.838590	0.946677	0.919155	1.030310	0.979071	0.952913	0.938631	Avg:A Wt:C2	0.959046		RSD=7.9	
	108.2	112.6	90.5	87.4	98.7	95.8	107.4	102.1	99.4	97.9	Org:N Dep:R				
D 60 d5-EtFOSAA	171	177	198	164	166	163	151	160	133	137	Avg:A Wt:C2	162		RSD=11.6	
	105.5	109.1	122.2	101.3	102.5	100.6	93.3	98.7	82.4	84.4	Org:N Dep:R				
25 PFUdA	1.016106	0.876899	0.874664	1.022154	0.783580	0.893017	0.894509	0.839273	0.884614	0.898678	Avg:A Wt:C2	0.898349		RSD=8.1	
	113.1	97.6	97.4	113.8	87.2	99.4	99.6	93.4	98.5	100	Org:N Dep:R				
D 61 d7-MeFOSE	156	161	167	147	145	139	152	154	139	141	Avg:A Wt:C2	150		RSD=6.3	
	103.9	107.1	111.1	97.9	96.9	92.9	101.4	102.5	92.5	93.8	Org:N Dep:R				
32 MeFOSE	0.760372	1.209343	0.977559	0.869384	0.973337	0.912254	0.967018	0.985853	0.922259	0.921491	Avg:A Wt:C2	0.949887		RSD=11.9	
	80	127.3	102.9	91.5	102.5	96	101.8	103.8	97.1	97	Org:N Dep:R				
26 MeFOSA	0.876216	1.065571	1.086872	0.919038	1.003212	0.988993	1.069631	1.053974	1.111668	0.965690	Avg:A Wt:C2	1.014086		RSD=7.6	
	86.4	105.1	107.2	90.6	98.9	97.5	105.5	103.9	109.6	95.2	Org:N Dep:R				
D 57 d3-MeFOSA	54.3930	61.7040	69.0790	60.3740	60.7050	61.9170	59.5170	60.7900	48.9650	57.3380	Avg:A Wt:C2	59.4782		RSD=8.8	
	91.5	103.7	116.1	101.5	102.1	104.1	100.1	102.2	82.3	96.4	Org:N Dep:R				
31 11Cl-PF3OUDS	2.642467	2.270061	2.601265	2.486255	2.430307	2.248608	2.579621	2.421537	2.575656	2.564755	Avg:A Wt:C2	2.482053		RSD=5.6	
	106.5	91.5	104.8	100.2	97.9	90.6	103.9	97.6	103.8	103.3	Org:N Dep:R				
11 PFDoA	1.127561	0.978251	0.987515	1.038760	0.869028	0.934117	0.916309	0.912095	0.890305	0.891594	Avg:A Wt:C2	0.954553		RSD=8.4	
	118.1	102.5	103.5	108.8	91	97.9	96	95.6	93.3	93.4	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 62 d9-EtFOSE	146	151	152	142	135	140	140	162	134	132	Avg:A Wt:C2	143		RSD=6.6	
	101.9	105.3	106.1	98.7	94.5	97.3	97.7	113	93.4	92.1	Org:N Dep:R				
D 38 13C2_PFDoA	729	805	821	684	798	690	724	758	624	619	Avg:A Wt:C2	725		RSD=9.9	
	100.5	111	113.3	94.4	110.1	95.2	99.8	104.5	86	85.3	Org:N Dep:R				
4 10:2 FTS	2.426724	1.992820	1.961525	1.948776	2.262136	1.931901	2.144053	2.124346	2.349268	2.291521	Avg:A Wt:C2	2.143307		RSD=8.5	
	113.2	93	91.5	90.9	105.5	90.1	100	99.1	109.6	106.9	Org:N Dep:R				
33 EtFOSE	0.926756	0.844799	0.839146	0.764904	0.845000	0.780836	0.803994	0.757992	0.769115	0.812159	Avg:A Wt:C2	0.814470		RSD=6.3	
	113.8	103.7	103	93.9	103.7	95.9	98.7	93.1	94.4	99.7	Org:N Dep:R				
D 59 d5-EtFOSA	55.2900	63.7120	65.1060	56.3210	51.0360	53.8930	65.2340	59.0200	50.3220	54.5000	Avg:A Wt:C2	57.4434		RSD=9.7	
	96.3	110.9	113.3	98	88.8	93.8	113.6	102.7	87.6	94.9	Org:N Dep:R				
27 EtFOSA	1.358293	0.995260	0.986545	0.945402	1.121698	1.096803	0.866174	1.057157	1.047517	1.024664	Avg:A Wt:C2	1.049951		RSD=12.5	
	129.4	94.8	94	90	106.8	104.5	82.5	100.7	99.8	97.6	Org:N Dep:R				
34 PFDOS	0.958675	0.816395	0.869885	0.827601	0.817840	0.807037	0.894540	0.876747	0.894285	0.855082	Avg:A Wt:C2	0.861809		RSD=5.5	
	111.2	94.7	100.9	96	94.9	93.6	103.8	101.7	103.8	99.2	Org:N Dep:R				
24 PFTrDA	0.432147	0.378528	0.396174	0.389217	0.378403	0.401696	0.392792	0.408297	0.390939	0.414524	Avg:A Wt:C2	0.398272		RSD=4.2	
	108.5	95	99.5	97.7	95	100.9	98.6	102.5	98.2	104.1	Org:N Dep:R				
23 PFTeDA	0.927658	0.903478	0.850035	0.792872	0.720772	0.810338	0.803481	0.790766	0.775964	0.755555	Avg:A Wt:C2	0.813092		RSD=7.9	
	114.1	111.1	104.5	97.5	88.6	99.7	98.8	97.3	95.4	92.9	Org:N Dep:R				
D 42 13C2_PFTeDA	822	888	920	769	864	763	757	794	657	674	Avg:A Wt:C2	791		RSD=10.9	
	104	112.3	116.4	97.2	109.3	96.4	95.7	100.4	83.1	85.2	Org:N Dep:R				
35 PFHxDA	1.905047	1.693246	1.625163	1.480277	1.618115	1.609262	1.592655	1.492890	1.504416	1.556932	Avg:A Wt:C2	1.607800		RSD=7.7	
	118.5	105.3	101.1	92.1	100.6	100.1	99.1	92.9	93.6	96.8	Org:N Dep:R				
D 40 13C2_PFHxDA	431	461	472	416	383	392	383	449	352	334	Avg:A Wt:C2	407		RSD=11.4	
	105.7	113.2	116	102.1	94.1	96.3	94	110.2	86.4	81.9	Org:N Dep:R				
36 PFODA	1.230954	1.139357	1.155522	1.067024	1.206023	1.175109	1.201510	1.157251	1.227304	1.317428	Avg:A Wt:C2	1.187748		RSD=5.6	
	103.6	95.9	97.3	89.8	101.5	98.9	101.2	97.4	103.3	110.9	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	666581	745284	778057	688511	708463	648102	682214	670924	549041	567636	4.00
* 39 13C2_PFHxA	783044	932373	919191	782225	842604	859583	774741	866085	681533	696333	2.93
* 41 13C2_PFOA	907986	960441	1005225	822516	872798	847866	819629	876260	719647	730605	5.41
* 43 13C3_PFBA	909511	991323	1018602	870136	933046	835167	844857	915770	769676	784926	3.67
* 48 13C4_PFOS	234807	239606	252387	197038	216608	202921	211005	218690	179156	191479	5.08

13C2_PFDA ((|567636 - 666581| / (567636 + 666581)) / 2) * 100 = 4.01
13C2_PFHxA ((|696333 - 783044| / (696333 + 783044)) / 2) * 100 = 2.93
13C2_PFOA ((|730605 - 907986| / (730605 + 907986)) / 2) * 100 = 5.41
13C3_PFBA ((|784926 - 909511| / (784926 + 909511)) / 2) * 100 = 3.68
13C4_PFOS ((|191479 - 234807| / (191479 + 234807)) / 2) * 100 = 5.08

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	950390	1041161	1029443	876079	997866	880388	902879	986222	803630	810258	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	54496	110277	214585	460621	908005	1812074	4544820	9725960	11941390	16016213	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	922972	1101984	1079416	974464	1059542	909779	946666	998859	844615	813509	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	55285	111608	228156	447246	953585	1822928	4697864	9654204	11828789	16123551	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	267414	317199	316662	269037	297147	281833	285312	305059	254183	250392	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	18683	39219	78544	176951	338979	659155	1557774	3432613	4654585	6182232	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	4473	7560	18221	36006	69241	147701	404259	747459	901427	1331305	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	235971	274261	279832	213506	210753	210586	224218	246085	196732	203589	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	860865	951137	1000410	825717	864384	831703	818049	865011	728114	718849	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	783044	932373	919191	782225	842604	859583	774741	866085	681533	696333	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	51572	93852	184231	369657	728725	1568340	3759425	8525978	10345236	13460105	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	14226	32340	61121	138005	246375	519952	1307395	2866618	3614434	4753712	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	12384	28464	55393	110515	217113	408858	1064384	2392542	2790466	3810893	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	726589	833714	828695	694865	649017	687679	665162	772914	618211	625061	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	42114	88038	172164	386453	826040	1555833	3921306	7952483	9861805	13044212	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	882106	956373	1049133	848417	1037869	812216	871201	902828	769716	748313	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	255509	262968	275776	261757	261903	253350	240866	271798	219474	208898	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	14108	33026	59123	116604	256712	488025	1197733	2653504	3206971	4109022	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	67152	138434	299961	599940	1202640	2333645	6247305	12750418	15206440	20445575	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	197535	213215	221205	179402	179008	180798	177171	193621	151905	160346	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	7661	12047	20443	37610	69130	135866	298079	648315	873787	1097727	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	907986	960441	1005225	822516	872798	847866	819629	876260	719647	730605	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	903120	1012819	930191	809649	991369	800023	822974	900970	696627	673180	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	44521	98995	195717	412184	783504	1626603	3901197	8509896	10439518	13682377	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	13842	27064	53894	109993	234655	438140	1042239	2282303	2892307	3897064	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	201229	245511	241239	200063	227393	220723	198362	231281	182378	186054	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	15083	27842	52112	104702	213924	424053	1055758	2275179	2824511	3887077	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	234807	239606	252387	197038	216608	202921	211005	218690	179156	191479	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	971165	950828	971245	843131	954829	960112	855062	888521	696083	759834	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	42754	86226	177144	334833	764458	1502300	3767303	7402131	9066152	12553626	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	28603	63610	126343	253363	516310	1043072	2559048	5971931	7585684	10007484	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	409402	449069	474496	381972	391661	406095	400396	419164	341573	335466	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	20054	44216	97860	189963	391440	818431	1974159	3804017	4887849	6970346	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	9470	18143	47781	83175	167424	342226	998929	1750676	2217287	2866368	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	139055	161654	178036	145543	132148	144892	142925	152175	111540	119826	
3 8:2 FTS	Disabled	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	Disabled	4598	7642	22195	43531	90161	218317	431373	545063	746356	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	666581	745284	778057	688511	708463	648102	682214	670924	549041	567636	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	718667	818578	822058	741882	824029	706493	691532	701602	558988	603997	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	36077	84287	147225	318415	614460	1252278	3161521	6631896	7858528	10392733	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	907072	953305	995875	833000	862293	846681	881876	1005789	824966	840979	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	5808	14563	27604	63348	137120	266217	665706	1468554	1779252	2438414	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	11193	22459	41389	89392	183445	374701	890007	2081221	2337455	3185276	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	695971	769028	788120	677387	741490	634511	644207	674178	556901	543337	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	8860	19083	34358	68775	157181	299489	777981	1565364	1907754	2564622	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	854122	883571	989674	820127	830172	814577	755094	799413	667341	683075	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	35359	67436	137868	346197	581017	1133258	2881244	5658194	7389633	9765698	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	155871	160765	166793	146858	145483	139379	152142	153861	138826	140708	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	5926	19442	32610	63838	141604	254298	735620	1516844	1920503	2593223	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	2383	6575	15016	27743	60900	122471	318306	640711	816492	1107415	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	54393	61704	69079	60374	60705	61917	59517	60790	48965	57338	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	25045	52500	118226	234279	520582	935066	2410101	5275723	6637468	8990127	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	41082	78722	162213	355423	693572	1289042	3315371	6912677	8328230	11032454	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	146101	150888	152113	141555	135458	139555	140112	161978	133831	132021	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	728688	804722	821319	684322	798101	689979	723636	757890	623624	618693	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3253	6211	13466	27342	57635	107936	295407	623269	757812	1058795	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	6770	12747	25529	54138	114462	217939	563246	1227780	1543972	2144442	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	55290	63712	65106	56321	51036	53893	65234	59020	50322	54500	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3755	6341	12846	26623	57247	118220	282520	623934	790697	1116884	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	9337	19402	40627	80137	180020	344863	858823	1962861	2368181	3080009	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	15745	30461	65077	133175	302004	554324	1421192	3094443	3656987	5129262	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	38139	80235	156478	304751	622925	1236121	3039266	6276856	7652488	10184487	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	822264	888068	920421	768727	864247	762719	756525	793769	657461	673974	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41015	78070	153536	307623	620225	1262431	3047641	6701987	7943950	10389813	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	430593	461067	472371	415629	383301	392239	382712	448927	352028	333663	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	26502	52532	109167	221743	462270	921847	2299161	5195213	6480679	8791541	

Report Date: 25-Jul-2021 09:48:01 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221016.d	ICAL 50_SVLC-1545A	22-Jul-2021 16:28:35
2	072221017.d	ICAL 100_SVLC-1546	22-Jul-2021 16:39:06
3	072221018.d	ICAL 200_SVLC-1547	22-Jul-2021 16:49:38
4	072221019.d	ICAL 500_SVLC-1548	22-Jul-2021 17:00:12
5	072221020.d	ICAL 1000_SVLC-1549	22-Jul-2021 17:10:44
6	072221021.d	ICAL 2000_SVLC-1550	22-Jul-2021 17:21:19
7	072221022.d	ICAL 5000_SVLC-1551	22-Jul-2021 17:31:51
8	072221023.d	ICAL 10000_SVLC-1552	22-Jul-2021 17:42:28
9	072221024.d	ICAL 15000_SVLC-1553	22-Jul-2021 17:53:04
10	072221025.d	ICAL 20000_SVLC-1554	22-Jul-2021 18:03:42

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.700	1.705	1.700	1.700	1.705	1.706	1.706	1.700	1.706	1.706	1.703	0.192
8 PFBA	1.706	1.705	1.706	1.706	1.705	1.706	1.706	1.706	1.706	1.706	1.706	0.028
D 50 13C5_PFPeA	2.056	2.055	2.056	2.056	2.055	2.056	2.056	2.056	2.056	2.056	2.055	0.015
21 PFPeA	2.056	2.055	2.056	2.056	2.055	2.056	2.056	2.056	2.056	2.056	2.055	0.015
D 44 13C3_PFBS	2.108	2.107	2.108	2.108	2.107	2.108	2.108	2.108	2.108	2.108	2.108	0.023
7 PFBS	2.118	2.118	2.108	2.108	2.118	2.108	2.108	2.108	2.108	2.108	2.111	0.218
1 4:2 FTS	2.379	2.379	2.388	2.380	2.379	2.379	2.388	2.380	2.380	2.388	2.381	0.183
D 63 13C2_4:2 FTS_2	2.388	2.379	2.380	2.380	2.388	2.379	2.380	2.380	2.380	2.379	2.381	0.154
D 49 13C5_PFHxA	2.423	2.422	2.423	2.423	2.422	2.423	2.423	2.423	2.423	2.423	2.422	0.021
* 39 13C2_PFHxA	2.423	2.422	2.423	2.423	2.422	2.423	2.423	2.423	2.423	2.423	2.422	0.021
15 PFHxA	2.423	2.422	2.423	2.423	2.422	2.423	2.423	2.423	2.423	2.423	2.422	0.021
22 PFPeS	2.458	2.457	2.449	2.458	2.457	2.458	2.458	2.458	2.449	2.457	2.455	0.139
28 GenX	2.536	2.544	2.536	2.536	2.544	2.545	2.536	2.545	2.536	2.544	2.540	0.171
D 66 13C3_GenX	2.536	2.535	2.545	2.536	2.544	2.536	2.536	2.545	2.536	2.544	2.539	0.172
13 PFHpA	2.801	2.792	2.801	2.801	2.800	2.801	2.801	2.801	2.801	2.800	2.799	0.090
D 47 13C4_PFHpA	2.792	2.801	2.792	2.801	2.800	2.801	2.801	2.801	2.801	2.800	2.798	0.134
D 45 13C3_PFHxS	2.809	2.810	2.810	2.810	2.818	2.818	2.809	2.818	2.818	2.818	2.813	0.165
14 PFHxS	2.809	2.810	2.810	2.810	2.818	2.809	2.809	2.818	2.810	2.818	2.812	0.149
29 ADONA	2.836	2.836	2.836	2.836	2.844	2.836	2.836	2.836	2.836	2.844	2.837	0.120
D 64 13C2_6:2 FTS_2	3.145	3.151	3.145	3.151	3.145	3.151	3.151	3.147	3.151	3.151	3.148	0.102
2 6:2 FTS	3.145	3.151	3.145	3.151	3.152	3.151	3.151	3.153	3.151	3.151	3.150	0.098
* 41 13C2_PFOA	3.170	3.177	3.170	3.177	3.171	3.177	3.177	3.178	3.177	3.183	3.175	0.123
D 53 13C8_PFOA	3.170	3.171	3.177	3.177	3.177	3.177	3.177	3.172	3.177	3.183	3.175	0.114
20 PFOA	3.170	3.177	3.170	3.177	3.177	3.177	3.177	3.178	3.183	3.183	3.176	0.133
12 PFHpS	3.183	3.177	3.177	3.183	3.183	3.183	3.183	3.185	3.183	3.189	3.182	0.119
D 54 13C8_PFOS	3.536	3.536	3.536	3.536	3.537	3.536	3.543	3.545	3.543	3.543	3.539	0.103
18 PFOS	3.543	3.536	3.543	3.536	3.537	3.543	3.543	3.545	3.543	3.550	3.542	0.121
* 48 13C4_PFOS	3.529	3.536	3.536	3.543	3.537	3.543	3.536	3.545	3.543	3.550	3.540	0.165
D 56 13C9_PFNA	3.536	3.543	3.543	3.543	3.544	3.543	3.543	3.545	3.543	3.550	3.543	0.087
17 PFNA	3.543	3.543	3.543	3.543	3.544	3.543	3.543	3.552	3.550	3.550	3.545	0.096
30 9Cl-PF3ONS	3.735	3.742	3.735	3.742	3.742	3.741	3.741	3.744	3.748	3.748	3.741	0.113
D 55 13C8_PFOSA	3.848	3.855	3.848	3.855	3.848	3.855	3.855	3.850	3.856	3.855	3.852	0.096
19 PFOSA	3.848	3.855	3.855	3.855	3.856	3.855	3.855	3.850	3.856	3.855	3.854	0.073

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.863	3.863	3.878	3.870	3.871	3.870	3.870	3.873	3.878	3.878	3.871	0.146
D 65 13C2_8:2 FTS_2	3.870	3.870	3.870	3.870	3.871	3.878	3.870	3.873	3.878	3.878	3.872	0.090
3 8:2 FTS	Disabled	3.870	3.870	3.870	3.871	3.870	3.878	3.873	3.878	3.878	3.873	0.092
* 37 13C2_PFDA	3.878	3.878	3.878	3.878	3.878	3.878	3.885	3.880	3.886	3.885	3.880	0.092
D 51 13C6_PFDA	3.878	3.878	3.878	3.878	3.878	3.878	3.878	3.880	3.886	3.885	3.879	0.082
10 PFDA	3.878	3.878	3.878	3.878	3.878	3.878	3.878	3.880	3.886	3.885	3.879	0.082
D 58 d3-MeFOSAA	4.029	4.030	4.030	4.030	4.030	4.029	4.030	4.032	4.030	4.039	4.030	0.079
6 N-MeFOSAA	4.020	4.030	4.030	4.040	4.030	4.039	4.039	4.032	4.040	4.039	4.033	0.169
9 PFDS	4.159	4.159	4.159	4.159	4.159	4.159	4.167	4.168	4.167	4.167	4.162	0.109
D 52 13C7_PFUdA	4.175	4.175	4.175	4.175	4.176	4.175	4.183	4.185	4.184	4.183	4.178	0.102
5 N-EtFOSAA	4.175	4.184	4.183	4.184	4.184	4.191	4.192	4.193	4.192	4.191	4.186	0.136
D 60 d5-EtFOSAA	4.175	4.175	4.175	4.184	4.184	4.183	4.183	4.185	4.184	4.191	4.182	0.122
25 PFUdA	4.175	4.175	4.175	4.184	4.184	4.183	4.183	4.185	4.184	4.183	4.181	0.094
D 61 d7-MeFOSE	4.282	4.282	4.282	4.282	4.283	4.282	4.282	4.283	4.282	4.282	4.282	0.011
32 MeFOSE	4.282	4.292	4.291	4.292	4.292	4.291	4.291	4.293	4.292	4.291	4.290	0.068
26 MeFOSA	4.301	4.301	4.301	4.301	4.301	4.301	4.301	4.302	4.301	4.301	4.300	0.016
D 57 d3-MeFOSA	4.301	4.301	4.301	4.301	4.301	4.301	4.301	4.302	4.301	4.301	4.300	0.016
31 11Cl-PF3OUDS	4.310	4.310	4.319	4.319	4.320	4.319	4.319	4.321	4.320	4.319	4.317	0.094
11 PFDoA	4.436	4.436	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.449	4.442	0.091
D 62 d9-EtFOSE	4.443	4.442	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.442	0.011
D 38 13C2_PFDoA	4.436	4.436	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.443	4.441	0.071
4 10:2 FTS	4.450	4.449	4.450	4.450	4.449	4.450	4.450	4.457	4.457	4.456	4.451	0.080
33 EtFOSE	4.450	4.449	4.456	4.450	4.456	4.456	4.457	4.457	4.457	4.456	4.454	0.078
D 59 d5-EtFOSA	4.456	4.464	4.465	4.457	4.464	4.465	4.465	4.465	4.465	4.464	4.463	0.077
27 EtFOSA	4.456	4.472	4.473	4.473	4.473	4.473	4.473	4.473	4.473	4.473	4.471	0.116
34 PFDOS	4.639	4.646	4.647	4.647	4.646	4.654	4.654	4.655	4.655	4.654	4.649	0.120
24 PFTrDA	4.669	4.669	4.670	4.670	4.677	4.677	4.677	4.678	4.677	4.677	4.674	0.085
23 PFTeDA	4.880	4.880	4.881	4.889	4.889	4.889	4.889	4.890	4.889	4.889	4.886	0.088
D 42 13C2_PFTeDA	4.880	4.880	4.881	4.881	4.889	4.889	4.889	4.890	4.889	4.889	4.885	0.094
35 PFHxDA	5.245	5.253	5.253	5.253	5.253	5.253	5.253	5.256	5.262	5.262	5.254	0.095
D 40 13C2_PFHxDA	5.245	5.244	5.245	5.245	5.253	5.253	5.253	5.256	5.254	5.253	5.250	0.091
36 PFODA	5.577	5.577	5.577	5.584	5.584	5.584	5.584	5.587	5.592	5.591	5.583	0.100

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221027.d
Injection Date: 22-Jul-2021 18:25:03 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1577 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	434.90	87	70 - 130
D 46 13C4_PFBA	997866	1043858			104.6	50 - 150
D 50 13C5_PFPeA	1059542	1138873			107.5	50 - 150
21 PFPeA			500.00	417.42	83.5	70 - 130
D 44 13C3_PFBS	297147	333161			112.1	50 - 150
7 PFBS			442.50	347.02	78.4	70 - 130
1 4:2 FTS			467.50	436.57	93.4	70 - 130
D 63 13C2_4:2 FTS_2	210753	235252			111.6	50 - 150
D 49 13C5_PFHxA	864384	977773			113.1	50 - 150
15 PFHxA			500.00	397.81	79.6	70 - 130
22 PFPeS			470.00	391.57	83.3	70 - 130
28 GenX			2500.00	2236.47	89.5	70 - 130
D 66 13C3_GenX	649017	753194			116.1	50 - 150
D 47 13C4_PFHpA	1037869	1016453			97.9	50 - 150
13 PFHpA			500.00	419.55	83.9	70 - 130
D 45 13C3_PFHxS	261903	274511			104.8	50 - 150
14 PFHxS			456.00	386.30	84.7	70 - 130
29 ADONA			2355.00	2486.63	105.6	70 - 130
D 64 13C2_6:2 FTS_2	179008	198935			111.1	50 - 150
2 6:2 FTS			475.00	391.15	82.3	70 - 130
20 PFOA			500.00	444.49	88.9	70 - 130
D 53 13C8_PFOA	991369	1004348			101.3	50 - 150
12 PFHpS			475.00	411.84	86.7	70 - 130
18 PFOS			462.75	377.80	81.6	70 - 130
D 54 13C8_PFOS	227393	251056			110.4	50 - 150
17 PFNA			500.00	428.11	85.6	70 - 130
D 56 13C9_PFNA	954829	983209			103	50 - 150
30 9Cl-PF3ONS			2330.00	1867.02	80.1	70 - 130
D 55 13C8_PFOSA	391661	421050			107.5	50 - 150
19 PFOSA			500.00	457.72	91.5	70 - 130
16 PFNS			480.00	381.25	79.4	70 - 130
D 65 13C2_8:2 FTS_2	132148	130382			98.7	50 - 150
3 8:2 FTS			480.00	573.22	119.4	70 - 130
10 PFDA			500.00	369.04	73.8	70 - 130
D 51 13C6_PFDA	824029	880227			106.8	50 - 150
6 N-MeFOSAA			500.00	521.15	104.2	70 - 130

Report Date: 25-Jul-2021 09:47:46 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\organics\LL\LCMSMS01.i\072221-DOD+ICAL.b\072221027.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	862293	952420			110.5	50 - 150
9 PFDS			482.50	401.17	83.1	70 - 130
D 52 13C7_PFUdA	741490	718388			96.9	50 - 150
5 N-EtFOSAA			500.00	522.12	104.4	70 - 130
25 PFUdA			500.00	459.64	91.9	70 - 130
D 60 d5-EtFOSAA	830172	880794			106.1	50 - 150
D 61 d7-MeFOSE	145483	156107			107.3	50 - 150
D 57 d3-MeFOSA	60705	56017			92.3	50 - 150
31 11Cl-PF3OUDS			2355.00	1812.85	77	70 - 130
D 62 d9-EtFOSE	135458	150921			111.4	50 - 150
11 PFDoA			500.00	430.33	86.1	70 - 130
D 38 13C2_PFDoA	798101	837870			105	50 - 150
4 10:2 FTS			2410.00	3015.65	125.1	70 - 130
D 59 d5-EtFOSA	51036	64539			126.5	50 - 150
24 PFTrDA			500.00	407.06	81.4	70 - 130
23 PFTeDA			500.00	422.33	84.5	70 - 130
D 42 13C2_PFTeDA	864247	905318			104.8	50 - 150
D 40 13C2_PFHxDA	383301	446402			116.5	50 - 150

Report Date: 28-Jul-2021 06:40:34 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\072521-DOD.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	CCV 100_SVLC-1546	25-Jul-2021 12:22:57	072521005.d	CCV					Analytes	L-2	1.00		
96	CCV 200_SVLC-1547	25-Jul-2021 12:33:30	072521006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	25-Jul-2021 12:44:01	072521007.d	InstBlk					Surrogates	Smp	0.1100		
51	ID CCV 1000C_SVLC-1573	25-Jul-2021 22:25:58	072521062.d	CCV					Analytes	L-5	1.00		
100	CCB C4	25-Jul-2021 22:36:32	072521063.d	InstBlk					Surrogates	Smp	0.1100		
52	WG12034-001	25-Jul-2021 22:47:14	072521064.d	Client	GMW-01	Aqueous	100	99698	Surrogates	Smp	0.1100		RR-200X
53	WG12034-002	25-Jul-2021 22:57:48	072521065.d	Client	GMW-02	Aqueous	1	99698	Surrogates	Smp	0.1100		RR-1X-C/O
54	WQ99902-001	25-Jul-2021 23:08:22	072521066.d	MBlk		Aqueous	1	99902	Surrogates	Smp	0.1100		
55	WQ99902-002	25-Jul-2021 23:18:56	072521067.d	LCS		Aqueous	1	99902	Analytes	100x PDS	0.2000		
56	WG16047-007	25-Jul-2021 23:29:32	072521068.d	Client	OU2-RCVTW-071621	Aqueous	1	99902	Surrogates	Smp	0.1100		OK @1X, RX FOR TeDA/LCS ONLY
94	ID BLK B3	25-Jul-2021 23:40:10	072521069.d	InstBlk					Surrogates	Smp	0.1100		
57	CCV 1000D_SVLC-1573	25-Jul-2021 23:50:40	072521070.d	CCV					Analytes	L-5	1.00		
100	CCB C5	26-Jul-2021 00:01:18	072521071.d	InstBlk					Surrogates	Smp	0.1100		

NO SAMPLES ASSOCIATED

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File:	\\Organics\LL\LCMSMS01.i\072521-DOD.b\072521005.d		
Injection Date:	25-Jul-2021 12:22:57	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	95
Sample Info:	CCV 100_SVLC-1546	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	110.22	110.2	70 - 130
D 46 13C4_PFBA	997866	895016			89.7	50 - 150
D 50 13C5_PFPeA	1059542	915140			86.4	50 - 150
21 PFPeA			100.00	104.59	104.6	70 - 130
D 44 13C3_PFBS	297147	285750			96.2	50 - 150
7 PFBS			88.400	85.476	96.7	70 - 130
1 4:2 FTS			93.400	88.825	95.1	70 - 130
D 63 13C2_4:2 FTS_2	210753	177921			84.4	50 - 150
D 49 13C5_PFHxA	864384	789993			91.4	50 - 150
15 PFHxA			100.00	108.26	108.3	70 - 130
22 PFPeS			93.800	97.355	103.8	70 - 130
28 GenX			200.00	177.96	89	70 - 130
D 66 13C3_GenX	649017	905272			139.5	50 - 150
D 47 13C4_PFHpA	1037869	850037			81.9	50 - 150
13 PFHpA			100.00	109.95	110	70 - 130
D 45 13C3_PFHxS	261903	251509			96	50 - 150
14 PFHxS			91.000	92.920	102.1	70 - 130
29 ADONA			94.200	103.15	109.5	70 - 130
D 64 13C2_6:2 FTS_2	179008	175345			98	50 - 150
2 6:2 FTS			94.800	122.79	129.5	70 - 130
20 PFOA			100.00	110.04	110	70 - 130
D 53 13C8_PFOA	991369	794632			80.2	50 - 150
12 PFHpS			95.200	98.583	103.6	70 - 130
18 PFOS			92.800	78.637	84.7	70 - 130
D 54 13C8_PFOS	227393	216951			95.4	50 - 150
17 PFNA			100.00	106.94	106.9	70 - 130
D 56 13C9_PFNA	954829	849072			88.9	50 - 150
30 9Cl-PF3ONS			93.200	97.740	104.9	70 - 130
D 55 13C8_PFOSA	391661	444832			113.6	50 - 150
19 PFOSA			100.00	111.08	111.1	70 - 130
16 PFNS			96.000	117.46	122.4	70 - 130
D 65 13C2_8:2 FTS_2	132148	169362			128.2	50 - 150
3 8:2 FTS			95.800	100.47	104.9	70 - 130
10 PFDA			100.00	100.24	100.2	70 - 130
D 51 13C6_PFDA	824029	751551			91.2	50 - 150
6 N-MeFOSAA			100.00	105.39	105.4	70 - 130

Report Date: 28-Jul-2021 06:40:16 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\ORGANICS\LL\LCMSMS01.i\072521-DOD.b\072521005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	862293	992885			115.1	50 - 150
9 PFDS			96.400	107.83	111.9	70 - 130
D 52 13C7_PFUdA	741490	742712			100.2	50 - 150
5 N-EtFOSAA			100.00	90.581	90.6	70 - 130
25 PFUdA			100.00	94.664	94.7	70 - 130
D 60 d5-EtFOSAA	830172	908700			109.5	50 - 150
D 61 d7-MeFOSE	145483	176961			121.6	50 - 150
32 MeFOSE			100.00	108.26	108.3	70 - 130
26 MeFOSA			100.00	132.34	132.3	70 - 130
D 57 d3-MeFOSA	60705	68029			112.1	50 - 150
31 11Cl-PF3OUDS			94.200	96.957	102.9	70 - 130
D 62 d9-EtFOSE	135458	178927			132.1	50 - 150
11 PFDoA			100.00	111.29	111.3	70 - 130
D 38 13C2_PFDoA	798101	749501			93.9	50 - 150
4 10:2 FTS			96.400	81.062	84.1	70 - 130
33 EtFOSE			100.00	96.816	96.8	70 - 130
D 59 d5-EtFOSA	51036	60082			117.7	50 - 150
27 EtFOSA			100.00	82.891	82.9	70 - 130
34 PFDOS			96.800	98.481	101.7	70 - 130
24 PFTrDA			100.00	110.52	110.5	70 - 130
23 PFTeDA			100.00	97.147	97.1	70 - 130
D 42 13C2_PFTeDA	864247	909223			105.2	50 - 150
35 PFHxDA			100.00	100.73	100.7	70 - 130
D 40 13C2_PFHxDA	383301	572782			149.4	50 - 150
36 PFODA			100.00	100.75	100.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072521-DOD.b\072521006.d
Injection Date: 25-Jul-2021 12:33:30 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	204.95	102.5	70 - 130
D 46 13C4_PFBA	895016	884161			98.8	50 - 150
D 50 13C5_PFPeA	915140	866382			94.7	50 - 150
21 PFPeA			200.00	206.40	103.2	70 - 130
D 44 13C3_PFBS	285750	294543			103.1	50 - 150
7 PFBS			176.80	164.63	93.1	70 - 130
1 4:2 FTS			186.80	207.85	111.3	70 - 130
D 63 13C2_4:2 FTS_2	177921	175292			98.5	50 - 150
D 49 13C5_PFHxA	789993	784610			99.3	50 - 150
15 PFHxA			200.00	207.43	103.7	70 - 130
22 PFPeS			187.60	178.65	95.2	70 - 130
28 GenX			400.00	361.38	90.3	70 - 130
D 66 13C3_GenX	905272	870799			96.2	50 - 150
D 47 13C4_PFHpA	850037	799006			94	50 - 150
13 PFHpA			200.00	241.26	120.6	70 - 130
D 45 13C3_PFHxS	251509	236898			94.2	50 - 150
14 PFHxS			182.00	195.05	107.2	70 - 130
29 ADONA			188.40	196.95	104.5	70 - 130
D 64 13C2_6:2 FTS_2	175345	160838			91.7	50 - 150
2 6:2 FTS			189.60	193.43	102	70 - 130
20 PFOA			200.00	218.52	109.3	70 - 130
D 53 13C8_PFOA	794632	834065			105	50 - 150
12 PFHpS			190.40	205.70	108	70 - 130
18 PFOS			185.60	172.66	93	70 - 130
D 54 13C8_PFOS	216951	209036			96.4	50 - 150
17 PFNA			200.00	225.69	112.8	70 - 130
D 56 13C9_PFNA	849072	766098			90.2	50 - 150
30 9Cl-PF3ONS			186.40	201.66	108.2	70 - 130
D 55 13C8_PFOSA	444832	414408			93.2	50 - 150
19 PFOSA			200.00	227.00	113.5	70 - 130
16 PFNS			192.00	204.74	106.6	70 - 130
D 65 13C2_8:2 FTS_2	169362	148250			87.5	50 - 150
3 8:2 FTS			191.60	196.35	102.5	70 - 130
10 PFDA			200.00	206.90	103.4	70 - 130
D 51 13C6_PFDA	751551	771494			102.7	50 - 150
6 N-MeFOSAA			200.00	206.59	103.3	70 - 130

Report Date: 28-Jul-2021 06:40:18 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\ORGANICS\LL\LCMSMS01.i\072521-DOD.b\072521006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	992885	936428			94.3	50 - 150
9 PFDS			192.80	213.94	111	70 - 130
D 52 13C7_PFUdA	742712	724741			97.6	50 - 150
5 N-EtFOSAA			200.00	181.47	90.7	70 - 130
25 PFUdA			200.00	198.97	99.5	70 - 130
D 60 d5-EtFOSAA	908700	900195			99.1	50 - 150
D 61 d7-MeFOSE	176961	206661			116.8	50 - 150
32 MeFOSE			200.00	173.12	86.6	70 - 130
26 MeFOSA			200.00	244.86	122.4	70 - 130
D 57 d3-MeFOSA	68029	57078			83.9	50 - 150
31 11Cl-PF3OUDS			188.40	225.76	119.8	70 - 130
D 62 d9-EtFOSE	178927	176889			98.9	50 - 150
11 PFDoA			200.00	189.55	94.8	70 - 130
D 38 13C2_PFDoA	749501	811153			108.2	50 - 150
4 10:2 FTS			192.80	225.53	117	70 - 130
33 EtFOSE			200.00	190.08	95	70 - 130
D 59 d5-EtFOSA	60082	53777			89.5	50 - 150
27 EtFOSA			200.00	211.36	105.7	70 - 130
34 PFDOS			193.60	220.74	114	70 - 130
24 PFTrDA			200.00	215.53	107.8	70 - 130
23 PFTeDA			200.00	201.80	100.9	70 - 130
D 42 13C2_PFTeDA	909223	889333			97.8	50 - 150
35 PFHxDA			200.00	187.09	93.5	70 - 130
D 40 13C2_PFHxDA	572782	573355			100.1	50 - 150
36 PFODA			200.00	195.47	97.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File:	\\Organics\LL\LCMSMS01.i\072521-DOD.b\072521062.d		
Injection Date:	25-Jul-2021 22:25:58	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	51
Sample Info:	ID CCV 1000C_SVLC-1573	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	907.15	90.7	70 - 130
D 46 13C4_PFBA	895016	746815			83.4	50 - 150
D 50 13C5_PFPeA	915140	765628			83.7	50 - 150
21 PFPeA			1000.00	884.69	88.5	70 - 130
D 44 13C3_PFBS	285750	233198			81.6	50 - 150
7 PFBS			884.00	839.33	94.9	70 - 130
1 4:2 FTS			934.00	938.72	100.5	70 - 130
D 63 13C2_4:2 FTS_2	177921	133905			75.3	50 - 150
D 49 13C5_PFHxA	789993	652431			82.6	50 - 150
15 PFHxA			1000.00	931.35	93.1	70 - 130
22 PFPeS			938.00	839.47	89.5	70 - 130
28 GenX			2000.00	1702.38	85.1	70 - 130
D 66 13C3_GenX	905272	690672			76.3	50 - 150
D 47 13C4_PFHpA	850037	663454			78.1	50 - 150
13 PFHpA			1000.00	1042.82	104.3	70 - 130
D 45 13C3_PFHxS	251509	215307			85.6	50 - 150
14 PFHxS			910.00	844.85	92.8	70 - 130
29 ADONA			942.00	774.70	82.2	70 - 130
D 64 13C2_6:2 FTS_2	175345	123559			70.5	50 - 150
2 6:2 FTS			948.00	968.59	102.2	70 - 130
20 PFOA			1000.00	898.36	89.8	70 - 130
D 53 13C8_PFOA	794632	706080			88.9	50 - 150
12 PFHpS			952.00	850.68	89.4	70 - 130
18 PFOS			928.00	815.67	87.9	70 - 130
D 54 13C8_PFOS	216951	198592			91.5	50 - 150
17 PFNA			1000.00	983.26	98.3	70 - 130
D 56 13C9_PFNA	849072	693146			81.6	50 - 150
30 9Cl-PF3ONS			932.00	740.27	79.4	70 - 130
D 55 13C8_PFOSA	444832	339662			76.4	50 - 150
19 PFOSA			1000.00	1027.98	102.8	70 - 130
16 PFNS			960.00	842.81	87.8	70 - 130
D 65 13C2_8:2 FTS_2	169362	103653			61.2	50 - 150
3 8:2 FTS			958.00	1136.08	118.6	70 - 130
10 PFDA			1000.00	902.89	90.3	70 - 130
D 51 13C6_PFDA	751551	634402			84.4	50 - 150
6 N-MeFOSAA			1000.00	1069.72	107	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	992885	715800			72.1	50 - 150
9 PFDS			964.00	776.86	80.6	70 - 130
D 52 13C7_PFUdA	742712	600699			80.9	50 - 150
5 N-EtFOSAA			1000.00	973.06	97.3	70 - 130
25 PFUdA			1000.00	840.39	84	70 - 130
D 60 d5-EtFOSAA	908700	672895			74.1	50 - 150
D 61 d7-MeFOSE	176961	145848			82.4	50 - 150
32 MeFOSE			1000.00	889.84	89	70 - 130
26 MeFOSA			1000.00	1075.87	107.6	70 - 130
D 57 d3-MeFOSA	68029	43524			64	50 - 150
31 11Cl-PF3OUDS			942.00	736.52	78.2	70 - 130
D 62 d9-EtFOSE	178927	129358			72.3	50 - 150
11 PFDoA			1000.00	966.52	96.7	70 - 130
D 38 13C2_PFDoA	749501	657686			87.7	50 - 150
4 10:2 FTS			964.00	1059.24	109.9	70 - 130
33 EtFOSE			1000.00	1035.51	103.6	70 - 130
D 59 d5-EtFOSA	60082	47587			79.2	50 - 150
27 EtFOSA			1000.00	1001.86	100.2	70 - 130
34 PFDOS			968.00	816.75	84.4	70 - 130
24 PFTrDA			1000.00	916.54	91.7	70 - 130
23 PFTeDA			1000.00	983.22	98.3	70 - 130
D 42 13C2_PFTeDA	909223	667404			73.4	50 - 150
35 PFHxDA			1000.00	886.18	88.6	70 - 130
D 40 13C2_PFHxDA	572782	427932			74.7	50 - 150
36 PFODA			1000.00	1036.28	103.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File:	\\Organics\LL\LCMSMS01.i\072521-DOD.b\072521070.d		
Injection Date:	25-Jul-2021 23:50:40	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	57
Sample Info:	CCV 1000D_SVLC-1573	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	921.79	92.2	70 - 130
D 46 13C4_PFBA	895016	822268			91.9	50 - 150
D 50 13C5_PFPeA	915140	818187			89.4	50 - 150
21 PFPeA			1000.00	1044.37	104.4	70 - 130
D 44 13C3_PFBS	285750	262822			92	50 - 150
7 PFBS			884.00	774.93	87.7	70 - 130
1 4:2 FTS			934.00	764.35	81.8	70 - 130
D 63 13C2_4:2 FTS_2	177921	161827			91	50 - 150
D 49 13C5_PFHxA	789993	742590			94	50 - 150
15 PFHxA			1000.00	896.52	89.7	70 - 130
22 PFPeS			938.00	846.97	90.3	70 - 130
28 GenX			2000.00	1692.46	84.6	70 - 130
D 66 13C3_GenX	905272	805172			88.9	50 - 150
D 47 13C4_PFHpA	850037	777775			91.5	50 - 150
13 PFHpA			1000.00	925.35	92.5	70 - 130
D 45 13C3_PFHxS	251509	234611			93.3	50 - 150
14 PFHxS			910.00	834.87	91.7	70 - 130
29 ADONA			942.00	773.60	82.1	70 - 130
D 64 13C2_6:2 FTS_2	175345	137888			78.6	50 - 150
2 6:2 FTS			948.00	1008.50	106.4	70 - 130
20 PFOA			1000.00	883.26	88.3	70 - 130
D 53 13C8_PFOA	794632	787411			99.1	50 - 150
12 PFHpS			952.00	925.66	97.2	70 - 130
18 PFOS			928.00	868.49	93.6	70 - 130
D 54 13C8_PFOS	216951	207020			95.4	50 - 150
17 PFNA			1000.00	1033.78	103.4	70 - 130
D 56 13C9_PFNA	849072	791685			93.2	50 - 150
30 9Cl-PF3ONS			932.00	836.76	89.8	70 - 130
D 55 13C8_PFOSA	444832	375589			84.4	50 - 150
19 PFOSA			1000.00	925.02	92.5	70 - 130
16 PFNS			960.00	831.90	86.7	70 - 130
D 65 13C2_8:2 FTS_2	169362	125419			74.1	50 - 150
3 8:2 FTS			958.00	1097.73	114.6	70 - 130
10 PFDA			1000.00	1112.43	111.2	70 - 130
D 51 13C6_PFDA	751551	711976			94.7	50 - 150
6 N-MeFOSAA			1000.00	1036.02	103.6	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	992885	826744			83.3	50 - 150
9 PFDS			964.00	796.68	82.6	70 - 130
D 52 13C7_PFUdA	742712	679949			91.5	50 - 150
5 N-EtFOSAA			1000.00	1053.45	105.3	70 - 130
25 PFUdA			1000.00	896.24	89.6	70 - 130
D 60 d5-EtFOSAA	908700	720615			79.3	50 - 150
D 61 d7-MeFOSE	176961	157422			89	50 - 150
32 MeFOSE			1000.00	968.07	96.8	70 - 130
26 MeFOSA			1000.00	932.62	93.3	70 - 130
D 57 d3-MeFOSA	68029	48577			71.4	50 - 150
31 11Cl-PF3OUDS			942.00	797.85	84.7	70 - 130
D 62 d9-EtFOSE	178927	146320			81.8	50 - 150
11 PFDoA			1000.00	865.07	86.5	70 - 130
D 38 13C2_PFDoA	749501	752182			100.4	50 - 150
4 10:2 FTS			964.00	907.79	94.2	70 - 130
33 EtFOSE			1000.00	1000.48	100	70 - 130
D 59 d5-EtFOSA	60082	49961			83.2	50 - 150
27 EtFOSA			1000.00	1077.10	107.7	70 - 130
34 PFDOS			968.00	865.21	89.4	70 - 130
24 PFTrDA			1000.00	951.33	95.1	70 - 130
23 PFTeDA			1000.00	904.07	90.4	70 - 130
D 42 13C2_PFTeDA	909223	826305			90.9	50 - 150
35 PFHxDA			1000.00	936.12	93.6	70 - 130
D 40 13C2_PFHxDA	572782	473694			82.7	50 - 150
36 PFODA			1000.00	1022.24	102.2	70 - 130

Report Date: 27-Jul-2021 15:29:30 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\072621-DOD.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	CCV 100_SVLC-1546	26-Jul-2021 11:54:38	072621005.d	CCV					Analytes	L-2	1.00		
96	CCV 200_SVLC-1547	26-Jul-2021 12:05:12	072621006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	26-Jul-2021 12:15:44	072621007.d	InstBlk					Surrogates	Smp	0.1100		
11	CCV 1000_SVLC-1573	26-Jul-2021 14:22:47	072621019.d	CCV					Analytes	L-5	1.00		
15	WG12034-001	26-Jul-2021 15:04:59	072621023.d	Client	GMW-01	Aqueous	200	99698	Surrogates	Smp	0.1100		RR-200X, 8:2 CCV
16	WG12034-002	26-Jul-2021 15:15:33	072621024.d	Client	GMW-02	Aqueous	1	99698	Surrogates	Smp	0.1100		
17	WG20002-029	26-Jul-2021 15:26:08	072621025.d	Client	ERB-071321-S	Aqueous	1	99902	Surrogates	Smp	0.1100		
18	WG20004-001	26-Jul-2021 15:36:42	072621026.d	Client	AOPC18-11E02A-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		
19	WG20004-001MS	26-Jul-2021 15:47:17	072621027.d	MS		Aqueous	1	99902	Analytes	100x PDS	0.2000		
20	WG20004-002	26-Jul-2021 15:57:54	072621028.d	Client	AOPC18-WNB-7-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		
21	WG20004-002DU	26-Jul-2021 16:08:33	072621029.d	Client		Aqueous	1	99902	Surrogates	Smp	0.1100		
22	WG20004-003	26-Jul-2021 16:19:05	072621030.d	Client	AOPC1-11N21A1-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		RR-50X, DNR-8:2 CCV
23	WG20004-004	26-Jul-2021 16:29:38	072621031.d	Client	AOPC8-W11-2-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		RR-1X-C/O
24	CCV 1000A_SVLC-1573	26-Jul-2021 16:40:13	072621032.d	CCV					Analytes	L-5	1.00		8:2 FTS HIGH-NCM/ND#
100	CCB C1	26-Jul-2021 16:50:54	072621033.d	InstBlk					Surrogates	Smp	0.1100		
25	WG20004-005	26-Jul-2021 17:01:36	072621034.d	Client	AOPC6-WV4-18-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		RR-10X, DNR-8:2 CCV
26	WG20004-006	26-Jul-2021 17:12:12	072621035.d	Client	FB04-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		
27	WG20004-007	26-Jul-2021 17:22:47	072621036.d	Client	AOPC25-15H12A-071321	Aqueous	1	99902	Surrogates	Smp	0.1100		
28	WG20004-008	26-Jul-2021 17:33:23	072621037.d	Client	AOPC25-15B10A-071321	Aqueous	1	99902	Surrogates	Smp	0.1100		
29	WG20004-009	26-Jul-2021 17:44:00	072621038.d	Client	AOPC24-64A-071321	Aqueous	1	99902	Surrogates	Smp	0.1100		
30	WG20004-010	26-Jul-2021 17:54:35	072621039.d	Client	AOPC24-WU4-1-071321	Aqueous	1	99902	Surrogates	Smp	0.1100		
31	WG20004-011	26-Jul-2021 18:05:13	072621040.d	Client	FB-05-071321	Aqueous	1	99902	Surrogates	Smp	0.1100		6:2 SUR HIGH-NCM/ND#
32	WG20004-012	26-Jul-2021 18:15:47	072621041.d	Client	AOPC5-WU4-19-071421	Aqueous	1	99902	Surrogates	Smp	0.1100		RR-10X
33	CCV 1000B_SVLC-1573	26-Jul-2021 18:26:20	072621042.d	CCV					Analytes	L-5	1.00		
100	CCB C2	26-Jul-2021 18:36:54	072621043.d	InstBlk					Surrogates	Smp	0.1100		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621005.d
Injection Date: 26-Jul-2021 11:54:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	107.38	107.4	70 - 130
D 46 13C4_PFBA	997866	984692			98.7	50 - 150
D 50 13C5_PFPeA	1059542	1013179			95.6	50 - 150
21 PFPeA			100.00	102.50	102.5	70 - 130
D 44 13C3_PFBS	297147	291659			98.2	50 - 150
7 PFBS			88.400	96.187	108.8	70 - 130
1 4:2 FTS			93.400	70.858	75.9	70 - 130
D 63 13C2_4:2 FTS_2	210753	241646			114.7	50 - 150
D 49 13C5_PFHxA	864384	865478			100.1	50 - 150
15 PFHxA			100.00	118.37	118.4	70 - 130
22 PFPeS			93.800	107.26	114.4	70 - 130
28 GenX			200.00	229.75	114.9	70 - 130
D 66 13C3_GenX	649017	731246			112.7	50 - 150
D 47 13C4_PFHpA	1037869	942733			90.8	50 - 150
13 PFHpA			100.00	99.99	100	70 - 130
D 45 13C3_PFHxS	261903	273340			104.4	50 - 150
14 PFHxS			91.000	88.689	97.5	70 - 130
29 ADONA			94.200	93.551	99.3	70 - 130
D 64 13C2_6:2 FTS_2	179008	218574			122.1	50 - 150
2 6:2 FTS			94.800	124.25	131.1	70 - 130
20 PFOA			100.00	121.27	121.3	70 - 130
D 53 13C8_PFOA	991369	884901			89.3	50 - 150
12 PFHpS			95.200	94.900	99.7	70 - 130
18 PFOS			92.800	86.561	93.3	70 - 130
D 54 13C8_PFOS	227393	230292			101.3	50 - 150
17 PFNA			100.00	107.36	107.4	70 - 130
D 56 13C9_PFNA	954829	914153			95.7	50 - 150
30 9Cl-PF3ONS			93.200	106.32	114.1	70 - 130
D 55 13C8_PFOSA	391661	447921			114.4	50 - 150
19 PFOSA			100.00	97.747	97.7	70 - 130
16 PFNS			96.000	113.07	117.8	70 - 130
D 65 13C2_8:2 FTS_2	132148	181716			137.5	50 - 150
3 8:2 FTS			95.800	119.62	124.9	70 - 130
10 PFDA			100.00	93.838	93.8	70 - 130
D 51 13C6_PFDA	824029	825008			100.1	50 - 150
6 N-MeFOSAA			100.00	100.51	100.5	70 - 130

NO SAMPLES ASSOCIATED

Report Date: 27-Jul-2021 15:28:59 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	862293	1037750			120.3	50 - 150
9 PFDS			96.400	101.52	105.3	70 - 130
D 52 13C7_PFUdA	741490	775811			104.6	50 - 150
5 N-EtFOSAA			100.00	116.63	116.6	70 - 130
25 PFUdA			100.00	88.909	88.9	70 - 130
D 60 d5-EtFOSAA	830172	934381			112.6	50 - 150
D 61 d7-MeFOSE	145483	133706			91.9	50 - 150
32 MeFOSE			100.00	113.25	113.2	70 - 130
26 MeFOSA			100.00	116.46	116.5	70 - 130
D 57 d3-MeFOSA	60705	68985			113.6	50 - 150
31 11Cl-PF3OUDS			94.200	93.115	98.8	70 - 130
D 62 d9-EtFOSE	135458	153258			113.1	50 - 150
11 PFDoA			100.00	93.516	93.5	70 - 130
D 38 13C2_PFDoA	798101	791414			99.2	50 - 150
4 10:2 FTS			96.400	78.696	81.6	70 - 130
33 EtFOSE			100.00	102.06	102.1	70 - 130
D 59 d5-EtFOSA	51036	74660			146.3	50 - 150
27 EtFOSA			100.00	75.355	75.4	70 - 130
34 PFDOS			96.800	94.509	97.6	70 - 130
24 PFTrDA			100.00	89.623	89.6	70 - 130
23 PFTeDA			100.00	100.83	100.8	70 - 130
D 42 13C2_PFTeDA	864247	801930			92.8	50 - 150
35 PFHxDA			100.00	98.820	98.8	70 - 130
D 40 13C2_PFHxDA	383301	505031			131.8	50 - 150
36 PFODA			100.00	95.452	95.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621006.d
Injection Date: 26-Jul-2021 12:05:12 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	212.53	106.3	70 - 130
D 46 13C4_PFBA	984692	951357			96.6	50 - 150
D 50 13C5_PFPeA	1013179	959980			94.7	50 - 150
21 PFPeA			200.00	205.45	102.7	70 - 130
D 44 13C3_PFBS	291659	279356			95.8	50 - 150
7 PFBS			176.80	186.83	105.7	70 - 130
1 4:2 FTS			186.80	195.36	104.6	70 - 130
D 63 13C2_4:2 FTS_2	241646	214168			88.6	50 - 150
D 49 13C5_PFHxA	865478	903385			104.4	50 - 150
15 PFHxA			200.00	195.69	97.8	70 - 130
22 PFPeS			187.60	170.40	90.8	70 - 130
28 GenX			400.00	447.02	111.8	70 - 130
D 66 13C3_GenX	731246	657488			89.9	50 - 150
D 47 13C4_PFHpA	942733	883789			93.7	50 - 150
13 PFHpA			200.00	201.77	100.9	70 - 130
D 45 13C3_PFHxS	273340	239124			87.5	50 - 150
14 PFHxS			182.00	195.39	107.4	70 - 130
29 ADONA			188.40	203.07	107.8	70 - 130
D 64 13C2_6:2 FTS_2	218574	218943			100.2	50 - 150
2 6:2 FTS			189.60	182.81	96.4	70 - 130
20 PFOA			200.00	196.16	98.1	70 - 130
D 53 13C8_PFOA	884901	905107			102.3	50 - 150
12 PFHpS			190.40	197.12	103.5	70 - 130
18 PFOS			185.60	192.26	103.6	70 - 130
D 54 13C8_PFOS	230292	217247			94.3	50 - 150
17 PFNA			200.00	214.01	107	70 - 130
D 56 13C9_PFNA	914153	823334			90.1	50 - 150
30 9Cl-PF3ONS			186.40	183.27	98.3	70 - 130
D 55 13C8_PFOSA	447921	425221			94.9	50 - 150
19 PFOSA			200.00	211.58	105.8	70 - 130
16 PFNS			192.00	182.82	95.2	70 - 130
D 65 13C2_8:2 FTS_2	181716	191568			105.4	50 - 150
3 8:2 FTS			191.60	190.44	99.4	70 - 130
10 PFDA			200.00	220.13	110.1	70 - 130
D 51 13C6_PFDA	825008	752068			91.2	50 - 150
6 N-MeFOSAA			200.00	199.92	100	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1037750	968149			93.3	50 - 150
9 PFDS			192.80	207.57	107.7	70 - 130
D 52 13C7_PFUdA	775811	719146			92.7	50 - 150
5 N-EtFOSAA			200.00	195.78	97.9	70 - 130
25 PFUdA			200.00	197.81	98.9	70 - 130
D 60 d5-EtFOSAA	934381	967698			103.6	50 - 150
D 61 d7-MeFOSE	133706	142880			106.9	50 - 150
32 MeFOSE			200.00	199.89	99.9	70 - 130
26 MeFOSA			200.00	223.51	111.8	70 - 130
D 57 d3-MeFOSA	68985	61775			89.5	50 - 150
31 11Cl-PF3OUDS			188.40	194.80	103.4	70 - 130
D 62 d9-EtFOSE	153258	156133			101.9	50 - 150
11 PFDoA			200.00	211.60	105.8	70 - 130
D 38 13C2_PFDoA	791414	740005			93.5	50 - 150
4 10:2 FTS			192.80	181.42	94.1	70 - 130
33 EtFOSE			200.00	181.64	90.8	70 - 130
D 59 d5-EtFOSA	74660	65009			87.1	50 - 150
27 EtFOSA			200.00	186.62	93.3	70 - 130
34 PFDOS			193.60	210.33	108.6	70 - 130
24 PFTrDA			200.00	207.55	103.8	70 - 130
23 PFTeDA			200.00	212.61	106.3	70 - 130
D 42 13C2_PFTeDA	801930	757497			94.5	50 - 150
35 PFHxDA			200.00	188.76	94.4	70 - 130
D 40 13C2_PFHxDA	505031	468086			92.7	50 - 150
36 PFODA			200.00	186.66	93.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621019.d
Injection Date: 26-Jul-2021 14:22:47 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 11
Sample Info: CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	919.98	92	70 - 130
D 46 13C4_PFBA	984692	1025760			104.2	50 - 150
D 50 13C5_PFPeA	1013179	1015649			100.2	50 - 150
21 PFPeA			1000.00	954.85	95.5	70 - 130
D 44 13C3_PFBS	291659	306768			105.2	50 - 150
7 PFBS			884.00	822.94	93.1	70 - 130
1 4:2 FTS			934.00	879.61	94.2	70 - 130
D 63 13C2_4:2 FTS_2	241646	302687			125.3	50 - 150
D 49 13C5_PFHxA	865478	890503			102.9	50 - 150
15 PFHxA			1000.00	931.73	93.2	70 - 130
22 PFPeS			938.00	856.96	91.4	70 - 130
28 GenX			2000.00	1928.29	96.4	70 - 130
D 66 13C3_GenX	731246	719068			98.3	50 - 150
D 47 13C4_PFHpA	942733	1022920			108.5	50 - 150
13 PFHpA			1000.00	882.90	88.3	70 - 130
D 45 13C3_PFHxS	273340	287354			105.1	50 - 150
14 PFHxS			910.00	770.24	84.6	70 - 130
29 ADONA			942.00	867.24	92.1	70 - 130
D 64 13C2_6:2 FTS_2	218574	271903			124.4	50 - 150
2 6:2 FTS			948.00	1015.64	107.1	70 - 130
20 PFOA			1000.00	892.73	89.3	70 - 130
D 53 13C8_PFOA	884901	1001029			113.1	50 - 150
12 PFHpS			952.00	798.44	83.9	70 - 130
18 PFOS			928.00	857.07	92.4	70 - 130
D 54 13C8_PFOS	230292	225080			97.7	50 - 150
17 PFNA			1000.00	819.88	82	70 - 130
D 56 13C9_PFNA	914153	1075005			117.6	50 - 150
30 9Cl-PF3ONS			932.00	905.50	97.2	70 - 130
D 55 13C8_PFOSA	447921	433126			96.7	50 - 150
19 PFOSA			1000.00	983.95	98.4	70 - 130
16 PFNS			960.00	976.86	101.8	70 - 130
D 65 13C2_8:2 FTS_2	181716	171904			94.6	50 - 150
3 8:2 FTS			958.00	1060.59	110.7	70 - 130
10 PFDA			1000.00	872.71	87.3	70 - 130
D 51 13C6_PFDA	825008	847763			102.8	50 - 150
6 N-MeFOSAA			1000.00	1148.81	114.9	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1037750	958700			92.4	50 - 150
9 PFDS			964.00	958.91	99.5	70 - 130
D 52 13C7_PFUdA	775811	800038			103.1	50 - 150
5 N-EtFOSAA			1000.00	1020.89	102.1	70 - 130
25 PFUdA			1000.00	895.23	89.5	70 - 130
D 60 d5-EtFOSAA	934381	861148			92.2	50 - 150
D 61 d7-MeFOSE	133706	146384			109.5	50 - 150
32 MeFOSE			1000.00	970.99	97.1	70 - 130
26 MeFOSA			1000.00	1098.31	109.8	70 - 130
D 57 d3-MeFOSA	68985	56468			81.9	50 - 150
31 11Cl-PF3OUDS			942.00	879.32	93.3	70 - 130
D 62 d9-EtFOSE	153258	140355			91.6	50 - 150
11 PFDoA			1000.00	907.77	90.8	70 - 130
D 38 13C2_PFDoA	791414	794274			100.4	50 - 150
4 10:2 FTS			964.00	1018.62	105.7	70 - 130
33 EtFOSE			1000.00	981.53	98.2	70 - 130
D 59 d5-EtFOSA	74660	53978			72.3	50 - 150
27 EtFOSA			1000.00	946.25	94.6	70 - 130
34 PFDOS			968.00	881.53	91.1	70 - 130
24 PFTrDA			1000.00	917.31	91.7	70 - 130
23 PFTeDA			1000.00	872.26	87.2	70 - 130
D 42 13C2_PFTeDA	801930	843798			105.2	50 - 150
35 PFHxDA			1000.00	963.14	96.3	70 - 130
D 40 13C2_PFHxDA	505031	444500			88	50 - 150
36 PFODA			1000.00	981.24	98.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621032.d
Injection Date: 26-Jul-2021 16:40:13 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 24
Sample Info: CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	889.38	88.9	70 - 130
D 46 13C4_PFBA	984692	1062934			107.9	50 - 150
D 50 13C5_PFPeA	1013179	1069753			105.6	50 - 150
21 PFPeA			1000.00	899.16	89.9	70 - 130
D 44 13C3_PFBS	291659	310108			106.3	50 - 150
7 PFBS			884.00	821.52	92.9	70 - 130
1 4:2 FTS			934.00	822.87	88.1	70 - 130
D 63 13C2_4:2 FTS_2	241646	276561			114.4	50 - 150
D 49 13C5_PFHxA	865478	981736			113.4	50 - 150
15 PFHxA			1000.00	904.93	90.5	70 - 130
22 PFPeS			938.00	891.63	95.1	70 - 130
28 GenX			2000.00	2234.66	111.7	70 - 130
D 66 13C3_GenX	731246	684910			93.7	50 - 150
D 47 13C4_PFHpA	942733	956842			101.5	50 - 150
13 PFHpA			1000.00	951.48	95.1	70 - 130
D 45 13C3_PFHxS	273340	278414			101.9	50 - 150
14 PFHxS			910.00	790.50	86.9	70 - 130
29 ADONA			942.00	841.34	89.3	70 - 130
D 64 13C2_6:2 FTS_2	218574	208068			95.2	50 - 150
2 6:2 FTS			948.00	1028.02	108.4	70 - 130
20 PFOA			1000.00	883.03	88.3	70 - 130
D 53 13C8_PFOA	884901	984701			111.3	50 - 150
12 PFHpS			952.00	879.71	92.4	70 - 130
18 PFOS			928.00	892.11	96.1	70 - 130
D 54 13C8_PFOS	230292	235760			102.4	50 - 150
17 PFNA			1000.00	878.77	87.9	70 - 130
D 56 13C9_PFNA	914153	1014615			111	50 - 150
30 9Cl-PF3ONS			932.00	875.82	94	70 - 130
D 55 13C8_PFOSA	447921	387291			86.5	50 - 150
19 PFOSA			1000.00	1122.27	112.2	70 - 130
16 PFNS			960.00	854.77	89	70 - 130
D 65 13C2_8:2 FTS_2	181716	158859			87.4	50 - 150
3 8:2 FTS			958.00	1380.63	144.1	70 - 130
10 PFDA			1000.00	733.97	73.4	70 - 130
D 51 13C6_PFDA	825008	975461			118.2	50 - 150
6 N-MeFOSAA			1000.00	1054.54	105.5	70 - 130

Report Date: 27-Jul-2021 15:29:17 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621032.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1037750	918129			88.5	50 - 150
9 PFDS			964.00	858.65	89.1	70 - 130
D 52 13C7_PFUdA	775811	843744			108.8	50 - 150
5 N-EtFOSAA			1000.00	1009.03	100.9	70 - 130
25 PFUdA			1000.00	791.23	79.1	70 - 130
D 60 d5-EtFOSAA	934381	932966			99.8	50 - 150
D 61 d7-MeFOSE	133706	152698			114.2	50 - 150
32 MeFOSE			1000.00	969.97	97	70 - 130
26 MeFOSA			1000.00	1008.61	100.9	70 - 130
D 57 d3-MeFOSA	68985	66920			97	50 - 150
31 11Cl-PF3OUDS			942.00	833.64	88.5	70 - 130
D 62 d9-EtFOSE	153258	161443			105.3	50 - 150
11 PFDoA			1000.00	838.85	83.9	70 - 130
D 38 13C2_PFDoA	791414	851296			107.6	50 - 150
4 10:2 FTS			964.00	896.72	93	70 - 130
33 EtFOSE			1000.00	827.07	82.7	70 - 130
D 59 d5-EtFOSA	74660	61645			82.6	50 - 150
27 EtFOSA			1000.00	948.92	94.9	70 - 130
34 PFDOS			968.00	903.38	93.3	70 - 130
24 PFTrDA			1000.00	804.16	80.4	70 - 130
23 PFTeDA			1000.00	982.41	98.2	70 - 130
D 42 13C2_PFTeDA	801930	736517			91.8	50 - 150
35 PFHxDA			1000.00	961.96	96.2	70 - 130
D 40 13C2_PFHxDA	505031	450624			89.2	50 - 150
36 PFODA			1000.00	1047.33	104.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621042.d
Injection Date: 26-Jul-2021 18:26:20 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 33
Sample Info: CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	917.43	91.7	70 - 130
D 46 13C4_PFBA	984692	999433			101.5	50 - 150
D 50 13C5_PFPeA	1013179	1030303			101.7	50 - 150
21 PFPeA			1000.00	888.56	88.9	70 - 130
D 44 13C3_PFBS	291659	284377			97.5	50 - 150
7 PFBS			884.00	820.34	92.8	70 - 130
1 4:2 FTS			934.00	1028.25	110.1	70 - 130
D 63 13C2_4:2 FTS_2	241646	224894			93.1	50 - 150
D 49 13C5_PFHxA	865478	916367			105.9	50 - 150
15 PFHxA			1000.00	892.38	89.2	70 - 130
22 PFPeS			938.00	863.66	92.1	70 - 130
28 GenX			2000.00	2264.51	113.2	70 - 130
D 66 13C3_GenX	731246	629007			86	50 - 150
D 47 13C4_PFHpA	942733	911800			96.7	50 - 150
13 PFHpA			1000.00	977.25	97.7	70 - 130
D 45 13C3_PFHxS	273340	264300			96.7	50 - 150
14 PFHxS			910.00	815.37	89.6	70 - 130
29 ADONA			942.00	818.92	86.9	70 - 130
D 64 13C2_6:2 FTS_2	218574	208864			95.6	50 - 150
2 6:2 FTS			948.00	978.61	103.2	70 - 130
20 PFOA			1000.00	961.35	96.1	70 - 130
D 53 13C8_PFOA	884901	913728			103.3	50 - 150
12 PFHpS			952.00	894.25	93.9	70 - 130
18 PFOS			928.00	858.50	92.5	70 - 130
D 54 13C8_PFOS	230292	224820			97.6	50 - 150
17 PFNA			1000.00	914.62	91.5	70 - 130
D 56 13C9_PFNA	914153	1004264			109.9	50 - 150
30 9Cl-PF3ONS			932.00	898.01	96.4	70 - 130
D 55 13C8_PFOSA	447921	409255			91.4	50 - 150
19 PFOSA			1000.00	1054.71	105.5	70 - 130
16 PFNS			960.00	927.37	96.6	70 - 130
D 65 13C2_8:2 FTS_2	181716	178582			98.3	50 - 150
3 8:2 FTS			958.00	1008.48	105.3	70 - 130
10 PFDA			1000.00	935.99	93.6	70 - 130
D 51 13C6_PFDA	825008	819784			99.4	50 - 150
6 N-MeFOSAA			1000.00	1109.89	111	70 - 130

Report Date: 27-Jul-2021 15:29:28 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072621-DOD.b\072621042.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1037750	935910			90.2	50 - 150
9 PFDS			964.00	884.68	91.8	70 - 130
D 52 13C7_PFUdA	775811	871916			112.4	50 - 150
5 N-EtFOSAA			1000.00	1017.66	101.8	70 - 130
25 PFUdA			1000.00	855.47	85.5	70 - 130
D 60 d5-EtFOSAA	934381	870147			93.1	50 - 150
D 61 d7-MeFOSE	133706	146339			109.4	50 - 150
32 MeFOSE			1000.00	1054.43	105.4	70 - 130
26 MeFOSA			1000.00	944.62	94.5	70 - 130
D 57 d3-MeFOSA	68985	62363			90.4	50 - 150
31 11Cl-PF3OUDS			942.00	896.34	95.2	70 - 130
D 62 d9-EtFOSE	153258	146212			95.4	50 - 150
11 PFDoA			1000.00	867.52	86.8	70 - 130
D 38 13C2_PFDoA	791414	786044			99.3	50 - 150
4 10:2 FTS			964.00	778.15	80.7	70 - 130
33 EtFOSE			1000.00	948.95	94.9	70 - 130
D 59 d5-EtFOSA	74660	54552			73.1	50 - 150
27 EtFOSA			1000.00	990.73	99.1	70 - 130
34 PFDOS			968.00	946.22	97.7	70 - 130
24 PFTrDA			1000.00	884.17	88.4	70 - 130
23 PFTeDA			1000.00	843.87	84.4	70 - 130
D 42 13C2_PFTeDA	801930	824879			102.9	50 - 150
35 PFHxDA			1000.00	954.53	95.5	70 - 130
D 40 13C2_PFHxDA	505031	419359			83	50 - 150
36 PFODA			1000.00	997.12	99.7	70 - 130

Report Date: 29-Jul-2021 12:33:45 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch:	\\Organics\LL\LCMSMS01.i\072721-DOD.b		
Method:	LCMSMS01_PFAS-ID.M	Version: V7	21-Apr-2021 14:28:49
Instrument:	LCMSMS01.i	Integrator:	picker
Cal Start Date:	22-Jul-2021 16:28:35	Cal End Date:	22-Jul-2021 18:03:42
Method Lock:	Unlocked	Lock Date:	
Calib Method:	PFAS-ID	No.Compounds:	66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	CCV 100_SVLC-1546	27-Jul-2021 11:19:37	072721005.d	CCV					Analytes	L-2	1.00		
96	CCV 200_SVLC-1547	27-Jul-2021 11:30:10	072721006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	27-Jul-2021 11:40:41	072721007.d	InstBlk					Surrogates	Smp	0.1100		
12	CCV 1000_SVLC-1573	27-Jul-2021 14:08:45	072721021.d	CCV					Analytes	L-5	1.00		
100	CCB C1	27-Jul-2021 14:19:18	072721022.d	InstBlk					Surrogates	Smp	0.1100		
13	WG12034-001	27-Jul-2021 14:30:00	072721023.d	Client	GMW-01	Aqueous	200	99698	Surrogates	Smp	0.1100		Not needed
14	WG20004-003	27-Jul-2021 14:40:32	072721024.d	Client	AOPC1-11N21A1-071221	Aqueous	50	99902	Surrogates	Smp	0.1100		
15	WG20004-004	27-Jul-2021 14:51:04	072721025.d	Client	AOPC8-W11-2-071221	Aqueous	1	99902	Surrogates	Smp	0.1100		4:2 sur HI, NCM/ND# , MeAA,EtAA surs low-NCM/Mtx#
16	WG20004-005	27-Jul-2021 15:01:37	072721026.d	Client	AOPC6-WV4-18-071221	Aqueous	10	99902	Surrogates	Smp	0.1100		
17	WG20004-012	27-Jul-2021 15:12:11	072721027.d	Client	AOPC5-WU4-19-071421	Aqueous	10	99902	Surrogates	Smp	0.1100		
18	CCV 1000A_SVLC-1573	27-Jul-2021 15:22:44	072721028.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072721-DOD.b\072721005.d
Injection Date: 27-Jul-2021 11:19:37 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	102.56	102.6	70 - 130
D 46 13C4_PFBA	997866	1070710			107.3	50 - 150
D 50 13C5_PFPeA	1059542	1069849			101	50 - 150
21 PFPeA			100.00	102.50	102.5	70 - 130
D 44 13C3_PFBS	297147	299705			100.9	50 - 150
7 PFBS			88.400	100.16	113.3	70 - 130
1 4:2 FTS			93.400	101.62	108.8	70 - 130
D 63 13C2_4:2 FTS_2	210753	258140			122.5	50 - 150
D 49 13C5_PFHxA	864384	933130			108	50 - 150
15 PFHxA			100.00	100.39	100.4	70 - 130
22 PFPeS			93.800	97.213	103.6	70 - 130
28 GenX			200.00	208.19	104.1	70 - 130
D 66 13C3_GenX	649017	834637			128.6	50 - 150
D 47 13C4_PFHpA	1037869	956143			92.1	50 - 150
13 PFHpA			100.00	97.612	97.6	70 - 130
D 45 13C3_PFHxS	261903	274362			104.8	50 - 150
14 PFHxS			91.000	85.877	94.4	70 - 130
29 ADONA			94.200	100.14	106.3	70 - 130
D 64 13C2_6:2 FTS_2	179008	238062			133	50 - 150
2 6:2 FTS			94.800	86.328	91.1	70 - 130
20 PFOA			100.00	106.96	107	70 - 130
D 53 13C8_PFOA	991369	972147			98.1	50 - 150
12 PFHpS			95.200	101.41	106.5	70 - 130
18 PFOS			92.800	82.375	88.8	70 - 130
D 54 13C8_PFOS	227393	243064			106.9	50 - 150
17 PFNA			100.00	114.18	114.2	70 - 130
D 56 13C9_PFNA	954829	919672			96.3	50 - 150
30 9Cl-PF3ONS			93.200	89.491	96	70 - 130
D 55 13C8_PFOSA	391661	446481			114	50 - 150
19 PFOSA			100.00	105.50	105.5	70 - 130
16 PFNS			96.000	105.23	109.6	70 - 130
D 65 13C2_8:2 FTS_2	132148	187464			141.9	50 - 150
3 8:2 FTS			95.800	102.10	106.6	70 - 130
10 PFDA			100.00	107.88	107.9	70 - 130
D 51 13C6_PFDA	824029	816251			99.1	50 - 150
6 N-MeFOSAA			100.00	115.97	116	70 - 130

Report Date: 29-Jul-2021 12:33:32 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072721-DOD.b\072721005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	862293	1079958			125.2	50 - 150
9 PFDS			96.400	96.393	100	70 - 130
D 52 13C7_PFUdA	741490	713572			96.2	50 - 150
5 N-EtFOSAA			100.00	96.477	96.5	70 - 130
25 PFUdA			100.00	106.81	106.8	70 - 130
D 60 d5-EtFOSAA	830172	1117635			134.6	50 - 150
D 61 d7-MeFOSE	145483	158819			109.2	50 - 150
32 MeFOSE			100.00	96.487	96.5	70 - 130
26 MeFOSA			100.00	126.25	126.3	70 - 130
D 57 d3-MeFOSA	60705	74466			122.7	50 - 150
31 11Cl-PF3OUDS			94.200	91.494	97.1	70 - 130
D 62 d9-EtFOSE	135458	145717			107.6	50 - 150
11 PFDoA			100.00	115.90	115.9	70 - 130
D 38 13C2_PFDoA	798101	774526			97	50 - 150
4 10:2 FTS			96.400	90.071	93.4	70 - 130
33 EtFOSE			100.00	101.19	101.2	70 - 130
D 59 d5-EtFOSA	51036	61425			120.4	50 - 150
27 EtFOSA			100.00	86.273	86.3	70 - 130
34 PFDOS			96.800	93.386	96.5	70 - 130
24 PFTrDA			100.00	96.391	96.4	70 - 130
23 PFTeDA			100.00	103.10	103.1	70 - 130
D 42 13C2_PFTeDA	864247	792585			91.7	50 - 150
35 PFHxDA			100.00	106.18	106.2	70 - 130
D 40 13C2_PFHxDA	383301	468983			122.4	50 - 150
36 PFODA			100.00	101.61	101.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072721-DOD.b\072721006.d
Injection Date: 27-Jul-2021 11:30:10 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	206.93	103.5	70 - 130
D 46 13C4_PFBA	1070710	1018946			95.2	50 - 150
D 50 13C5_PFPeA	1069849	1063829			99.4	50 - 150
21 PFPeA			200.00	195.46	97.7	70 - 130
D 44 13C3_PFBS	299705	307434			102.6	50 - 150
7 PFBS			176.80	193.94	109.7	70 - 130
1 4:2 FTS			186.80	203.34	108.9	70 - 130
D 63 13C2_4:2 FTS_2	258140	250825			97.2	50 - 150
D 49 13C5_PFHxA	933130	921959			98.8	50 - 150
15 PFHxA			200.00	216.48	108.2	70 - 130
22 PFPeS			187.60	179.98	95.9	70 - 130
28 GenX			400.00	436.16	109	70 - 130
D 66 13C3_GenX	834637	740604			88.7	50 - 150
D 47 13C4_PFHpA	956143	932025			97.5	50 - 150
13 PFHpA			200.00	208.01	104	70 - 130
D 45 13C3_PFHxS	274362	267807			97.6	50 - 150
14 PFHxS			182.00	178.11	97.9	70 - 130
29 ADONA			188.40	193.05	102.5	70 - 130
D 64 13C2_6:2 FTS_2	238062	233457			98.1	50 - 150
2 6:2 FTS			189.60	216.47	114.2	70 - 130
20 PFOA			200.00	206.98	103.5	70 - 130
D 53 13C8_PFOA	972147	962159			99	50 - 150
12 PFHpS			190.40	203.75	107	70 - 130
18 PFOS			185.60	211.45	113.9	70 - 130
D 54 13C8_PFOS	243064	243081			100	50 - 150
17 PFNA			200.00	226.16	113.1	70 - 130
D 56 13C9_PFNA	919672	941476			102.4	50 - 150
30 9Cl-PF3ONS			186.40	176.76	94.8	70 - 130
D 55 13C8_PFOSA	446481	493020			110.4	50 - 150
19 PFOSA			200.00	191.77	95.9	70 - 130
16 PFNS			192.00	192.43	100.2	70 - 130
D 65 13C2_8:2 FTS_2	187464	181681			96.9	50 - 150
3 8:2 FTS			191.60	226.09	118	70 - 130
10 PFDA			200.00	224.77	112.4	70 - 130
D 51 13C6_PFDA	816251	770480			94.4	50 - 150
6 N-MeFOSAA			200.00	192.31	96.2	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1079958	1060323			98.2	50 - 150
9 PFDS			192.80	184.47	95.7	70 - 130
D 52 13C7_PFUdA	713572	804609			112.8	50 - 150
5 N-EtFOSAA			200.00	255.92	128	70 - 130
25 PFUdA			200.00	191.13	95.6	70 - 130
D 60 d5-EtFOSAA	1117635	1039055			93	50 - 150
D 61 d7-MeFOSE	158819	154735			97.4	50 - 150
32 MeFOSE			200.00	186.46	93.2	70 - 130
26 MeFOSA			200.00	191.74	95.9	70 - 130
D 57 d3-MeFOSA	74466	65978			88.6	50 - 150
31 11Cl-PF3OUDS			188.40	176.56	93.7	70 - 130
D 62 d9-EtFOSE	145717	150952			103.6	50 - 150
11 PFDoA			200.00	187.76	93.9	70 - 130
D 38 13C2_PFDoA	774526	750945			97	50 - 150
4 10:2 FTS			192.80	172.72	89.6	70 - 130
33 EtFOSE			200.00	199.02	99.5	70 - 130
D 59 d5-EtFOSA	61425	59538			96.9	50 - 150
27 EtFOSA			200.00	221.89	110.9	70 - 130
34 PFDOS			193.60	189.92	98.1	70 - 130
24 PFTrDA			200.00	185.86	92.9	70 - 130
23 PFTeDA			200.00	211.78	105.9	70 - 130
D 42 13C2_PFTeDA	792585	739203			93.3	50 - 150
35 PFHxDA			200.00	210.91	105.5	70 - 130
D 40 13C2_PFHxDA	468983	466277			99.4	50 - 150
36 PFODA			200.00	196.32	98.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072721-DOD.b\072721021.d
Injection Date: 27-Jul-2021 14:08:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 12
Sample Info: CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	904.37	90.4	70 - 130
D 46 13C4_PFBA	1070710	1061652			99.2	50 - 150
D 50 13C5_PFPeA	1069849	975978			91.2	50 - 150
21 PFPeA			1000.00	988.59	98.9	70 - 130
D 44 13C3_PFBS	299705	317328			105.9	50 - 150
7 PFBS			884.00	836.39	94.6	70 - 130
1 4:2 FTS			934.00	988.19	105.8	70 - 130
D 63 13C2_4:2 FTS_2	258140	246065			95.3	50 - 150
D 49 13C5_PFHxA	933130	946676			101.5	50 - 150
15 PFHxA			1000.00	962.97	96.3	70 - 130
22 PFPeS			938.00	917.24	97.8	70 - 130
28 GenX			2000.00	1912.16	95.6	70 - 130
D 66 13C3_GenX	834637	727244			87.1	50 - 150
D 47 13C4_PFHpA	956143	1081979			113.2	50 - 150
13 PFHpA			1000.00	885.12	88.5	70 - 130
D 45 13C3_PFHxS	274362	262009			95.5	50 - 150
14 PFHxS			910.00	886.58	97.4	70 - 130
29 ADONA			942.00	1004.76	106.7	70 - 130
D 64 13C2_6:2 FTS_2	238062	259016			108.8	50 - 150
2 6:2 FTS			948.00	904.98	95.5	70 - 130
20 PFOA			1000.00	955.53	95.6	70 - 130
D 53 13C8_PFOA	972147	934146			96.1	50 - 150
12 PFHpS			952.00	950.06	99.8	70 - 130
18 PFOS			928.00	831.72	89.6	70 - 130
D 54 13C8_PFOS	243064	239054			98.4	50 - 150
17 PFNA			1000.00	919.36	91.9	70 - 130
D 56 13C9_PFNA	919672	994946			108.2	50 - 150
30 9Cl-PF3ONS			932.00	926.36	99.4	70 - 130
D 55 13C8_PFOSA	446481	426835			95.6	50 - 150
19 PFOSA			1000.00	1045.00	104.5	70 - 130
16 PFNS			960.00	965.35	100.6	70 - 130
D 65 13C2_8:2 FTS_2	187464	176393			94.1	50 - 150
3 8:2 FTS			958.00	1225.42	127.9	70 - 130
10 PFDA			1000.00	907.80	90.8	70 - 130
D 51 13C6_PFDA	816251	890956			109.2	50 - 150
6 N-MeFOSAA			1000.00	850.56	85.1	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1079958	1164926			107.9	50 - 150
9 PFDS			964.00	832.50	86.4	70 - 130
D 52 13C7_PFUdA	713572	789209			110.6	50 - 150
5 N-EtFOSAA			1000.00	913.95	91.4	70 - 130
25 PFUdA			1000.00	925.35	92.5	70 - 130
D 60 d5-EtFOSAA	1117635	948605			84.9	50 - 150
D 61 d7-MeFOSE	158819	141290			89	50 - 150
32 MeFOSE			1000.00	1056.18	105.6	70 - 130
26 MeFOSA			1000.00	1075.16	107.5	70 - 130
D 57 d3-MeFOSA	74466	59855			80.4	50 - 150
31 11Cl-PF3OUDS			942.00	878.98	93.3	70 - 130
D 62 d9-EtFOSE	145717	138550			95.1	50 - 150
11 PFDoA			1000.00	894.53	89.5	70 - 130
D 38 13C2_PFDoA	774526	784445			101.3	50 - 150
4 10:2 FTS			964.00	880.37	91.3	70 - 130
33 EtFOSE			1000.00	1029.88	103	70 - 130
D 59 d5-EtFOSA	61425	57123			93	50 - 150
27 EtFOSA			1000.00	988.19	98.8	70 - 130
34 PFDOS			968.00	906.46	93.6	70 - 130
24 PFTrDA			1000.00	981.96	98.2	70 - 130
23 PFTeDA			1000.00	912.44	91.2	70 - 130
D 42 13C2_PFTeDA	792585	782094			98.7	50 - 150
35 PFHxDA			1000.00	956.47	95.6	70 - 130
D 40 13C2_PFHxDA	468983	453374			96.7	50 - 150
36 PFODA			1000.00	978.66	97.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072721-DOD.b\072721028.d
Injection Date: 27-Jul-2021 15:22:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 18
Sample Info: CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	887.14	88.7	70 - 130
D 46 13C4_PFBA	1070710	1043555			97.5	50 - 150
D 50 13C5_PFPeA	1069849	981902			91.8	50 - 150
21 PFPeA			1000.00	989.59	99	70 - 130
D 44 13C3_PFBS	299705	292465			97.6	50 - 150
7 PFBS			884.00	863.18	97.6	70 - 130
1 4:2 FTS			934.00	967.68	103.6	70 - 130
D 63 13C2_4:2 FTS_2	258140	229530			88.9	50 - 150
D 49 13C5_PFHxA	933130	900855			96.5	50 - 150
15 PFHxA			1000.00	988.27	98.8	70 - 130
22 PFPeS			938.00	881.81	94	70 - 130
28 GenX			2000.00	1930.56	96.5	70 - 130
D 66 13C3_GenX	834637	702643			84.2	50 - 150
D 47 13C4_PFHpA	956143	867368			90.7	50 - 150
13 PFHpA			1000.00	1077.92	107.8	70 - 130
D 45 13C3_PFHxS	274362	268994			98	50 - 150
14 PFHxS			910.00	829.54	91.2	70 - 130
29 ADONA			942.00	882.72	93.7	70 - 130
D 64 13C2_6:2 FTS_2	238062	227590			95.6	50 - 150
2 6:2 FTS			948.00	980.73	103.5	70 - 130
20 PFOA			1000.00	919.33	91.9	70 - 130
D 53 13C8_PFOA	972147	946019			97.3	50 - 150
12 PFHpS			952.00	905.11	95.1	70 - 130
18 PFOS			928.00	926.51	99.8	70 - 130
D 54 13C8_PFOS	243064	227554			93.6	50 - 150
17 PFNA			1000.00	871.22	87.1	70 - 130
D 56 13C9_PFNA	919672	1002644			109	50 - 150
30 9Cl-PF3ONS			932.00	881.12	94.5	70 - 130
D 55 13C8_PFOSA	446481	435819			97.6	50 - 150
19 PFOSA			1000.00	988.41	98.8	70 - 130
16 PFNS			960.00	851.92	88.7	70 - 130
D 65 13C2_8:2 FTS_2	187464	174087			92.9	50 - 150
3 8:2 FTS			958.00	1041.93	108.8	70 - 130
10 PFDA			1000.00	924.59	92.5	70 - 130
D 51 13C6_PFDA	816251	822626			100.8	50 - 150
6 N-MeFOSAA			1000.00	1119.71	112	70 - 130

Report Date: 29-Jul-2021 12:33:30 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072721-DOD.b\072721028.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1079958	964524			89.3	50 - 150
9 PFDS			964.00	962.54	99.8	70 - 130
D 52 13C7_PFUdA	713572	783818			109.8	50 - 150
5 N-EtFOSAA			1000.00	1023.33	102.3	70 - 130
25 PFUdA			1000.00	886.24	88.6	70 - 130
D 60 d5-EtFOSAA	1117635	892633			79.9	50 - 150
D 61 d7-MeFOSE	158819	140584			88.5	50 - 150
32 MeFOSE			1000.00	1001.98	100.2	70 - 130
26 MeFOSA			1000.00	1175.10	117.5	70 - 130
D 57 d3-MeFOSA	74466	57573			77.3	50 - 150
31 11Cl-PF3OUDS			942.00	922.73	98	70 - 130
D 62 d9-EtFOSE	145717	149397			102.5	50 - 150
11 PFDoA			1000.00	911.89	91.2	70 - 130
D 38 13C2_PFDoA	774526	750090			96.8	50 - 150
4 10:2 FTS			964.00	835.33	86.7	70 - 130
33 EtFOSE			1000.00	917.21	91.7	70 - 130
D 59 d5-EtFOSA	61425	60346			98.2	50 - 150
27 EtFOSA			1000.00	1002.47	100.2	70 - 130
34 PFDOS			968.00	898.08	92.8	70 - 130
24 PFTrDA			1000.00	895.76	89.6	70 - 130
23 PFTeDA			1000.00	902.33	90.2	70 - 130
D 42 13C2_PFTeDA	792585	784777			99	50 - 150
35 PFHxDA			1000.00	951.14	95.1	70 - 130
D 40 13C2_PFHxDA	468983	431630			92	50 - 150
36 PFODA			1000.00	1038.99	103.9	70 - 130

Report Date: 29-Jul-2021 12:58:35 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\072821-DOD.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 22-Jul-2021 16:28:35 Cal End Date: 22-Jul-2021 18:03:42

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	CCV 100_SVLC-1546	28-Jul-2021 11:31:11	072821007.d	CCV					Analytes	L-2	1.00		
96	CCV 200_SVLC-1547	28-Jul-2021 11:41:45	072821008.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	28-Jul-2021 11:52:16	072821009.d	InstBlk					Surrogates	Smp	0.1100		
42	ID CCV 1000B_SVLC-1573	28-Jul-2021 19:27:22	072821052.d	CCV					Analytes	L-5	1.00		
100	CCB C2	28-Jul-2021 19:37:56	072821053.d	InstBlk					Surrogates	Smp	0.1100		
43	WQ99698-001	28-Jul-2021 19:48:36	072821054.d	MBlk		Aqueous	1	99698	Surrogates	Smp	0.1100		
44	WQ99698-002	28-Jul-2021 19:59:13	072821055.d	LCS		Aqueous	1	99698	Analytes	100x PDS	0.2000		
45	WQ10113-001	28-Jul-2021 20:09:46	072821056.d	MBlk		Aqueous	1	10113	Surrogates	Smp	0.1100		
46	WQ10113-002	28-Jul-2021 20:20:23	072821057.d	LCS		Aqueous	1	10113	Analytes	100x PDS	0.2000		
47	STACKED BLK 21-1636	28-Jul-2021 20:30:57	072821058.d	InstBlk					Surrogates	Smp	0.1100		
48	STACKED LCS 21-1636	28-Jul-2021 20:41:34	072821059.d	LCS		Aqueous	1		Analytes	100x PDS	0.2000		
49	WG20004-013	28-Jul-2021 20:52:11	072821060.d	Client	AOPC5-14039A-071421	Aqueous	1	10113	Surrogates	Smp	0.1100		MANY SUR LOW-NCM/MTX,RR-500X
50	WG20004-014	28-Jul-2021 21:02:49	072821061.d	Client	AOPC3-W7-9-071421	Aqueous	1	10113	Surrogates	Smp	0.1100		RR-1X-C/O
51	WG20004-015	28-Jul-2021 21:13:28	072821062.d	Client	AOPC5-WNB-14-071421	Aqueous	1	10113	Surrogates	Smp	0.1100		RR-1X-C/O
52	WG20004-016	28-Jul-2021 21:24:03	072821063.d	Client	FB-06-071421	Aqueous	1	10113	Surrogates	Smp	0.1100		RR-1X-C/O
53	WG20004-017	28-Jul-2021 21:34:39	072821064.d	Client	AOPC1,7-WU4-9-071521	Aqueous	1	10113	Surrogates	Smp	0.1100		
54	WG20004-018	28-Jul-2021 21:45:15	072821065.d	Client	AOPC1,7-PZA1-5C-071521	Aqueous	1	10113	Surrogates	Smp	0.1100		
55	WG20004-018MS	28-Jul-2021 21:55:49	072821066.d	MS		Aqueous	1	10113	Analytes	100x PDS	0.2000		
56	WG20004-018MD	28-Jul-2021 22:06:26	072821067.d	MSD		Aqueous	1	10113	Analytes	100x PDS	0.2000		
57	CCV 1000C_SVLC-1573	28-Jul-2021 22:17:04	072821068.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072821-DOD.b\072821007.d
Injection Date: 28-Jul-2021 11:31:11 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	109.02	109	70 - 130
D 46 13C4_PFBA	997866	1061058			106.3	50 - 150
D 50 13C5_PFPeA	1059542	1100903			103.9	50 - 150
21 PFPeA			100.00	97.789	97.8	70 - 130
D 44 13C3_PFBS	297147	298962			100.6	50 - 150
7 PFBS			88.400	98.336	111.2	70 - 130
1 4:2 FTS			93.400	112.17	120.1	70 - 130
D 63 13C2_4:2 FTS_2	210753	261397			124	50 - 150
D 49 13C5_PFHxA	864384	935187			108.2	50 - 150
15 PFHxA			100.00	101.14	101.1	70 - 130
22 PFPeS			93.800	96.584	103	70 - 130
28 GenX			200.00	223.67	111.8	70 - 130
D 66 13C3_GenX	649017	740433			114.1	50 - 150
D 47 13C4_PFHpA	1037869	988780			95.3	50 - 150
13 PFHpA			100.00	101.10	101.1	70 - 130
D 45 13C3_PFHxS	261903	279638			106.8	50 - 150
14 PFHxS			91.000	88.540	97.3	70 - 130
29 ADONA			94.200	112.89	119.8	70 - 130
D 64 13C2_6:2 FTS_2	179008	250200			139.8	50 - 150
2 6:2 FTS			94.800	109.48	115.5	70 - 130
20 PFOA			100.00	109.71	109.7	70 - 130
D 53 13C8_PFOA	991369	974681			98.3	50 - 150
12 PFHpS			95.200	92.837	97.5	70 - 130
18 PFOS			92.800	93.591	100.9	70 - 130
D 54 13C8_PFOS	227393	233788			102.8	50 - 150
17 PFNA			100.00	105.01	105	70 - 130
D 56 13C9_PFNA	954829	952861			99.8	50 - 150
30 9Cl-PF3ONS			93.200	92.461	99.2	70 - 130
D 55 13C8_PFOSA	391661	487852			124.6	50 - 150
19 PFOSA			100.00	104.25	104.3	70 - 130
16 PFNS			96.000	94.648	98.6	70 - 130
D 65 13C2_8:2 FTS_2	132148	251725			190.5	50 - 150
3 8:2 FTS			95.800	83.758	87.4	70 - 130
10 PFDA			100.00	85.641	85.6	70 - 130
D 51 13C6_PFDA	824029	835250			101.4	50 - 150
6 N-MeFOSAA			100.00	105.46	105.5	70 - 130

Report Date: 29-Jul-2021 12:58:11 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072821-DOD.b\072821007.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	862293	1082323			125.5	50 - 150
9 PFDS			96.400	118.71	123.1	70 - 130
D 52 13C7_PFUdA	741490	774599			104.5	50 - 150
5 N-EtFOSAA			100.00	106.04	106	70 - 130
25 PFUdA			100.00	107.40	107.4	70 - 130
D 60 d5-EtFOSAA	830172	990051			119.3	50 - 150
D 61 d7-MeFOSE	145483	169991			116.8	50 - 150
32 MeFOSE			100.00	92.771	92.8	70 - 130
26 MeFOSA			100.00	89.816	89.8	70 - 130
D 57 d3-MeFOSA	60705	69861			115.1	50 - 150
31 11Cl-PF3OUDS			94.200	102.58	108.9	70 - 130
D 62 d9-EtFOSE	135458	134072			99	50 - 150
11 PFDoA			100.00	92.089	92.1	70 - 130
D 38 13C2_PFDoA	798101	792089			99.2	50 - 150
4 10:2 FTS			96.400	64.974	67.4	70 - 130
33 EtFOSE			100.00	106.89	106.9	70 - 130
D 59 d5-EtFOSA	51036	64663			126.7	50 - 150
27 EtFOSA			100.00	120.17	120.2	70 - 130
34 PFDOS			96.800	97.131	100.3	70 - 130
24 PFTrDA			100.00	106.08	106.1	70 - 130
23 PFTeDA			100.00	108.60	108.6	70 - 130
D 42 13C2_PFTeDA	864247	753810			87.2	50 - 150
35 PFHxDA			100.00	100.82	100.8	70 - 130
D 40 13C2_PFHxDA	383301	468595			122.3	50 - 150
36 PFODA			100.00	95.669	95.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072821-DOD.b\072821008.d
Injection Date: 28-Jul-2021 11:41:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	204.50	102.2	70 - 130
D 46 13C4_PFBA	1061058	1062184			100.1	50 - 150
D 50 13C5_PFPeA	1100903	1054691			95.8	50 - 150
21 PFPeA			200.00	202.20	101.1	70 - 130
D 44 13C3_PFBS	298962	305394			102.2	50 - 150
7 PFBS			176.80	181.21	102.5	70 - 130
1 4:2 FTS			186.80	193.66	103.7	70 - 130
D 63 13C2_4:2 FTS_2	261397	266016			101.8	50 - 150
D 49 13C5_PFHxA	935187	946315			101.2	50 - 150
15 PFHxA			200.00	195.61	97.8	70 - 130
22 PFPeS			187.60	202.96	108.2	70 - 130
28 GenX			400.00	421.46	105.4	70 - 130
D 66 13C3_GenX	740433	743186			100.4	50 - 150
D 47 13C4_PFHpA	988780	886730			89.7	50 - 150
13 PFHpA			200.00	218.16	109.1	70 - 130
D 45 13C3_PFHxS	279638	274659			98.2	50 - 150
14 PFHxS			182.00	178.42	98	70 - 130
29 ADONA			188.40	192.43	102.1	70 - 130
D 64 13C2_6:2 FTS_2	250200	241155			96.4	50 - 150
2 6:2 FTS			189.60	195.23	103	70 - 130
20 PFOA			200.00	219.05	109.5	70 - 130
D 53 13C8_PFOA	974681	929622			95.4	50 - 150
12 PFHpS			190.40	196.83	103.4	70 - 130
18 PFOS			185.60	165.67	89.3	70 - 130
D 54 13C8_PFOS	233788	230083			98.4	50 - 150
17 PFNA			200.00	201.42	100.7	70 - 130
D 56 13C9_PFNA	952861	997934			104.7	50 - 150
30 9Cl-PF3ONS			186.40	191.53	102.8	70 - 130
D 55 13C8_PFOSA	487852	435006			89.2	50 - 150
19 PFOSA			200.00	210.13	105.1	70 - 130
16 PFNS			192.00	149.61	77.9	70 - 130
D 65 13C2_8:2 FTS_2	251725	174614			69.4	50 - 150
3 8:2 FTS			191.60	217.55	113.5	70 - 130
10 PFDA			200.00	175.08	87.5	70 - 130
D 51 13C6_PFDA	835250	896669			107.4	50 - 150
6 N-MeFOSAA			200.00	204.71	102.4	70 - 130

Report Date: 29-Jul-2021 12:58:13 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072821-DOD.b\072821008.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1082323	1171101			108.2	50 - 150
9 PFDS			192.80	187.00	97	70 - 130
D 52 13C7_PFUdA	774599	701762			90.6	50 - 150
5 N-EtFOSAA			200.00	210.38	105.2	70 - 130
25 PFUdA			200.00	210.34	105.2	70 - 130
D 60 d5-EtFOSAA	990051	1048797			105.9	50 - 150
D 61 d7-MeFOSE	169991	144515			85	50 - 150
32 MeFOSE			200.00	223.98	112	70 - 130
26 MeFOSA			200.00	193.01	96.5	70 - 130
D 57 d3-MeFOSA	69861	68579			98.2	50 - 150
31 11Cl-PF3OUDS			188.40	203.61	108.1	70 - 130
D 62 d9-EtFOSE	134072	148831			111	50 - 150
11 PFDoA			200.00	180.48	90.2	70 - 130
D 38 13C2_PFDoA	792089	790735			99.8	50 - 150
4 10:2 FTS			192.80	194.13	100.7	70 - 130
33 EtFOSE			200.00	226.28	113.1	70 - 130
D 59 d5-EtFOSA	64663	61528			95.2	50 - 150
27 EtFOSA			200.00	185.18	92.6	70 - 130
34 PFDOS			193.60	198.26	102.4	70 - 130
24 PFTrDA			200.00	185.68	92.8	70 - 130
23 PFTeDA			200.00	194.33	97.2	70 - 130
D 42 13C2_PFTeDA	753810	768719			102	50 - 150
35 PFHxDA			200.00	210.99	105.5	70 - 130
D 40 13C2_PFHxDA	468595	433766			92.6	50 - 150
36 PFODA			200.00	188.46	94.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072821-DOD.b\072821052.d
Injection Date: 28-Jul-2021 19:27:22 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 42
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	913.04	91.3	70 - 130
D 46 13C4_PFBA	1061058	1016180			95.8	50 - 150
D 50 13C5_PFPeA	1100903	979929			89	50 - 150
21 PFPeA			1000.00	979.00	97.9	70 - 130
D 44 13C3_PFBS	298962	290247			97.1	50 - 150
7 PFBS			884.00	746.19	84.4	70 - 130
1 4:2 FTS			934.00	1024.41	109.7	70 - 130
D 63 13C2_4:2 FTS_2	261397	207135			79.2	50 - 150
D 49 13C5_PFHxA	935187	863574			92.3	50 - 150
15 PFHxA			1000.00	945.54	94.6	70 - 130
22 PFPeS			938.00	751.27	80.1	70 - 130
28 GenX			2000.00	2080.25	104	70 - 130
D 66 13C3_GenX	740433	602367			81.4	50 - 150
D 47 13C4_PFHpA	988780	789392			79.8	50 - 150
13 PFHpA			1000.00	1085.90	108.6	70 - 130
D 45 13C3_PFHxS	279638	263467			94.2	50 - 150
14 PFHxS			910.00	773.82	85	70 - 130
29 ADONA			942.00	894.04	94.9	70 - 130
D 64 13C2_6:2 FTS_2	250200	203815			81.5	50 - 150
2 6:2 FTS			948.00	895.96	94.5	70 - 130
20 PFOA			1000.00	922.80	92.3	70 - 130
D 53 13C8_PFOA	974681	902181			92.6	50 - 150
12 PFHpS			952.00	926.86	97.4	70 - 130
18 PFOS			928.00	821.61	88.5	70 - 130
D 54 13C8_PFOS	233788	222151			95	50 - 150
17 PFNA			1000.00	771.49	77.1	70 - 130
D 56 13C9_PFNA	952861	939235			98.6	50 - 150
30 9Cl-PF3ONS			932.00	848.18	91	70 - 130
D 55 13C8_PFOSA	487852	361842			74.2	50 - 150
19 PFOSA			1000.00	1101.86	110.2	70 - 130
16 PFNS			960.00	879.57	91.6	70 - 130
D 65 13C2_8:2 FTS_2	251725	170719			67.8	50 - 150
3 8:2 FTS			958.00	1217.38	127.1	70 - 130
10 PFDA			1000.00	884.52	88.5	70 - 130
D 51 13C6_PFDA	835250	769999			92.2	50 - 150
6 N-MeFOSAA			1000.00	1129.99	113	70 - 130

Report Date: 29-Jul-2021 12:58:16 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072821-DOD.b\072821052.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1082323	929295			85.9	50 - 150
9 PFDS			964.00	927.40	96.2	70 - 130
D 52 13C7_PFUdA	774599	737619			95.2	50 - 150
5 N-EtFOSAA			1000.00	991.71	99.2	70 - 130
25 PFUdA			1000.00	881.51	88.2	70 - 130
D 60 d5-EtFOSAA	990051	903980			91.3	50 - 150
D 61 d7-MeFOSE	169991	141058			83	50 - 150
32 MeFOSE			1000.00	916.08	91.6	70 - 130
26 MeFOSA			1000.00	1214.51	121.5	70 - 130
D 57 d3-MeFOSA	69861	48589			69.6	50 - 150
31 11Cl-PF3OUDS			942.00	839.20	89.1	70 - 130
D 62 d9-EtFOSE	134072	128072			95.5	50 - 150
11 PFDoA			1000.00	899.57	90	70 - 130
D 38 13C2_PFDoA	792089	694055			87.6	50 - 150
4 10:2 FTS			964.00	853.00	88.5	70 - 130
33 EtFOSE			1000.00	1064.76	106.5	70 - 130
D 59 d5-EtFOSA	64663	52815			81.7	50 - 150
27 EtFOSA			1000.00	917.48	91.7	70 - 130
34 PFDOS			968.00	914.81	94.5	70 - 130
24 PFTrDA			1000.00	853.60	85.4	70 - 130
23 PFTeDA			1000.00	946.53	94.7	70 - 130
D 42 13C2_PFTeDA	753810	645507			85.6	50 - 150
35 PFHxDA			1000.00	947.82	94.8	70 - 130
D 40 13C2_PFHxDA	468595	362790			77.4	50 - 150
36 PFODA			1000.00	1008.85	100.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072821-DOD.b\072821068.d
Injection Date: 28-Jul-2021 22:17:04 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 57
Sample Info: CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	959.15	95.9	70 - 130
D 46 13C4_PFBA	1061058	1201045			113.2	50 - 150
D 50 13C5_PFPeA	1100903	1160317			105.4	50 - 150
21 PFPeA			1000.00	1043.20	104.3	70 - 130
D 44 13C3_PFBS	298962	359586			120.3	50 - 150
7 PFBS			884.00	836.52	94.6	70 - 130
1 4:2 FTS			934.00	992.41	106.3	70 - 130
D 63 13C2_4:2 FTS_2	261397	282354			108	50 - 150
D 49 13C5_PFHxA	935187	1107029			118.4	50 - 150
15 PFHxA			1000.00	857.66	85.8	70 - 130
22 PFPeS			938.00	874.90	93.3	70 - 130
28 GenX			2000.00	2149.86	107.5	70 - 130
D 66 13C3_GenX	740433	695644			94	50 - 150
D 47 13C4_PFHpA	988780	1118186			113.1	50 - 150
13 PFHpA			1000.00	931.85	93.2	70 - 130
D 45 13C3_PFHxS	279638	330341			118.1	50 - 150
14 PFHxS			910.00	753.08	82.8	70 - 130
29 ADONA			942.00	840.51	89.2	70 - 130
D 64 13C2_6:2 FTS_2	250200	277329			110.8	50 - 150
2 6:2 FTS			948.00	998.78	105.4	70 - 130
20 PFOA			1000.00	923.77	92.4	70 - 130
D 53 13C8_PFOA	974681	1101983			113.1	50 - 150
12 PFHpS			952.00	837.59	88	70 - 130
18 PFOS			928.00	870.16	93.8	70 - 130
D 54 13C8_PFOS	233788	276349			118.2	50 - 150
17 PFNA			1000.00	879.70	88	70 - 130
D 56 13C9_PFNA	952861	1100647			115.5	50 - 150
30 9Cl-PF3ONS			932.00	841.18	90.3	70 - 130
D 55 13C8_PFOSA	487852	449563			92.2	50 - 150
19 PFOSA			1000.00	1118.01	111.8	70 - 130
16 PFNS			960.00	919.45	95.8	70 - 130
D 65 13C2_8:2 FTS_2	251725	211521			84	50 - 150
3 8:2 FTS			958.00	1239.23	129.4	70 - 130
10 PFDA			1000.00	801.67	80.2	70 - 130
D 51 13C6_PFDA	835250	1088240			130.3	50 - 150
6 N-MeFOSAA			1000.00	1063.29	106.3	70 - 130

Report Date: 29-Jul-2021 12:58:09 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\072821-DOD.b\072821068.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1082323	1170020			108.1	50 - 150
9 PFDS			964.00	888.01	92.1	70 - 130
D 52 13C7_PFUdA	774599	932472			120.4	50 - 150
5 N-EtFOSAA			1000.00	902.73	90.3	70 - 130
25 PFUdA			1000.00	807.68	80.8	70 - 130
D 60 d5-EtFOSAA	990051	1156741			116.8	50 - 150
D 61 d7-MeFOSE	169991	154335			90.8	50 - 150
32 MeFOSE			1000.00	941.84	94.2	70 - 130
26 MeFOSA			1000.00	1099.78	110	70 - 130
D 57 d3-MeFOSA	69861	69576			99.6	50 - 150
31 11Cl-PF3OUDS			942.00	810.94	86.1	70 - 130
D 62 d9-EtFOSE	134072	167371			124.8	50 - 150
11 PFDoA			1000.00	979.98	98	70 - 130
D 38 13C2_PFDoA	792089	834538			105.4	50 - 150
4 10:2 FTS			964.00	792.29	82.2	70 - 130
33 EtFOSE			1000.00	894.80	89.5	70 - 130
D 59 d5-EtFOSA	64663	59890			92.6	50 - 150
27 EtFOSA			1000.00	1069.25	106.9	70 - 130
34 PFDOS			968.00	878.55	90.8	70 - 130
24 PFTrDA			1000.00	894.93	89.5	70 - 130
23 PFTeDA			1000.00	897.07	89.7	70 - 130
D 42 13C2_PFTeDA	753810	803874			106.6	50 - 150
35 PFHxDA			1000.00	942.33	94.2	70 - 130
D 40 13C2_PFHxDA	468595	447031			95.4	50 - 150
36 PFODA			1000.00	1028.68	102.9	70 - 130

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47	072221B017.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24	072221B018.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59	072221B019.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35	072221B020.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15	072221B021.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49	072221B022.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27	072221B023.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08	072221B024.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44	072221B025.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22	072221B026.d	ICal					Analytes	L-10	1.00		
11	ID IBLK A	23-Jul-2021 01:04:03	072221B027.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1577	23-Jul-2021 01:14:35	072221B028.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK STD_SVLC-1562	23-Jul-2021 01:25:08	072221B029.d	CheckStd					IsomerCheck	Smp	1.00		

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.613	3.212	3.254	3.512	3.519	3.439	3.450	3.423	3.453	3.406	3.428	3.170-3.867	0.11611	1.759
1 4:2 FTS	0.893	1.026	1.353	1.771	1.666	1.969	1.808	1.978	1.879	1.975	1.631	0.377-2.954	0.42965	0.833
15 PFHxA	14.031	13.128	25.058	19.778	19.670	18.684	18.332	17.826	18.587	16.968	18.206	10.298-29.041	3.12369	9.835
22 PFPeS	3.236	2.899	3.017	3.131	2.741	3.011	2.863	2.861	2.937	3.054	2.975	2.313-3.168	0.14244	1.370
28 GenX	0.743	0.771	0.796	0.756	0.792	0.778	0.802	0.762	0.801	0.801	0.780	0.730-0.853	0.02047	0.396
13 PFHpA	3.729	3.626	4.038	3.688	3.691	3.699	3.761	3.747	3.689	3.615	3.728	3.329-4.052	0.12053	1.845
14 PFHxS	3.013	2.850	2.943	2.837	3.053	3.270	3.250	3.163	2.987	3.051	3.041	2.597-3.508	0.15168	1.526
29 ADONA	3.008	2.930	3.121	3.020	3.078	3.024	3.133	2.998	3.054	2.887	3.025	2.823-3.332	0.08492	1.539
2 6:2 FTS	Disabled	1.603	1.602	1.986	1.824	1.966	1.821	1.888	1.888	1.794	1.819	1.414-2.233	0.13649	0.912
20 PFOA	2.682	3.014	2.640	3.017	2.883	2.685	2.898	2.853	3.040	2.880	2.859	2.421-3.344	0.15393	1.441
12 PFHpS	2.754	3.053	3.578	3.274	3.062	3.160	3.143	2.970	3.104	2.957	3.105	2.405-3.718	0.21869	1.531
18 PFOS	3.458	3.004	3.025	3.387	3.415	3.427	3.449	3.289	3.288	3.372	3.311	2.828-4.001	0.19534	1.707
17 PFNA	7.315	6.232	6.097	6.165	6.365	6.364	6.419	6.205	6.468	6.017	6.364	5.200-7.529	0.38823	3.182
19 PFOSA	69.990	52.330	34.668	27.726	28.473	32.713	32.270	32.526	30.906	30.582	37.218	-13.074-70.020	13.84911	14.236
16 PFNS	2.370	2.991	3.315	2.530	2.513	2.612	2.708	2.741	2.805	2.756	2.734	1.730-3.295	0.26096	1.256
10 PFDA	10.069	14.382	13.280	14.604	13.356	13.003	13.142	12.930	12.566	12.724	13.005	9.699-17.012	1.21871	6.678
3 8:2 FTS	1.577	1.517	1.982	1.945	1.968	2.064	1.988	1.857	1.848	2.011	1.875	1.329-2.606	0.21297	0.984
6 N-MeFOSAA	1.729	1.368	1.209	1.297	1.452	1.386	1.421	1.374	1.370	1.373	1.397	1.020-1.883	0.14393	0.726
9 PFDS	2.989	2.117	3.337	2.261	2.618	2.535	2.720	Disabled	Disabled	Disabled	2.653	1.432-3.803	0.39506	1.309
25 PFUdA	10.186	13.794	12.360	14.609	14.700	13.886	13.538	13.848	14.326	13.899	13.514	10.475-18.924	1.40814	7.350
5 N-EtFOSAA	3.441	1.648	1.914	1.385	1.447	1.704	1.510	1.704	1.566	1.711	1.803	-0.278-3.172	0.57502	0.723
26 MeFOSA	0.872	1.060	0.983	1.222	1.013	0.982	0.996	1.118	1.006	1.027	1.027	0.729-1.296	0.09451	0.506
27 EtFOSA	0.899	1.138	0.928	0.907	0.893	1.061	0.960	0.948	1.053	0.994	0.978	0.635-1.150	0.08599	0.446
11 PFDoA	17.404	11.511	9.422	10.673	10.018	10.373	10.714	10.193	10.249	10.510	11.106	3.257-16.778	2.25341	5.009
4 10:2 FTS	3.256	1.775	3.770	3.333	3.196	3.666	3.304	3.478	3.467	3.512	3.275	1.509-4.882	0.56222	1.598
34 PFDOS	3.580	2.776	3.093	2.779	3.093	3.074	2.931	3.077	3.134	3.223	3.076	2.399-3.786	0.23104	1.546
24 PFTrDA	8.158	8.335	8.011	7.623	8.030	7.860	7.857	8.081	8.143	7.615	7.971	7.303-8.756	0.24220	4.015
23 PFTeDA	11.812	12.137	10.917	11.359	11.304	11.364	11.381	11.748	11.166	10.899	11.408	10.099-12.508	0.40138	5.652
35 PFHxDA	11.601	11.103	9.130	10.834	10.453	10.404	10.497	10.396	10.280	10.369	10.506	8.526-12.379	0.64207	5.226
36 PFODA	14.446	12.290	13.663	13.457	13.351	13.158	13.254	13.055	12.911	12.657	13.224	11.594-15.107	0.58536	6.675

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	547	611	600	573	563	559	541	472	515	533	Avg:A Wt:C2	551		RSD=7.3	
	99.2	110.8	108.8	103.9	102.1	101.4	98	85.7	93.5	96.6	Org:N Dep:R				
8 PFBA	1.016419	1.005008	0.969197	0.979269	0.877172	0.939182	0.971835	0.977893	0.961911	0.944904	Avg:A Wt:C2	0.964279		RSD=4.0	
	105.4	104.2	100.5	101.6	91	97.4	100.8	101.4	99.8	98	Org:N Dep:R				
D 50 13C5_PFPeA	511	576	552	532	524	535	519	439	481	495	Avg:A Wt:C2	516		RSD=7.4	
	99	111.5	106.8	103	101.4	103.7	100.6	85	93.2	95.8	Org:N Dep:R				
21 PFPeA	1.142375	1.109055	1.059827	1.048168	0.941090	1.070071	1.082590	1.082854	1.057405	1.019366	Avg:A Wt:C2	1.061280		RSD=5.1	
	107.6	104.5	99.9	98.8	88.7	100.8	102	102	99.6	96.1	Org:N Dep:R				
D 44 13C3_PFBS	169	196	188	179	169	176	182	140	164	172	Avg:A Wt:C2	174		RSD=8.8	
	97.1	113.1	108.2	103	97.5	101.6	105.1	80.7	94.3	99.3	Org:N Dep:R				
7 PFBS	1.381732	1.255550	1.302964	1.288405	1.228942	1.263662	1.236027	1.381835	1.313330	1.276973	Avg:A Wt:C2	1.292942		RSD=4.2	
	106.9	97.1	100.8	99.6	95.1	97.7	95.6	106.9	101.6	98.8	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 63 13C2_4:2 FTS_2	20.0656	22.1628	21.5058	21.9484	18.0392	19.9862	19.3008	17.9994	18.5994	19.7510	Avg:A Wt:C2	19.9359		RSD=7.7	
	100.7	111.2	107.9	110.1	90.5	100.3	96.8	90.3	93.3	99.1	Org:N Dep:R				
1 4:2 FTS	1.969984	2.018352	1.754668	1.950750	2.148070	2.269259	2.125729	1.914512	1.994807	2.055682	Avg:A Wt:C2	2.020181		RSD=7.0	
	97.5	99.9	86.9	96.6	106.3	112.3	105.2	94.8	98.7	101.8	Org:N Dep:R				
D 49 13C5_PFHxA	606	659	647	645	600	624	619	499	541	589	Avg:A Wt:C2	603		RSD=8.3	
	100.5	109.3	107.3	107	99.5	103.5	102.6	82.8	89.7	97.7	Org:N Dep:R				
15 PFHxA	1.136456	0.970051	1.105495	1.009838	0.939058	1.016957	0.974863	1.065629	1.065952	0.937937	Avg:A Wt:C2	1.022224		RSD=6.8	
	111.2	94.9	108.1	98.8	91.9	99.5	95.4	104.2	104.3	91.8	Org:N Dep:R				
22 PFPeS	1.040990	0.872468	0.901285	0.964537	0.925005	0.938154	0.879388	0.995855	0.895449	0.933551	Avg:A Wt:C2	0.934668		RSD=5.7	
	111.4	93.3	96.4	103.2	99	100.4	94.1	106.5	95.8	99.9	Org:N Dep:R				
28 GenX	0.694514	0.706749	0.711356	0.656646	0.698709	0.700657	0.679510	0.647892	0.680289	0.709347	Avg:A Wt:C2	0.688567		RSD=3.2	
	100.9	102.6	103.3	95.4	101.5	101.8	98.7	94.1	98.8	103	Org:N Dep:R				
D 66 13C3_GenX	212	240	236	225	200	208	215	190	206	198	Avg:A Wt:C2	213		RSD=7.7	
	99.6	112.8	110.8	105.5	94	97.4	100.7	89.4	96.8	93	Org:N Dep:R				
13 PFHpA	1.286509	1.178728	1.131168	1.130533	1.008084	1.081766	1.064985	1.080324	1.138289	1.113823	Avg:A Wt:C2	1.121421		RSD=6.7	
	114.7	105.1	100.9	100.8	89.9	96.5	95	96.3	101.5	99.3	Org:N Dep:R				
D 47 13C4_PFHpA	492	543	527	513	483	474	503	425	434	456	Avg:A Wt:C2	485		RSD=8.0	
	101.4	112	108.7	105.8	99.5	97.7	103.7	87.6	89.5	94	Org:N Dep:R				
D 45 13C3_PFHxS	146	153	151	151	138	146	142	109	122	130	Avg:A Wt:C2	139		RSD=10.4	
	105.5	110.2	108.9	108.6	99.1	105.4	102.5	78.6	87.7	93.5	Org:N Dep:R				
14 PFHxS	1.121227	1.085313	1.008377	1.043022	1.013859	1.034529	1.038313	1.150037	1.122995	1.090854	Avg:A Wt:C2	1.070853		RSD=4.7	
	104.7	101.4	94.2	97.4	94.7	96.6	97	107.4	104.9	101.9	Org:N Dep:R				
29 ADONA	6.792623	6.160722	6.316662	5.993784	5.749857	5.987295	6.069684	6.511944	6.645386	6.159051	Avg:A Wt:C2	6.238701		RSD=5.2	
	108.9	98.8	101.2	96.1	92.2	96	97.3	104.4	106.5	98.7	Org:N Dep:R				
2 6:2 FTS	Disabled	3.574242	3.490726	2.866088	2.538598	2.523102	2.760954	2.660239	2.538669	2.431365	Avg:A Wt:C2	2.820442		RSD=15.1	
	Disabled	126.7	123.8	101.6	90	89.5	97.9	94.3	90	86.2	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	16.1862	17.3062	18.3352	16.0446	15.4642	17.2064	13.8766	13.1698	14.7236	14.5148	Avg:A Wt:C2	15.6828		RSD=10.5	
	103.2	110.4	116.9	102.3	98.6	109.7	88.5	84	93.9	92.6	Org:N Dep:R				
D 53 13C8_PFOA	507	557	550	516	539	488	514	399	425	452	Avg:A Wt:C2	495		RSD=10.8	
	102.6	112.6	111.2	104.2	108.9	98.6	103.9	80.6	85.8	91.5	Org:N Dep:R				
20 PFOA	1.015673	0.954395	0.968422	0.961601	0.805359	0.967654	0.914120	0.960996	1.022079	0.924109	Avg:A Wt:C2	0.949441		RSD=6.4	
	107	100.5	102	101.3	84.8	101.9	96.3	101.2	107.7	97.3	Org:N Dep:R				
12 PFHpS	1.072621	0.975748	0.993382	0.911480	0.941168	0.969310	0.970020	1.036016	0.992607	0.945489	Avg:A Wt:C2	0.980784		RSD=4.8	
	109.4	99.5	101.3	92.9	96	98.8	98.9	105.6	101.2	96.4	Org:N Dep:R				
D 54 13C8_PFOS	137	158	156	136	140	145	139	112	132	139	Avg:A Wt:C2	139		RSD=9.3	
	98.1	113.4	112	97.7	100.5	103.9	99.5	80.1	94.7	100.1	Org:N Dep:R				
18 PFOS	1.578661	1.256972	1.000883	1.166541	1.036035	1.115945	1.144211	1.206493	1.103505	1.134872	Ln:A Wt:C2	1.093775	19.2285	R^2=0.992	
	106.4	96	82	102.9	92.8	101.1	104.2	110.1	100.8	103.7	Org:N Dep:R			RSE=8.5	
D 56 13C9_PFNA	625	675	643	627	619	632	609	526	549	585	Avg:A Wt:C2	609		RSD=7.3	
	102.7	110.9	105.5	102.9	101.6	103.8	100	86.3	90.2	96.1	Org:N Dep:R				
17 PFNA	1.211027	1.087750	1.056915	1.012170	0.943876	1.098155	1.021197	1.020035	1.056310	1.027970	Avg:A Wt:C2	1.053541		RSD=6.7	
	114.9	103.2	100.3	96.1	89.6	104.2	96.9	96.8	100.3	97.6	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.688737	3.285706	3.460432	3.845645	3.154403	3.493060	3.522847	4.062284	3.824058	3.722494	Avg:A Wt:C2	3.605967		RSD=7.6	
	102.3	91.1	96	106.6	87.5	96.9	97.7	112.7	106	103.2	Org:N Dep:R				
D 55 13C8_PFOSA	275	295	290	270	250	293	260	229	250	259	Avg:A Wt:C2	267		RSD=8.1	
	103	110.6	108.5	101	93.6	109.7	97.4	85.6	93.5	97.1	Org:N Dep:R				
19 PFOSA	1.105052	1.151548	0.991587	1.047427	1.090677	0.984879	1.000929	1.088139	1.091422	1.131345	Avg:A Wt:C2	1.068300		RSD=5.5	
	103.4	107.8	92.8	98	102.1	92.2	93.7	101.9	102.2	105.9	Org:N Dep:R				
16 PFNS	0.885752	0.729123	0.814794	0.808249	0.682093	0.784107	0.795145	0.885268	0.800149	0.781390	Avg:A Wt:C2	0.796607		RSD=7.8	
	111.2	91.5	102.3	101.5	85.6	98.4	99.8	111.1	100.4	98.1	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	17.8008	19.2204	19.3660	17.3986	14.4364	17.0066	16.8702	15.2824	16.6032	15.2764	Avg:A Wt:C2	16.9261		RSD=9.6	
	105.2	113.6	114.4	102.8	85.3	100.5	99.7	90.3	98.1	90.3	Org:N Dep:R				
10 PFDA	1.121987	1.091406	1.113959	1.087910	0.978715	1.120213	1.017481	1.097764	1.007865	1.020853	Avg:A Wt:C2	1.065815		RSD=5.0	
	105.3	102.4	104.5	102.1	91.8	105.1	95.5	103	94.6	95.8	Org:N Dep:R				
D 51 13C6_PFDA	603	658	666	609	591	587	608	491	532	555	Avg:A Wt:C2	590		RSD=9.1	
	102.3	111.5	112.9	103.3	100.1	99.4	103.1	83.2	90.2	94	Org:N Dep:R				
3 8:2 FTS	2.236535	2.068088	2.664043	2.264118	2.622474	2.487061	2.318105	2.066044	2.035501	2.214282	Avg:A Wt:C2	2.297625		RSD=9.9	
	97.3	90	115.9	98.5	114.1	108.2	100.9	89.9	88.6	96.4	Org:N Dep:R				
D 58 d3-MeFOSAA	131	136	148	123	120	139	127	123	148	141	Avg:A Wt:C2	133		RSD=7.6	
	97.8	102.1	110.6	92.2	90.2	104.2	95	92	110.6	105.3	Org:N Dep:R				
6 N-MeFOSAA	0.982031	0.877342	0.661060	0.696446	0.771956	0.772451	0.801981	0.743534	0.722426	0.784505	Avg:A Wt:C2	0.781373		RSD=11.8	
	125.7	112.3	84.6	89.1	98.8	98.9	102.6	95.2	92.5	100.4	Org:N Dep:R				
9 PFDS	1.094012	0.676181	0.766211	0.756593	0.723345	0.739213	0.781721	Disabled	Disabled	Disabled	Ln:A Wt:C	0.759859	5.436781	R^2=0.997	
	129.1	81.6	97.1	98.1	94.5	96.9	102.7	Disabled	Disabled	Disabled	Org:N Dep:R			RSE=15.8	
D 52 13C7_PFUdA	705	716	747	634	708	721	634	527	562	617	Avg:A Wt:C2	657		RSD=11.3	
	107.3	108.9	113.8	96.5	107.7	109.7	96.5	80.2	85.5	93.9	Org:N Dep:R				
D 60 d5-EtFOSAA	120	132	131	120	104	123	113	93.8996	105	107	Avg:A Wt:C2	115		RSD=10.8	
	104	115	113.8	104.8	90.7	106.8	98.7	81.7	91.5	92.8	Org:N Dep:R				
25 PFUdA	0.821472	0.962352	0.858297	0.977931	0.780823	0.847434	0.879772	0.930643	0.924546	0.862079	Avg:A Wt:C2	0.884535		RSD=7.1	
	92.9	108.8	97	110.6	88.3	95.8	99.5	105.2	104.5	97.5	Org:N Dep:R				
5 N-EtFOSAA	1.198909	0.961713	0.892920	0.867371	0.965256	1.028107	1.003115	1.013985	0.973630	1.016873	Avg:A Wt:C2	0.992188		RSD=9.1	
	120.8	96.9	90	87.4	97.3	103.6	101.1	102.2	98.1	102.5	Org:N Dep:R				
D 61 d7-MeFOSE	72.5780	83.3930	78.7110	74.4230	68.2950	72.5570	78.6500	69.2240	75.2560	78.0920	Avg:A Wt:C2	75.1179		RSD=6.2	
	96.6	111	104.8	99.1	90.9	96.6	104.7	92.2	100.2	104	Org:N Dep:R				
32 MeFOSE	1.199537	1.109925	1.261958	1.027478	1.123801	1.247495	1.098197	1.108855	1.089627	1.163942	Avg:A Wt:C2	1.143082		RSD=6.5	
	104.9	97.1	110.4	89.9	98.3	109.1	96.1	97	95.3	101.8	Org:N Dep:R				
D 57 d3-MeFOSA	45.9100	50.8680	49.2480	47.4650	40.7770	50.6270	47.8650	48.3890	57.2100	53.6180	Avg:A Wt:C2	49.1977		RSD=9.0	
	93.3	103.4	100.1	96.5	82.9	102.9	97.3	98.4	116.3	109	Org:N Dep:R				
26 MeFOSA	0.715313	0.916097	1.160453	1.107427	1.070285	1.011565	1.028426	0.962248	0.886511	0.982414	Avg:A Wt:C2	0.984074		RSD=12.8	
	72.7	93.1	117.9	112.5	108.8	102.8	104.5	97.8	90.1	99.8	Org:N Dep:R				
31 11Cl-PF3OUDS	3.404397	3.058323	3.010505	3.467293	3.029313	3.086520	3.133430	3.605481	3.180048	3.207502	Avg:A Wt:C2	3.218281		RSD=6.4	
	105.8	95	93.5	107.7	94.1	95.9	97.4	112	98.8	99.7	Org:N Dep:R				
D 62 d9-EtFOSE	83.2060	83.3240	80.1150	80.0420	68.4520	79.8740	80.7840	71.5570	74.6630	80.7740	Avg:A Wt:C2	78.2791		RSD=6.4	
	106.3	106.4	102.3	102.3	87.4	102	103.2	91.4	95.4	103.2	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	1.277071	1.196774	1.459964	1.175608	1.200359	1.117648	1.066810	1.096601	1.155936	1.168089	Avg:A Wt:C2	1.191486		RSD=9.3	
	107.2	100.4	122.5	98.7	100.7	93.8	89.5	92	97	98	Org:N Dep:R				
D 59 d5-EtFOSA	36.8070	47.1340	45.7690	40.0380	38.0250	41.1440	44.9320	38.0390	38.8640	44.7100	Avg:A Wt:C2	41.5462		RSD=9.1	
	88.6	113.4	110.2	96.4	91.5	99	108.1	91.6	93.5	107.6	Org:N Dep:R				
27 EtFOSA	1.488847	1.335978	1.069938	0.935911	1.094701	1.164738	0.992433	1.043006	1.161999	1.009442	Ln:A Wt:C2	1.042367	22.4410	R^2=0.991	
	99.8	106.6	91.9	85.5	102.9	110.7	94.8	99.8	111.3	96.7	Org:N Dep:R			RSE=8.7	
D 38 13C2_PFDoA	751	764	824	766	745	775	783	624	709	683	Avg:A Wt:C2	742		RSD=7.6	
	101.1	103	111	103.2	100.4	104.4	105.4	84.1	95.5	92.1	Org:N Dep:R				
11 PFDoA	1.203071	1.047758	1.013770	1.051741	0.942380	0.997848	1.014622	0.951126	0.927553	0.979381	Avg:A Wt:C2	1.012925		RSD=7.8	
	118.8	103.4	100.1	103.8	93	98.5	100.2	93.9	91.6	96.7	Org:N Dep:R				
4 10:2 FTS	3.962711	3.502179	5.322242	4.214461	4.683226	4.379310	4.094197	3.691728	3.624328	3.941042	Avg:A Wt:C2	4.141542		RSD=13.2	
	95.7	84.6	128.5	101.8	113.1	105.7	98.9	89.1	87.5	95.2	Org:N Dep:R				
34 PFDOS	0.961646	0.688365	0.788200	0.850372	0.773104	0.799596	0.843411	0.921802	0.879031	0.871188	Avg:A Wt:C2	0.837672		RSD=9.4	
	114.8	82.2	94.1	101.5	92.3	95.5	100.7	110	104.9	104	Org:N Dep:R				
24 PFTrDA	0.865096	0.889027	0.795691	0.800220	0.751036	0.797844	0.728467	0.822240	0.790279	0.792006	Avg:A Wt:C2	0.803191		RSD=5.9	
	107.7	110.7	99.1	99.6	93.5	99.3	90.7	102.4	98.4	98.6	Org:N Dep:R				
D 42 13C2_PFTeDA	857	906	910	886	846	885	881	766	853	960	Avg:A Wt:C2	875		RSD=5.8	
	98	103.5	104	101.2	96.7	101.1	100.7	87.6	97.4	109.7	Org:N Dep:R				
23 PFTeDA	0.875457	0.856690	0.821765	0.825215	0.748464	0.812728	0.806877	0.795894	0.788051	0.724492	Avg:A Wt:C2	0.805563		RSD=5.6	
	108.7	106.3	102	102.4	92.9	100.9	100.2	98.8	97.8	89.9	Org:N Dep:R				
D 40 13C2_PFHxDA	814	874	870	879	769	848	862	733	852	871	Avg:A Wt:C2	837		RSD=5.9	
	97.2	104.4	103.9	105	91.8	101.3	102.9	87.6	101.8	104	Org:N Dep:R				
35 PFHxDA	0.733171	0.654204	0.619485	0.586008	0.582836	0.580047	0.560434	0.571437	0.543605	0.544164	Avg:A Wt:C2	0.597539		RSD=9.8	
	122.7	109.5	103.7	98.1	97.5	97.1	93.8	95.6	91	91.1	Org:N Dep:R				
36 PFODA	1.009160	0.905721	0.933082	0.896012	0.910934	0.899798	0.900502	0.921096	0.877661	0.858878	Avg:A Wt:C2	0.911284		RSD=4.4	
	110.7	99.4	102.4	98.3	100	98.7	98.8	101.1	96.3	94.2	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	664657	698745	719376	661837	592352	636307	624788	525891	605736	631298	1.28
* 39 13C2_PFHxA	625107	644196	668847	652725	582381	657478	598734	516865	562139	590710	1.41
* 41 13C2_PFOA	529331	570233	575643	538819	516348	530663	516445	442186	454391	469502	2.99
* 43 13C3_PFBA	495400	543881	539827	529552	474184	502696	494309	440120	466568	479357	0.82
* 48 13C4_PFOS	137646	151522	150490	136409	126954	145871	137216	109022	123534	136345	0.23

13C2_PFDA ((|631298 - 664657| / (631298 + 664657)) / 2) * 100 = 1.29
13C2_PFHxA ((|590710 - 625107| / (590710 + 625107)) / 2) * 100 = 1.41
13C2_PFOA ((|469502 - 529331| / (469502 + 529331)) / 2) * 100 = 2.99
13C3_PFBA ((|479357 - 495400| / (479357 + 495400)) / 2) * 100 = 0.82
13C4_PFOS ((|136345 - 137646| / (136345 + 137646)) / 2) * 100 = 0.24

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	546861	611000	599976	573156	563032	559024	540622	472283	515476	532517	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	27792	61406	116299	280637	493876	1050051	2626976	4618423	7437630	10063548	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	511058	575526	551519	531930	523546	535244	519236	438943	481475	494900	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	29191	63829	116903	278776	492704	1145498	2810598	4753112	7636713	10089689	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	168570	196377	187768	178777	169277	176333	182475	140086	163595	172404	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	10295	21796	43255	101809	183900	393955	996905	1711209	2848967	3892346	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	100328	110814	107529	109742	90196	99931	96504	89997	92997	98755	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	1846	4178	7049	19995	36192	84721	191602	321857	519802	758441	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	606218	659089	647271	645478	600114	624153	618656	499241	541057	589408	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	625107	644196	668847	652725	582381	657478	598734	516865	562139	590710	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	34447	63935	143111	325914	563542	1269473	3015523	5320058	8651109	11056552	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	8230	16071	31748	80873	146874	310342	752587	1308560	2061129	3019383	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	14733	33958	67171	147510	279651	581605	1457690	2465817	4208040	5617453	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1060670	1201204	1180333	1123208	1000599	1037606	1072603	951477	1030944	989899	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	31646	64035	119317	290119	486690	1024742	2677910	4590070	7410037	10153232	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	491967	543255	527406	513243	482787	473643	502901	424879	433987	455783	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	146484	153093	151195	150796	137682	146445	142331	109122	121799	129872	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	7473	15120	27748	71564	127027	275733	672418	1141998	1867043	2578419	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	46865	88846	179931	425708	745736	1651909	4068989	6693818	11436842	15069894	
2 6:2 FTS	Disabled	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	Disabled	5864	12135	21797	37216	82312	181602	332130	531520	669113	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	80931	86531	91676	80223	77321	86032	69383	65849	73618	72574	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	529331	570233	575643	538819	516348	530663	516445	442186	454391	469502	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	507486	557306	550354	515742	538966	487751	513973	399015	424537	452495	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	25772	53189	106595	247969	434061	943948	2349164	3834519	6508653	8363090	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	7479	14221	28597	65425	123362	270274	657184	1076256	1726431	2337970	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	136560	157938	156053	136027	139992	144663	138558	111576	131902	139484	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	137646	151522	150490	136409	126954	145871	137216	109022	123534	136345	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	10003	18423	28989	73628	134594	299625	735624	1249233	2026119	2937984	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	625469	675477	642980	626954	618881	632127	609273	525981	549315	585461	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	37873	73475	135915	317292	584147	1388347	3110938	5365192	8703707	12036723	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	23474	48365	100658	243770	411563	941910	2274633	4224322	7051525	9678417	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	274883	295385	289667	269529	250019	292812	260109	228568	249606	259213	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	15188	34015	57446	141156	272690	576769	1301753	2487137	4086381	5865187	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	5806	11055	24413	52773	91668	217788	528834	948237	1519794	2092634	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	89004	96102	96830	86993	72182	85033	84351	76412	83016	76382	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	33854	71781	148329	331458	577932	1314178	3094369	5385157	8039433	11323896	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	664657	698745	719376	661837	592352	636307	624788	525891	605736	631298	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	603465	657693	665774	609348	590501	586575	608241	490557	531780	554629	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1907	3808	9885	18869	36269	81040	187322	302480	485646	648111	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	652831	681319	738360	615697	601725	695403	633865	614018	738160	702845	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	6411	11955	19524	42880	92901	214866	508348	913087	1599797	2205543	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	Disabled	Disabled	Disabled	#54
	7201	10295	23053	49606	97617	206174	522072	Disabled	Disabled	Disabled	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	704613	715580	747498	633789	707587	720614	633568	526954	561767	616790	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	597877	660852	654230	602499	521292	613448	567342	469498	525972	533502	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	28941	68864	128315	309901	552500	1221346	2786976	4904060	7790693	10634436	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7168	12711	23367	52259	100636	252276	569109	952128	1536307	2170015	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	72578	83393	78711	74423	68295	72557	78650	69224	75256	78092	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	4353	9256	19866	38234	76750	181029	431866	767594	1230014	1817891	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	45910	50868	49248	47465	40777	50627	47865	48389	57210	53618	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	1642	4660	11430	26282	43643	102425	246128	465622	760759	1053502	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	21897	45501	88510	222145	399483	841216	2044902	3789526	5926895	8428925	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	83206	83324	80115	80042	68452	79874	80784	71557	74663	80774	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	5313	9972	23393	47049	82167	178542	430906	784695	1294585	1887024	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	36807	47134	45769	40038	38025	41144	44932	38039	38864	44710	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2740	6297	9794	18736	41626	95844	222960	396749	677399	902643	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	750529	764375	823994	766014	745164	774776	782694	624240	709060	683408	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	45147	80088	167068	402824	702228	1546218	3970694	5937306	9865365	13386339	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3400	6489	19872	35343	65175	143592	332917	543874	870137	1160751	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	6356	10524	23813	55986	104765	223941	565609	995597	1683536	2352565	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	32464	67955	131129	306490	559645	1236301	2850833	5132753	8405331	10825266	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	857358	906057	909992	885835	846373	884540	880859	766250	852681	960299	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	37529	77621	149560	365502	633480	1437780	3553725	6098540	10079344	13914583	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	813944	874055	869763	879100	768834	848036	861669	732913	851921	870576	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	29838	57181	107761	257580	448104	983802	2414543	4188135	6946632	9474720	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41070	79165	162312	393842	700357	1526123	3879673	6750830	11215472	14954365	

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.749	1.749	1.742	1.749	1.743	1.743	1.749	1.756	1.750	1.749	1.748	0.253
8 PFBA	1.749	1.756	1.749	1.756	1.749	1.749	1.756	1.756	1.756	1.756	1.753	0.191
D 50 13C5_PFPeA	2.056	2.045	2.055	2.045	2.045	2.045	2.045	2.045	2.045	2.055	2.048	0.240
21 PFPeA	2.056	2.045	2.055	2.045	2.045	2.045	2.045	2.045	2.045	2.055	2.048	0.240
D 44 13C3_PFBS	2.087	2.077	2.087	2.077	2.087	2.087	2.077	2.088	2.088	2.087	2.084	0.245
7 PFBS	2.098	2.077	2.087	2.077	2.087	2.087	2.077	2.088	2.088	2.087	2.085	0.316
D 63 13C2_4:2 FTS_2	2.317	2.300	2.316	2.300	2.308	2.308	2.291	2.308	2.308	2.317	2.307	0.363
1 4:2 FTS	2.326	2.300	2.316	2.300	2.317	2.308	2.291	2.308	2.308	2.308	2.308	0.426
D 49 13C5_PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
* 39 13C2_PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
15 PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
22 PFPeS	2.370	2.353	2.370	2.353	2.361	2.362	2.344	2.362	2.362	2.370	2.360	0.374
28 GenX	2.451	2.424	2.450	2.424	2.441	2.442	2.415	2.433	2.433	2.442	2.435	0.476
D 66 13C3_GenX	2.451	2.424	2.450	2.424	2.441	2.442	2.415	2.433	2.433	2.442	2.435	0.476
13 PFHpA	2.681	2.654	2.681	2.645	2.672	2.672	2.645	2.663	2.672	2.681	2.666	0.529
D 47 13C4_PFHpA	2.681	2.645	2.681	2.645	2.672	2.672	2.645	2.663	2.672	2.672	2.664	0.544
D 45 13C3_PFHxS	2.690	2.654	2.690	2.654	2.681	2.681	2.645	2.672	2.681	2.690	2.674	0.632
14 PFHxS	2.690	2.654	2.690	2.654	2.681	2.681	2.654	2.672	2.681	2.690	2.674	0.573
29 ADONA	2.718	2.681	2.717	2.681	2.708	2.709	2.681	2.700	2.709	2.708	2.701	0.540
2 6:2 FTS	Disabled	2.975	3.011	2.987	3.005	3.012	2.987	3.012	3.027	3.032	3.005	0.623
D 64 13C2_6:2 FTS_2	3.020	2.981	3.011	2.987	3.005	3.012	2.987	3.012	3.027	3.032	3.007	0.570
* 41 13C2_PFOA	3.041	3.006	3.038	3.012	3.025	3.039	3.012	3.034	3.047	3.052	3.030	0.533
D 53 13C8_PFOA	3.041	3.006	3.032	3.012	3.025	3.039	3.012	3.034	3.047	3.052	3.029	0.525
20 PFOA	3.047	3.012	3.038	3.012	3.025	3.039	3.012	3.041	3.047	3.052	3.032	0.529
12 PFHpS	3.047	3.006	3.038	3.018	3.032	3.039	3.012	3.041	3.054	3.059	3.034	0.586
D 54 13C8_PFOS	3.403	3.374	3.394	3.394	3.394	3.402	3.402	3.418	3.433	3.438	3.405	0.575
* 48 13C4_PFOS	3.411	3.374	3.401	3.394	3.394	3.402	3.394	3.418	3.433	3.438	3.405	0.575
18 PFOS	3.411	3.374	3.401	3.394	3.394	3.409	3.402	3.426	3.433	3.438	3.408	0.580
D 56 13C9_PFNA	3.418	3.381	3.401	3.402	3.401	3.409	3.402	3.433	3.440	3.446	3.413	0.602
17 PFNA	3.411	3.381	3.408	3.402	3.401	3.409	3.402	3.433	3.448	3.446	3.414	0.624
30 9Cl-PF3ONS	3.609	3.585	3.598	3.615	3.606	3.615	3.615	3.639	3.651	3.649	3.618	0.604
D 55 13C8_PFOSA	3.705	3.679	3.695	3.717	3.710	3.710	3.717	3.740	3.746	3.751	3.717	0.615
19 PFOSA	3.719	3.679	3.695	3.717	3.710	3.710	3.717	3.733	3.753	3.751	3.718	0.616

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.746	3.726	3.737	3.752	3.744	3.752	3.758	3.775	3.790	3.787	3.756	0.561
D 65 13C2_8:2 FTS_2	3.753	3.726	3.737	3.759	3.751	3.752	3.758	3.782	3.798	3.795	3.761	0.630
10 PFDA	3.760	3.733	3.751	3.766	3.758	3.759	3.765	3.790	3.806	3.803	3.769	0.624
* 37 13C2_PFDA	3.760	3.733	3.744	3.766	3.758	3.765	3.765	3.790	3.798	3.803	3.768	0.601
D 51 13C6_PFDA	3.753	3.733	3.744	3.766	3.758	3.759	3.765	3.782	3.798	3.803	3.766	0.595
3 8:2 FTS	3.760	3.733	3.744	3.759	3.758	3.759	3.758	3.782	3.798	3.795	3.764	0.557
D 58 d3-MeFOSAA	3.912	3.887	3.901	3.918	3.917	3.918	3.926	3.945	3.954	3.960	3.923	0.591
6 N-MeFOSAA	3.912	3.895	3.909	3.926	3.926	3.918	3.926	3.945	3.963	3.960	3.928	0.567
9 PFDS	4.045	4.027	4.040	4.068	4.058	4.059	4.068	Disabled	Disabled	Disabled	4.051	0.379
D 52 13C7_PFUdA	4.062	4.044	4.058	4.085	4.076	4.068	4.086	4.098	4.106	4.120	4.080	0.575
D 60 d5-EtFOSAA	4.062	4.044	4.058	4.094	4.085	4.076	4.095	4.107	4.115	4.120	4.085	0.622
25 PFUdA	4.062	4.044	4.058	4.085	4.085	4.076	4.086	4.107	4.115	4.120	4.083	0.612
5 N-EtFOSAA	4.071	4.053	4.058	4.094	4.093	4.076	4.095	4.116	4.115	4.129	4.090	0.618
D 61 d7-MeFOSE	4.124	4.106	4.120	4.157	4.147	4.139	4.157	4.169	4.169	4.182	4.146	0.587
32 MeFOSE	4.133	4.115	4.129	4.165	4.156	4.148	4.166	4.178	4.186	4.192	4.156	0.611
D 57 d3-MeFOSA	4.142	4.124	4.138	4.174	4.164	4.156	4.175	4.187	4.196	4.201	4.165	0.613
26 MeFOSA	4.151	4.133	4.138	4.183	4.173	4.156	4.175	4.187	4.196	4.201	4.169	0.568
31 11Cl-PF3OUDS	4.206	4.178	4.191	4.233	4.221	4.213	4.234	4.237	4.247	4.252	4.221	0.570
D 62 d9-EtFOSE	4.287	4.267	4.282	4.324	4.313	4.304	4.314	4.328	4.338	4.342	4.309	0.579
33 EtFOSE	4.298	4.277	4.292	4.334	4.323	4.314	4.335	4.338	4.347	4.352	4.321	0.576
D 59 d5-EtFOSA	4.308	4.287	4.302	4.344	4.333	4.314	4.335	4.347	4.357	4.361	4.328	0.571
27 EtFOSA	4.318	4.287	4.302	4.344	4.342	4.324	4.344	4.357	4.357	4.370	4.334	0.599
D 38 13C2_PFDoA	4.328	4.307	4.322	4.363	4.352	4.344	4.363	4.375	4.375	4.386	4.351	0.592
11 PFDoA	4.338	4.307	4.322	4.363	4.352	4.344	4.363	4.375	4.375	4.386	4.352	0.572
4 10:2 FTS	4.347	4.317	4.332	4.372	4.370	4.353	4.372	4.383	4.390	4.394	4.363	0.569
34 PFDOS	4.544	4.508	4.513	4.566	4.565	4.541	4.566	4.569	4.577	4.582	4.553	0.565
24 PFTrDA	4.561	4.535	4.549	4.591	4.590	4.574	4.591	4.594	4.602	4.607	4.579	0.531
D 42 13C2_PFTeDA	4.769	4.728	4.738	4.792	4.786	4.766	4.792	4.794	4.800	4.803	4.776	0.546
23 PFTeDA	4.769	4.735	4.738	4.792	4.786	4.766	4.792	4.794	4.800	4.803	4.777	0.516
D 40 13C2_PFHxDA	5.128	5.081	5.091	5.145	5.139	5.115	5.145	5.146	5.152	5.156	5.130	0.509
35 PFHxDA	5.128	5.081	5.091	5.151	5.145	5.121	5.145	5.146	5.152	5.156	5.131	0.517
36 PFODA	5.489	5.440	5.444	5.514	5.507	5.472	5.507	5.502	5.517	5.514	5.490	0.531

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B028.d
Injection Date: 23-Jul-2021 01:14:35 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC- 1577 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	697063			123.8	50 - 150
8 PFBA			500.00	412.81	82.6	70 - 130
D 50 13C5_PFPeA	523546	646174			123.4	50 - 150
21 PFPeA			500.00	413.60	82.7	70 - 130
7 PFBS			442.50	374.28	84.6	70 - 130
D 44 13C3_PFBS	169277	219583			129.7	50 - 150
D 63 13C2_4:2 FTS_2	90196	109973			121.9	50 - 150
1 4:2 FTS			467.50	512.75	109.7	70 - 130
D 49 13C5_PFHxA	600114	753591			125.6	50 - 150
15 PFHxA			500.00	402.35	80.5	70 - 130
22 PFPeS			470.00	393.01	83.6	70 - 130
28 GenX			2500.00	2196.01	87.8	70 - 130
D 66 13C3_GenX	1000599	1205811			120.5	50 - 150
D 47 13C4_PFHpA	482787	629323			130.4	50 - 150
13 PFHpA			500.00	403.53	80.7	70 - 130
D 45 13C3_PFHxS	137682	162385			117.9	50 - 150
14 PFHxS			456.00	378.36	83	70 - 130
29 ADONA			2355.00	2154.64	91.5	70 - 130
D 64 13C2_6:2 FTS_2	77321	92003			119	50 - 150
2 6:2 FTS			475.00	376.51	79.3	70 - 130
20 PFOA			500.00	424.92	85	70 - 130
D 53 13C8_PFOA	538966	589571			109.4	50 - 150
12 PFHpS			475.00	416.18	87.6	70 - 130
18 PFOS			462.75	397.81	86	70 - 130
D 54 13C8_PFOS	139992	170702			121.9	50 - 150
17 PFNA			500.00	381.86	76.4	70 - 130
D 56 13C9_PFNA	618881	769275			124.3	50 - 150
30 9Cl-PF3ONS			2330.00	1889.62	81.1	70 - 130
D 55 13C8_PFOSA	250019	323061			129.2	50 - 150
19 PFOSA			500.00	433.98	86.8	70 - 130
16 PFNS			480.00	405.71	84.5	70 - 130
D 65 13C2_8:2 FTS_2	72182	102430			141.9	50 - 150
10 PFDA			500.00	440.32	88.1	70 - 130
3 8:2 FTS			480.00	469.71	97.9	70 - 130
D 51 13C6_PFDA	590501	740625			125.4	50 - 150
D 58 d3-MeFOSAA	601725	791178			131.5	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	534.50	106.9	70 - 130
9 PFDS			482.50	416.99	86.4	70 - 130
D 52 13C7_PFUdA	707587	862142			121.8	50 - 150
25 PFUdA			500.00	410.40	82.1	70 - 130
D 60 d5-EtFOSAA	521292	662875			127.2	50 - 150
5 N-EtFOSAA			500.00	547.14	109.4	70 - 130
D 61 d7-MeFOSE	68295	98617			144.4	50 - 150
D 57 d3-MeFOSA	40777	55738			136.7	50 - 150
31 11Cl-PF3OUDS			2355.00	1917.40	81.4	70 - 130
D 62 d9-EtFOSE	68452	89797			131.2	50 - 150
D 59 d5-EtFOSA	38025	50890			133.8	50 - 150
11 PFDoA			500.00	395.66	79.1	70 - 130
D 38 13C2_PFDoA	745164	941425			126.3	50 - 150
4 10:2 FTS			2410.00	2228.22	92.5	70 - 130
24 PFTrDA			500.00	449.20	89.8	70 - 130
23 PFTeDA			500.00	437.70	87.5	70 - 130
D 42 13C2_PFTeDA	846373	1087648			128.5	50 - 150
D 40 13C2_PFHxDA	768834	934133			121.5	50 - 150

Report Date: 29-Jul-2021 18:55:03 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\072821-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	28-Jul-2021 12:35:26	072821005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	28-Jul-2021 12:46:55	072821006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	28-Jul-2021 12:58:02	072821007.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ10188-001	28-Jul-2021 13:10:17	072821008.d	MBlk		Aqueous	1	10188	Surrogates	Smp	0.1100		
2	WQ10188-002	28-Jul-2021 13:21:19	072821009.d	LCS		Aqueous	1	10188	Analytes	100x PDS	0.2000		PeS(133.4),MFOSA(167%), RR TO CONFIRM
3	WG27017-001	28-Jul-2021 13:32:11	072821010.d	Client	AFFF21-FRB-01-072621-00	Aqueous	1	10188	Surrogates	Smp	0.1100		
4	WG27017-002	28-Jul-2021 13:43:06	072821011.d	Client	AFFF21-ICE-01-072621-01	Aqueous	1	10188	Surrogates	Smp	0.1100		
5	WG27016-001	28-Jul-2021 13:53:42	072821012.d	Client	AFFF21-GAC-01-072621-00	Aqueous	1	10188	Surrogates	Smp	0.1100		
6	WG21050-003	28-Jul-2021 14:04:16	072821013.d	Client	FP-15e	Soil	5	99971	Surrogates	Smp	0.1100		
7	WG21051-002	28-Jul-2021 14:14:53	072821014.d	Client	FP-14c/PTFE Powder	Soil	5	99971	Surrogates	Smp	0.1100		
8	WG21051-001	28-Jul-2021 14:25:35	072821015.d	Client	FP-14/PTFE Powder	Soil	100	99971	Surrogates	Smp	0.1100		
9	WG20002-003	28-Jul-2021 14:36:13	072821016.d	Client	AOPC7-SB02-0-0.5	Soil	5	99970	Surrogates	Smp	0.1100		
10	WG20002-004	28-Jul-2021 14:46:51	072821017.d	Client	AOPC7-SB02-0.5-2	Soil	20	99970	Surrogates	Smp	0.1100		
11	WG20002-009	28-Jul-2021 14:57:32	072821018.d	Client	AOPC1-SB03-0-0.5	Soil	5	99970	Surrogates	Smp	0.1100		
12	WG20002-010	28-Jul-2021 15:08:05	072821019.d	Client	AOPC1-SB03-0.5-2	Soil	10	99970	Surrogates	Smp	0.1100		
13	ID CCV 1000_SVLC-1573	28-Jul-2021 15:18:39	072821020.d	CCV					Analytes	L-5	1.00		
14	ccb 1	28-Jul-2021 15:29:15	072821021.d	InstBlk					Surrogates	Smp	0.1100		
15	WG20002-014	28-Jul-2021 15:39:52	072821022.d	Client	AOPC6-SB01-0.5-2	Soil	20	99970	Surrogates	Smp	0.1100		
16	WG20004-019	28-Jul-2021 15:50:32	072821023.d	Client	FB-07-071521	Aqueous	1	10188	Surrogates	Smp	0.1100		
17	WG20004-020	28-Jul-2021 16:01:10	072821024.d	Client	AOPC5-14D12A-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
18	WG20004-021	28-Jul-2021 16:11:48	072821025.d	Client	AOPC5-14D12A-071621-FD	Aqueous	1	10188	Surrogates	Smp	0.1100		
19	WG20004-022	28-Jul-2021 16:22:25	072821026.d	Client	AOPC3-W19-2-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
20	WG20004-023	28-Jul-2021 16:33:05	072821027.d	Client	AOPC3-W7-10-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
21	WG20004-024	28-Jul-2021 16:43:46	072821028.d	Client	AOPC24-171A-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
22	WG20004-024MS	28-Jul-2021 16:54:22	072821029.d	MS		Aqueous	1	10188	Analytes	100x PDS	0.2000		
23	WG20004-025	28-Jul-2021 17:04:56	072821030.d	Client	FB-08-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
24	WG20004-026	28-Jul-2021 17:15:33	072821031.d	Client	FB-07-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		SUR: TeDA(LOW), INSUFFICIENT SAMPLE, NCM
25	WG22011-001	28-Jul-2021 17:26:09	072821032.d	Client	AOPC24-W89-1-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
26	ID CCV 1000A_SVLC-1573	28-Jul-2021 17:36:43	072821033.d	CCV					Analytes	L-5	1.00		
27	CCB 2	28-Jul-2021 17:47:22	072821034.d	InstBlk					Surrogates	Smp	0.1100		
28	WG22011-002	28-Jul-2021 17:58:05	072821035.d	Client	AOPC3-W7-3-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
29	WG22011-003	28-Jul-2021 18:08:42	072821036.d	Client	AOPC3-W7-3-071921-FD	Aqueous	1	10188	Surrogates	Smp	0.1100		
30	WG22011-004	28-Jul-2021 18:19:21	072821037.d	Client	AOPC3-W7-11-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
31	WG22011-005	28-Jul-2021 18:30:02	072821038.d	Client	AOPC03-W7-13-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd),ncm
32	WG22011-006	28-Jul-2021 18:40:36	072821039.d	Client	AOPC03-UST-MW-02-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd),ncm
33	WG22011-007	28-Jul-2021 18:51:11	072821040.d	Client	AOPC21-W4-14-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd)6:2(detect),8:2(nd),confirmed, ncm
34	WG22011-007DU	28-Jul-2021 19:01:47	072821041.d	Client		Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd)6:2(detect),8:2(nd),ncm parent sample
35	WG22011-008	28-Jul-2021 19:12:26	072821042.d	Client	AOPC21-W6-6-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
36	WG22011-009	28-Jul-2021 19:23:04	072821043.d	Client	FB-09-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
37	ID CCV 1000B_SVLC-1573	28-Jul-2021 19:33:41	072821044.d	CCV					Analytes	L-5	1.00		
38	CCB 3	28-Jul-2021 19:44:21	072821045.d	InstBlk					Surrogates	Smp	0.1100		
39	WQ10065-001	28-Jul-2021 19:54:59	072821046.d	MBlk		Soil	1	10065	Surrogates	Smp	0.1100		
40	WQ10065-002	28-Jul-2021 20:05:40	072821047.d	LCS		Soil	1	10065	Analytes	100x PDS	0.1000		
41	WG20002-020	28-Jul-2021 20:16:22	072821048.d	Client	AOPC2-SB03-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		

Report Date: 29-Jul-2021 18:55:03 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\072821-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
42	WG20002-020MS	28-Jul-2021 20:26:59	072821049.d	MS		Soil	1	10065	Analytes	100x PDS	0.1000		
43	WG20002-020MD	28-Jul-2021 20:37:37	072821050.d	MSD		Soil	1	10065	Analytes	100x PDS	0.1000		
44	WG20002-022	28-Jul-2021 20:48:15	072821051.d	Client	AOPC2-SB04-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
45	WG20002-023	28-Jul-2021 20:58:51	072821052.d	Client	AOPC2-SB05-0-0.5	Soil	1	10065	Surrogates	Smp	0.1100		
46	WG20002-024	28-Jul-2021 21:09:28	072821053.d	Client	AOPC2-SB05-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
47	WG20002-025	28-Jul-2021 21:20:07	072821054.d	Client	AOPC2-SB06-0-0.5	Soil	1	10065	Surrogates	Smp	0.1100		
48	WG20002-026	28-Jul-2021 21:30:47	072821055.d	Client	AOPC2-SB06-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
49	WG20002-027	28-Jul-2021 21:41:27	072821056.d	Client	AOPC2-SB07-0-0.5	Soil	1	10065	Surrogates	Smp	0.1100		
50	WG20002-028	28-Jul-2021 21:52:06	072821057.d	Client	AOPC2-SB07-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
51	WG22019-001	28-Jul-2021 22:02:46	072821058.d	Client	RRAD-FFTA-01-SE-072021	Soil	1	10065	Surrogates	Smp	0.1100		
52	WG22019-001MS	28-Jul-2021 22:13:22	072821059.d	MS		Soil	1	10065	Analytes	100x PDS	0.1000		
53	WG22019-001MD	28-Jul-2021 22:23:58	072821060.d	MSD		Soil	1	10065	Analytes	100x PDS	0.1000		
54	WG22019-002	28-Jul-2021 22:34:36	072821061.d	Client	RRAD-FD-01-SE-072021	Soil	1	10065	Surrogates	Smp	0.1100		
55	ID CCV 1000C_SVLC-1573	28-Jul-2021 22:45:16	072821062.d	CCV					Analytes	L-5	1.00		MeFOSA(139%)

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821005.d
Injection Date: 28-Jul-2021 12:35:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	546632			97.1	50 - 150
8 PFBA			100.00	106.07	106.1	70 - 130
D 50 13C5_PFPeA	523546	503885			96.2	50 - 150
21 PFPeA			100.00	99.807	99.8	70 - 130
7 PFBS			88.400	86.535	97.9	70 - 130
D 44 13C3_PFBS	169277	179569			106.1	50 - 150
D 63 13C2_4:2 FTS_2	90196	94243			104.5	50 - 150
1 4:2 FTS			93.400	82.174	88	70 - 130
D 49 13C5_PFHxA	600114	629624			104.9	50 - 150
15 PFHxA			100.00	97.024	97	70 - 130
22 PFPeS			93.800	101.63	108.3	70 - 130
28 GenX			200.00	209.53	104.8	70 - 130
D 66 13C3_GenX	1000599	1187852			118.7	50 - 150
D 47 13C4_PFHpA	482787	481492			99.7	50 - 150
13 PFHpA			100.00	110.72	110.7	70 - 130
D 45 13C3_PFHxS	137682	146388			106.3	50 - 150
14 PFHxS			91.000	99.394	109.2	70 - 130
29 ADONA			94.200	91.184	96.8	70 - 130
D 64 13C2_6:2 FTS_2	77321	82438			106.6	50 - 150
2 6:2 FTS			94.800	138.96	146.6	70 - 130
20 PFOA			100.00	105.05	105.1	70 - 130
D 53 13C8_PFOA	538966	470743			87.3	50 - 150
12 PFHpS			95.200	100.76	105.8	70 - 130
18 PFOS			92.800	89.095	96	70 - 130
D 54 13C8_PFOS	139992	144963			103.6	50 - 150
17 PFNA			100.00	107.95	108	70 - 130
D 56 13C9_PFNA	618881	590148			95.4	50 - 150
30 9Cl-PF3ONS			93.200	95.720	102.7	70 - 130
D 55 13C8_PFOSA	250019	308005			123.2	50 - 150
19 PFOSA			100.00	94.128	94.1	70 - 130
16 PFNS			96.000	98.737	102.9	70 - 130
D 65 13C2_8:2 FTS_2	72182	92140			127.6	50 - 150
10 PFDA			100.00	107.05	107.1	70 - 130
3 8:2 FTS			95.800	94.614	98.8	70 - 130
D 51 13C6_PFDA	590501	611283			103.5	50 - 150
D 58 d3-MeFOSAA	601725	685228			113.9	50 - 150

NO SAMPLES ASSOCIATED

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	107.78	107.8	70 - 130
9 PFDS			96.400	82.676	85.8	70 - 130
D 52 13C7_PFUdA	707587	617181			87.2	50 - 150
25 PFUdA			100.00	109.36	109.4	70 - 130
D 60 d5-EtFOSAA	521292	639425			122.7	50 - 150
5 N-EtFOSAA			100.00	104.16	104.2	70 - 130
D 61 d7-MeFOSE	68295	82233			120.4	50 - 150
32 MeFOSE			100.00	101.17	101.2	70 - 130
D 57 d3-MeFOSA	40777	48879			119.9	50 - 150
26 MeFOSA			100.00	155.34	155.3	70 - 130
31 11Cl-PF3OUDS			94.200	86.050	91.3	70 - 130
D 62 d9-EtFOSE	68452	91569			133.8	50 - 150
33 EtFOSE			100.00	114.93	114.9	70 - 130
D 59 d5-EtFOSA	38025	46046			121.1	50 - 150
27 EtFOSA			100.00	129.09	129.1	70 - 130
11 PFDoA			100.00	101.65	101.6	70 - 130
D 38 13C2_PFDoA	745164	634813			85.2	50 - 150
4 10:2 FTS			96.400	59.041	61.2	70 - 130
34 PFDOS			96.800	106.64	110.2	70 - 130
24 PFTrDA			100.00	110.77	110.8	70 - 130
23 PFTeDA			100.00	104.62	104.6	70 - 130
D 42 13C2_PFTeDA	846373	795642			94	50 - 150
D 40 13C2_PFHxDA	768834	940962			122.4	50 - 150
35 PFHxDA			100.00	110.61	110.6	70 - 130
36 PFODA			100.00	101.33	101.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821006.d
Injection Date: 28-Jul-2021 12:46:55 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	532713			97.5	50 - 150
8 PFBA			200.00	209.70	104.9	70 - 130
D 50 13C5_PFPeA	503885	506454			100.5	50 - 150
21 PFPeA			200.00	205.71	102.9	70 - 130
7 PFBS			176.80	167.24	94.6	70 - 130
D 44 13C3_PFBS	179569	173147			96.4	50 - 150
D 63 13C2_4:2 FTS_2	94243	92247			97.9	50 - 150
1 4:2 FTS			186.80	206.65	110.6	70 - 130
D 49 13C5_PFHxA	629624	592724			94.1	50 - 150
15 PFHxA			200.00	196.96	98.5	70 - 130
22 PFPeS			187.60	175.54	93.6	70 - 130
28 GenX			400.00	388.20	97	70 - 130
D 66 13C3_GenX	1187852	1201835			101.2	50 - 150
D 47 13C4_PFHpA	481492	478720			99.4	50 - 150
13 PFHpA			200.00	194.94	97.5	70 - 130
D 45 13C3_PFHxS	146388	146100			99.8	50 - 150
14 PFHxS			182.00	174.78	96	70 - 130
29 ADONA			188.40	203.53	108	70 - 130
D 64 13C2_6:2 FTS_2	82438	81726			99.1	50 - 150
2 6:2 FTS			189.60	242.08	127.7	70 - 130
20 PFOA			200.00	216.34	108.2	70 - 130
D 53 13C8_PFOA	470743	480954			102.2	50 - 150
12 PFHpS			190.40	181.59	95.4	70 - 130
18 PFOS			185.60	192.84	103.9	70 - 130
D 54 13C8_PFOS	144963	138675			95.7	50 - 150
17 PFNA			200.00	206.95	103.5	70 - 130
D 56 13C9_PFNA	590148	602400			102.1	50 - 150
30 9Cl-PF3ONS			186.40	202.35	108.6	70 - 130
D 55 13C8_PFOSA	308005	289138			93.9	50 - 150
19 PFOSA			200.00	192.38	96.2	70 - 130
16 PFNS			192.00	183.05	95.3	70 - 130
D 65 13C2_8:2 FTS_2	92140	80795			87.7	50 - 150
10 PFDA			200.00	218.74	109.4	70 - 130
3 8:2 FTS			191.60	188.51	98.4	70 - 130
D 51 13C6_PFDA	611283	584926			95.7	50 - 150
D 58 d3-MeFOSAA	685228	678804			99.1	50 - 150

NO SAMPLES ASSOCIATED

Report Date: 29-Jul-2021 18:54:26 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	204.94	102.5	70 - 130
9 PFDS			192.80	188.66	97.9	70 - 130
D 52 13C7_PFUdA	617181	615913			99.8	50 - 150
25 PFUdA			200.00	220.01	110	70 - 130
D 60 d5-EtFOSAA	639425	665547			104.1	50 - 150
5 N-EtFOSAA			200.00	175.76	87.9	70 - 130
D 61 d7-MeFOSE	82233	83653			101.7	50 - 150
32 MeFOSE			200.00	166.69	83.3	70 - 130
D 57 d3-MeFOSA	48879	55116			112.8	50 - 150
26 MeFOSA			200.00	248.05	124	70 - 130
31 11Cl-PF3OUDS			188.40	190.21	101	70 - 130
D 62 d9-EtFOSE	91569	96548			105.4	50 - 150
33 EtFOSE			200.00	190.04	95	70 - 130
D 59 d5-EtFOSA	46046	46074			100.1	50 - 150
27 EtFOSA			200.00	189.84	94.9	70 - 130
11 PFDoA			200.00	215.77	107.9	70 - 130
D 38 13C2_PFDoA	634813	602536			94.9	50 - 150
4 10:2 FTS			192.80	124.16	64.4	70 - 130
34 PFDOS			193.60	204.87	105.8	70 - 130
24 PFTrDA			200.00	236.97	118.5	70 - 130
23 PFTeDA			200.00	207.18	103.6	70 - 130
D 42 13C2_PFTeDA	795642	780807			98.1	50 - 150
D 40 13C2_PFHxDA	940962	935974			99.5	50 - 150
35 PFHxDA			200.00	210.73	105.4	70 - 130
36 PFODA			200.00	198.88	99.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821020.d
Injection Date: 28-Jul-2021 15:18:39 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 13
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	537206			98.3	50 - 150
8 PFBA			1000.00	913.62	91.4	70 - 130
D 50 13C5_PFPeA	503885	504020			100	50 - 150
21 PFPeA			1000.00	876.21	87.6	70 - 130
7 PFBS			884.00	774.61	87.6	70 - 130
D 44 13C3_PFBS	179569	182176			101.5	50 - 150
D 63 13C2_4:2 FTS_2	94243	72781			77.2	50 - 150
1 4:2 FTS			934.00	1114.80	119.4	70 - 130
D 49 13C5_PFHxA	629624	614275			97.6	50 - 150
15 PFHxA			1000.00	857.51	85.8	70 - 130
22 PFPeS			938.00	875.66	93.4	70 - 130
28 GenX			2000.00	2027.42	101.4	70 - 130
D 66 13C3_GenX	1187852	1062616			89.5	50 - 150
D 47 13C4_PFHpA	481492	461489			95.8	50 - 150
13 PFHpA			1000.00	921.59	92.2	70 - 130
D 45 13C3_PFHxS	146388	141652			96.8	50 - 150
14 PFHxS			910.00	849.46	93.3	70 - 130
29 ADONA			942.00	897.10	95.2	70 - 130
D 64 13C2_6:2 FTS_2	82438	78305			95	50 - 150
2 6:2 FTS			948.00	793.26	83.7	70 - 130
20 PFOA			1000.00	961.19	96.1	70 - 130
D 53 13C8_PFOA	470743	481448			102.3	50 - 150
12 PFHpS			952.00	963.52	101.2	70 - 130
18 PFOS			928.00	874.93	94.3	70 - 130
D 54 13C8_PFOS	144963	143465			99	50 - 150
17 PFNA			1000.00	887.59	88.8	70 - 130
D 56 13C9_PFNA	590148	624997			105.9	50 - 150
30 9Cl-PF3ONS			932.00	882.55	94.7	70 - 130
D 55 13C8_PFOSA	308005	259561			84.3	50 - 150
19 PFOSA			1000.00	994.11	99.4	70 - 130
16 PFNS			960.00	880.34	91.7	70 - 130
D 65 13C2_8:2 FTS_2	92140	80829			87.7	50 - 150
10 PFDA			1000.00	977.88	97.8	70 - 130
3 8:2 FTS			958.00	871.34	91	70 - 130
D 51 13C6_PFDA	611283	587218			96.1	50 - 150
D 58 d3-MeFOSAA	685228	642514			93.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1061.22	106.1	70 - 130
9 PFDS			964.00	853.29	88.5	70 - 130
D 52 13C7_PFUdA	617181	651512			105.6	50 - 150
25 PFUdA			1000.00	884.22	88.4	70 - 130
D 60 d5-EtFOSAA	639425	612730			95.8	50 - 150
5 N-EtFOSAA			1000.00	1073.91	107.4	70 - 130
D 61 d7-MeFOSE	82233	79731			97	50 - 150
32 MeFOSE			1000.00	1023.81	102.4	70 - 130
D 57 d3-MeFOSA	48879	53918			110.3	50 - 150
26 MeFOSA			1000.00	1014.86	101.5	70 - 130
31 11Cl-PF3OUDS			942.00	848.83	90.1	70 - 130
D 62 d9-EtFOSE	91569	82839			90.5	50 - 150
33 EtFOSE			1000.00	987.52	98.8	70 - 130
D 59 d5-EtFOSA	46046	46326			100.6	50 - 150
27 EtFOSA			1000.00	975.21	97.5	70 - 130
11 PFDoA			1000.00	950.45	95	70 - 130
D 38 13C2_PFDoA	634813	606075			95.5	50 - 150
4 10:2 FTS			964.00	607.41	63	70 - 130
34 PFDOS			968.00	971.90	100.4	70 - 130
24 PFTrDA			1000.00	1045.86	104.6	70 - 130
23 PFTeDA			1000.00	891.80	89.2	70 - 130
D 42 13C2_PFTeDA	795642	809980			101.8	50 - 150
D 40 13C2_PFHxDA	940962	813603			86.5	50 - 150
35 PFHxDA			1000.00	1053.14	105.3	70 - 130
36 PFODA			1000.00	1033.85	103.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821033.d
Injection Date: 28-Jul-2021 17:36:43 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 26
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	545149			99.7	50 - 150
8 PFBA			1000.00	971.01	97.1	70 - 130
D 50 13C5_PFPeA	503885	523750			103.9	50 - 150
21 PFPeA			1000.00	901.15	90.1	70 - 130
7 PFBS			884.00	779.30	88.2	70 - 130
D 44 13C3_PFBS	179569	188474			105	50 - 150
D 63 13C2_4:2 FTS_2	94243	83272			88.4	50 - 150
1 4:2 FTS			934.00	877.37	93.9	70 - 130
D 49 13C5_PFHxA	629624	605375			96.1	50 - 150
15 PFHxA			1000.00	894.52	89.5	70 - 130
22 PFPeS			938.00	804.47	85.8	70 - 130
28 GenX			2000.00	2019.49	101	70 - 130
D 66 13C3_GenX	1187852	1077187			90.7	50 - 150
D 47 13C4_PFHpA	481492	507047			105.3	50 - 150
13 PFHpA			1000.00	855.84	85.6	70 - 130
D 45 13C3_PFHxS	146388	153046			104.5	50 - 150
14 PFHxS			910.00	809.61	89	70 - 130
29 ADONA			942.00	816.31	86.7	70 - 130
D 64 13C2_6:2 FTS_2	82438	77999			94.6	50 - 150
2 6:2 FTS			948.00	780.78	82.4	70 - 130
20 PFOA			1000.00	948.39	94.8	70 - 130
D 53 13C8_PFOA	470743	484657			103	50 - 150
12 PFHpS			952.00	878.21	92.2	70 - 130
18 PFOS			928.00	799.33	86.1	70 - 130
D 54 13C8_PFOS	144963	149391			103.1	50 - 150
17 PFNA			1000.00	935.11	93.5	70 - 130
D 56 13C9_PFNA	590148	619880			105	50 - 150
30 9Cl-PF3ONS			932.00	885.73	95	70 - 130
D 55 13C8_PFOSA	308005	285372			92.7	50 - 150
19 PFOSA			1000.00	999.93	100	70 - 130
16 PFNS			960.00	956.75	99.7	70 - 130
D 65 13C2_8:2 FTS_2	92140	81699			88.7	50 - 150
10 PFDA			1000.00	925.82	92.6	70 - 130
3 8:2 FTS			958.00	969.75	101.2	70 - 130
D 51 13C6_PFDA	611283	610453			99.9	50 - 150
D 58 d3-MeFOSAA	685228	658321			96.1	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1049.15	104.9	70 - 130
9 PFDS			964.00	900.43	93.4	70 - 130
D 52 13C7_PFUdA	617181	660939			107.1	50 - 150
25 PFUdA			1000.00	916.37	91.6	70 - 130
D 60 d5-EtFOSAA	639425	631092			98.7	50 - 150
5 N-EtFOSAA			1000.00	1007.20	100.7	70 - 130
D 61 d7-MeFOSE	82233	80139			97.5	50 - 150
32 MeFOSE			1000.00	1092.62	109.3	70 - 130
D 57 d3-MeFOSA	48879	49134			100.5	50 - 150
26 MeFOSA			1000.00	1184.64	118.5	70 - 130
31 11Cl-PF3OUDS			942.00	863.21	91.6	70 - 130
D 62 d9-EtFOSE	91569	96370			105.2	50 - 150
33 EtFOSE			1000.00	913.45	91.3	70 - 130
D 59 d5-EtFOSA	46046	42954			93.3	50 - 150
27 EtFOSA			1000.00	1117.98	111.8	70 - 130
11 PFDoA			1000.00	988.89	98.9	70 - 130
D 38 13C2_PFDoA	634813	630434			99.3	50 - 150
4 10:2 FTS			964.00	638.82	66.3	70 - 130
34 PFDOS			968.00	949.67	98.1	70 - 130
24 PFTrDA			1000.00	1036.97	103.7	70 - 130
23 PFTeDA			1000.00	883.81	88.4	70 - 130
D 42 13C2_PFTeDA	795642	828717			104.2	50 - 150
D 40 13C2_PFHxDA	940962	870336			92.5	50 - 150
35 PFHxDA			1000.00	1032.48	103.2	70 - 130
36 PFODA			1000.00	986.11	98.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821044.d
Injection Date: 28-Jul-2021 19:33:41 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 37
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	552865			101.1	50 - 150
8 PFBA			1000.00	934.48	93.4	70 - 130
D 50 13C5_PFPeA	503885	536769			106.5	50 - 150
21 PFPeA			1000.00	941.28	94.1	70 - 130
7 PFBS			884.00	782.86	88.6	70 - 130
D 44 13C3_PFBS	179569	192235			107.1	50 - 150
D 63 13C2_4:2 FTS_2	94243	82169			87.2	50 - 150
1 4:2 FTS			934.00	1081.11	115.8	70 - 130
D 49 13C5_PFHxA	629624	619247			98.4	50 - 150
15 PFHxA			1000.00	899.50	90	70 - 130
22 PFPeS			938.00	767.43	81.8	70 - 130
28 GenX			2000.00	2054.98	102.7	70 - 130
D 66 13C3_GenX	1187852	1042789			87.8	50 - 150
D 47 13C4_PFHpA	481492	511172			106.2	50 - 150
13 PFHpA			1000.00	884.17	88.4	70 - 130
D 45 13C3_PFHxS	146388	157053			107.3	50 - 150
14 PFHxS			910.00	813.24	89.4	70 - 130
29 ADONA			942.00	782.91	83.1	70 - 130
D 64 13C2_6:2 FTS_2	82438	71868			87.2	50 - 150
2 6:2 FTS			948.00	966.28	101.9	70 - 130
20 PFOA			1000.00	875.16	87.5	70 - 130
D 53 13C8_PFOA	470743	505594			107.4	50 - 150
12 PFHpS			952.00	897.95	94.3	70 - 130
18 PFOS			928.00	821.20	88.5	70 - 130
D 54 13C8_PFOS	144963	154974			106.9	50 - 150
17 PFNA			1000.00	971.06	97.1	70 - 130
D 56 13C9_PFNA	590148	627173			106.3	50 - 150
30 9Cl-PF3ONS			932.00	872.21	93.6	70 - 130
D 55 13C8_PFOSA	308005	289452			94	50 - 150
19 PFOSA			1000.00	956.88	95.7	70 - 130
16 PFNS			960.00	900.45	93.8	70 - 130
D 65 13C2_8:2 FTS_2	92140	81466			88.4	50 - 150
10 PFDA			1000.00	925.43	92.5	70 - 130
3 8:2 FTS			958.00	867.81	90.6	70 - 130
D 51 13C6_PFDA	611283	622283			101.8	50 - 150
D 58 d3-MeFOSAA	685228	700845			102.3	50 - 150

Report Date: 29-Jul-2021 18:54:50 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\072821-DOD.b\072821044.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	985.82	98.6	70 - 130
9 PFDS			964.00	955.88	99.2	70 - 130
D 52 13C7_PFUdA	617181	675454			109.4	50 - 150
25 PFUdA			1000.00	930.24	93	70 - 130
D 60 d5-EtFOSAA	639425	639445			100	50 - 150
5 N-EtFOSAA			1000.00	918.02	91.8	70 - 130
D 61 d7-MeFOSE	82233	89728			109.1	50 - 150
32 MeFOSE			1000.00	962.59	96.3	70 - 130
D 57 d3-MeFOSA	48879	54203			110.9	50 - 150
26 MeFOSA			1000.00	1097.59	109.8	70 - 130
31 11Cl-PF3OUDS			942.00	861.40	91.4	70 - 130
D 62 d9-EtFOSE	91569	93460			102.1	50 - 150
33 EtFOSE			1000.00	1007.66	100.8	70 - 130
D 59 d5-EtFOSA	46046	47531			103.2	50 - 150
27 EtFOSA			1000.00	1052.33	105.2	70 - 130
11 PFDoA			1000.00	974.64	97.5	70 - 130
D 38 13C2_PFDoA	634813	661644			104.2	50 - 150
4 10:2 FTS			964.00	629.84	65.3	70 - 130
34 PFDOS			968.00	874.45	90.3	70 - 130
24 PFTrDA			1000.00	1067.84	106.8	70 - 130
23 PFTeDA			1000.00	893.23	89.3	70 - 130
D 42 13C2_PFTeDA	795642	870328			109.4	50 - 150
D 40 13C2_PFHxDA	940962	902003			95.9	50 - 150
35 PFHxDA			1000.00	1041.78	104.2	70 - 130
36 PFODA			1000.00	1002.51	100.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821062.d		
Injection Date:	28-Jul-2021 22:45:16	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	55
Sample Info:	ID CCV 1000C_SVLC-1573	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	543942			99.5	50 - 150
8 PFBA			1000.00	902.59	90.3	70 - 130
D 50 13C5_PFPeA	503885	518555			102.9	50 - 150
21 PFPeA			1000.00	866.21	86.6	70 - 130
7 PFBS			884.00	844.32	95.5	70 - 130
D 44 13C3_PFBS	179569	173490			96.6	50 - 150
D 63 13C2_4:2 FTS_2	94243	92455			98.1	50 - 150
1 4:2 FTS			934.00	952.24	102	70 - 130
D 49 13C5_PFHxA	629624	618670			98.3	50 - 150
15 PFHxA			1000.00	851.39	85.1	70 - 130
22 PFPeS			938.00	897.51	95.7	70 - 130
28 GenX			2000.00	1948.62	97.4	70 - 130
D 66 13C3_GenX	1187852	1042803			87.8	50 - 150
D 47 13C4_PFHpA	481492	493490			102.5	50 - 150
13 PFHpA			1000.00	870.35	87	70 - 130
D 45 13C3_PFHxS	146388	161824			110.5	50 - 150
14 PFHxS			910.00	748.96	82.3	70 - 130
29 ADONA			942.00	783.10	83.1	70 - 130
D 64 13C2_6:2 FTS_2	82438	80542			97.7	50 - 150
2 6:2 FTS			948.00	830.99	87.7	70 - 130
20 PFOA			1000.00	943.18	94.3	70 - 130
D 53 13C8_PFOA	470743	459144			97.5	50 - 150
12 PFHpS			952.00	807.90	84.9	70 - 130
18 PFOS			928.00	905.06	97.5	70 - 130
D 54 13C8_PFOS	144963	144716			99.8	50 - 150
17 PFNA			1000.00	909.61	91	70 - 130
D 56 13C9_PFNA	590148	603015			102.2	50 - 150
30 9Cl-PF3ONS			932.00	872.21	93.6	70 - 130
D 55 13C8_PFOSA	308005	279587			90.8	50 - 150
19 PFOSA			1000.00	1002.94	100.3	70 - 130
16 PFNS			960.00	898.92	93.6	70 - 130
D 65 13C2_8:2 FTS_2	92140	75672			82.1	50 - 150
10 PFDA			1000.00	893.01	89.3	70 - 130
3 8:2 FTS			958.00	947.80	98.9	70 - 130
D 51 13C6_PFDA	611283	587385			96.1	50 - 150
D 58 d3-MeFOSAA	685228	665738			97.2	50 - 150

Report Date: 29-Jul-2021 18:55:03 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\072821-DOD.b\072821062.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1123.60	112.4	70 - 130
9 PFDS			964.00	934.72	97	70 - 130
D 52 13C7_PFUdA	617181	567049			91.9	50 - 150
25 PFUdA			1000.00	1006.90	100.7	70 - 130
D 60 d5-EtFOSAA	639425	617124			96.5	50 - 150
5 N-EtFOSAA			1000.00	995.86	99.6	70 - 130
D 61 d7-MeFOSE	82233	77994			94.8	50 - 150
32 MeFOSE			1000.00	952.91	95.3	70 - 130
D 57 d3-MeFOSA	48879	47325			96.8	50 - 150
26 MeFOSA			1000.00	1390.30	139	70 - 130
31 11Cl-PF3OUDS			942.00	875.46	92.9	70 - 130
D 62 d9-EtFOSE	91569	89965			98.2	50 - 150
33 EtFOSE			1000.00	978.42	97.8	70 - 130
D 59 d5-EtFOSA	46046	46741			101.5	50 - 150
27 EtFOSA			1000.00	877.73	87.8	70 - 130
11 PFDoA			1000.00	843.61	84.4	70 - 130
D 38 13C2_PFDoA	634813	650327			102.4	50 - 150
4 10:2 FTS			964.00	655.75	68	70 - 130
34 PFDOS			968.00	949.33	98.1	70 - 130
24 PFTrDA			1000.00	978.87	97.9	70 - 130
23 PFTeDA			1000.00	907.70	90.8	70 - 130
D 42 13C2_PFTeDA	795642	809882			101.8	50 - 150
D 40 13C2_PFHxDA	940962	844877			89.8	50 - 150
35 PFHxDA			1000.00	1081.04	108.1	70 - 130
36 PFODA			1000.00	1032.52	103.3	70 - 130

Report Date: 03-Aug-2021 19:54:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

NO SAMPLES ASSOCIATED

Batch: \\Organics\LL\LCMSMS02.i\073121-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	31-Jul-2021 12:43:44	073121005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	31-Jul-2021 12:54:21	073121006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	31-Jul-2021 13:04:55	073121007.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ10645-001	31-Jul-2021 13:15:31	073121008.d	MBlk		Soil	1	10645	Surrogates	Smp	0.1100		
2	WQ10645-002	31-Jul-2021 13:26:10	073121009.d	LCS		Soil	1	10645	Analytes	100x PDS	0.1000		
3	WQ10559-001	31-Jul-2021 13:36:46	073121010.d	MBlk		Aqueous	1	10559	Surrogates	Smp	0.1100		MB contaminated with 6:2-FTS
4	WQ10559-002	31-Jul-2021 13:47:25	073121011.d	LCS		Aqueous	1	10559	Analytes	100x PDS	0.2000		6:2(567.9%),rx/ncm affected samples
5	WG30006-001	31-Jul-2021 13:58:05	073121012.d	Client	AFFF21-SB03-00-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
6	WG30006-002	31-Jul-2021 14:08:44	073121013.d	Client	AFFF21-SB03-06-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
7	WG30006-003	31-Jul-2021 14:19:22	073121014.d	Client	AFFF21-SB03-06-072921-01	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
8	WG30006-004	31-Jul-2021 14:30:04	073121015.d	Client	AFFF21-SB03-12-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
9	WG30006-005	31-Jul-2021 14:40:42	073121016.d	Client	AFFF21-SB03-18-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
10	WG30006-006	31-Jul-2021 14:51:21	073121017.d	Client	AFFF21-SB03-24-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
11	WG30006-007	31-Jul-2021 15:02:02	073121018.d	Client	AFFF21-SB03-28-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
12	WG30006-008	31-Jul-2021 15:12:35	073121019.d	Client	AFFF21-GW03-23-072921-00	Aqueous	50	10648	Surrogates	Smp	0.1100		RR-1X
13	WG30006-009	31-Jul-2021 15:23:09	073121020.d	Client	AFFF21-GW03-15-072921-00	Aqueous	50	10648	Surrogates	Smp	0.1100		RR-10X
14	WG29007-003	31-Jul-2021 15:33:43	073121021.d	Client	AFFF21-SB13-12-0728210-0	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
15	ID CCV 1000_SVLC-1573	31-Jul-2021 15:44:21	073121022.d	CCV					Analytes	L-5	1.00		
16	CCB 1	31-Jul-2021 15:55:04	073121023.d	InstBlk					Surrogates	Smp	0.1100		
17	WQ10561-001	31-Jul-2021 16:05:40	073121024.d	MBlk		Soil	1	10561	Surrogates	Smp	0.1100		
18	WQ10561-002	31-Jul-2021 16:16:20	073121025.d	LCS		Soil	1	10561	Analytes	100x PDS	0.1000		
19	WQ10648-001	31-Jul-2021 16:26:57	073121026.d	MBlk		Aqueous	1	10648	Surrogates	Smp	0.1100		6:2-FTS (119.39ng/L), NCM/RX affected samples
20	WQ10648-002	31-Jul-2021 16:37:38	073121027.d	LCS		Aqueous	1	10648	Analytes	100x PDS	0.2000		6:2(148.5%),RX/NCM affected samples
21	WG29007-001	31-Jul-2021 16:48:21	073121028.d	Client	AFFF21-SB13-00-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
22	WG29007-002	31-Jul-2021 16:58:59	073121029.d	Client	AFFF21-SB13-06-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
23	WG29007-004	31-Jul-2021 17:09:34	073121030.d	Client	AFFF21-SB13-18-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
24	WG29007-005	31-Jul-2021 17:20:14	073121031.d	Client	AFFF21-SB13-30-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
25	WG29007-007	31-Jul-2021 17:30:51	073121032.d	Client	AFFF21-SB15-06-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
26	WG29007-009	31-Jul-2021 17:41:26	073121033.d	Client	AFFF21-SB15-30-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
27	WG29007-011	31-Jul-2021 17:52:04	073121034.d	Client	AFFF21-SB01-00-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		RX, SUR: MeFOSAA(LOW),EtFOSAA(LOW)
28	WG29007-012	31-Jul-2021 18:02:47	073121035.d	Client	AFFF21-SB01-09-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		
29	WG29007-013	31-Jul-2021 18:13:24	073121036.d	Client	AFFF21-SB01-09-072821-01	Soil	1	10498	Surrogates	Smp	0.1100		
30	WG22019-003	31-Jul-2021 18:24:03	073121037.d	Client	RRAD-FFTA-02-SE-072021	Soil	10	10065	Surrogates	Smp	0.1100		
31	ID CCV 1000A_SVLC-1573	31-Jul-2021 18:34:45	073121038.d	CCV					Analytes	L-5	1.00		
32	CCB 2	31-Jul-2021 18:45:20	073121039.d	InstBlk					Surrogates	Smp	0.1100		
33	WQ10417-001	31-Jul-2021 18:55:55	073121040.d	MBlk		Aqueous	1	10417	Surrogates	Smp	0.1100		
34	WQ10417-002	31-Jul-2021 19:06:31	073121041.d	LCS		Aqueous	1	10417	Analytes	100x PDS	0.2000		
35	WG22086-005	31-Jul-2021 19:17:10	073121042.d	Client	DPG-PF-01-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
36	WG22086-014	31-Jul-2021 19:27:49	073121043.d	Client	DPG-FD-04-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
37	WG29007-006	31-Jul-2021 19:38:25	073121044.d	Client	AFFF21-SB15-00-0728210-0	Soil	5	10498	Surrogates	Smp	0.1100		
38	WG29007-008	31-Jul-2021 19:49:05	073121045.d	Client	AFFF21-SB15-12-0728210-0	Soil	5	10498	Surrogates	Smp	0.1100		
39	WG24009-001	31-Jul-2021 19:59:43	073121046.d	Client	AOPC22-10J02A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		
40	WG24009-002	31-Jul-2021 20:10:23	073121047.d	Client	AOPC22-10J02A-072221-FD	Aqueous	1	10417	Surrogates	Smp	0.1100		
41	WG24009-003	31-Jul-2021 20:21:03	073121048.d	Client	AOPC5-14D28A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-20X

Report Date: 03-Aug-2021 19:54:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\073121-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
42	WG24009-004	31-Jul-2021 20:31:40	073121049.d	Client	AOPC5-14D36A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-100X, SUR: PFOS(low),PFNA(low)
43	WG24009-005	31-Jul-2021 20:42:20	073121050.d	Client	AOPC22-10J01A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X
44	WG24009-006	31-Jul-2021 20:53:01	073121051.d	Client	AOPC6-14D02A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-100X
45	ID CCV 1000B_SVLC-1573	31-Jul-2021 21:03:38	073121052.d	CCV					Analytes	L-5	1.00		
46	CCB 3	31-Jul-2021 21:14:16	073121053.d	InstBlk					Surrogates	Smp	0.1100		
47	WG30006-001	31-Jul-2021 21:24:57	073121054.d	Client	AFFF21-SB03-00-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
48	WG30006-002	31-Jul-2021 21:35:37	073121055.d	Client	AFFF21-SB03-06-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
49	WG30006-003	31-Jul-2021 21:46:15	073121056.d	Client	AFFF21-SB03-06-072921-01	Soil	1	10645	Surrogates	Smp	0.1100		
50	WG30006-004	31-Jul-2021 21:56:55	073121057.d	Client	AFFF21-SB03-12-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
51	WG30006-005	31-Jul-2021 22:07:35	073121058.d	Client	AFFF21-SB03-18-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
52	WG30006-006	31-Jul-2021 22:18:09	073121059.d	Client	AFFF21-SB03-24-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
53	WG30006-007	31-Jul-2021 22:28:44	073121060.d	Client	AFFF21-SB03-28-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
54	WG30006-008	31-Jul-2021 22:39:20	073121061.d	Client	AFFF21-GW03-23-072921-00	Aqueous	1	10648	Surrogates	Smp	0.1100		SUR: MFOSA(low),TeDA(low),CENTRIFUGED,NCM
55	WG30006-009	31-Jul-2021 22:49:59	073121062.d	Client	AFFF21-GW03-15-072921-00	Aqueous	1	10648	Surrogates	Smp	0.1100		mis-prep, rr-10X
56	WG29007-003	31-Jul-2021 23:00:44	073121063.d	Client	AFFF21-SB13-12-0728210-0	Soil	1	10645	Surrogates	Smp	0.1100		reanalyzed with MS/MSD, not reported
57	ID CCV 1000C_SVLC-1573	31-Jul-2021 23:11:23	073121064.d	CCV					Analytes	L-5	1.00		
58	CCB 4	31-Jul-2021 23:22:02	073121065.d	InstBlk					Surrogates	Smp	0.1100		
59	WG29009-004	31-Jul-2021 23:32:42	073121066.d	Client	AFFF01-FRB-072821-01-T2	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS contamination, rx
60	WG29009-008	31-Jul-2021 23:43:21	073121067.d	Client	AFFF01-FRB-072821-01-T1	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
61	WG29009-009	31-Jul-2021 23:54:01	073121068.d	Client	AFFF01-RB-072821-01-T1	Aqueous	1	10648	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
62	WG29007-010	01-Aug-2021 00:04:43	073121069.d	Client	AFFF21-FRB-01-072821-03-	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
63	WG29007-018	01-Aug-2021 00:15:21	073121070.d	Client	AFFF21-FRB-02-072821-T4	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
64	WG29007-019	01-Aug-2021 00:26:04	073121071.d	Client	AFFF21-RB-01-072821-T4	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
65	ID CCV 1000D_SVLC-1573	01-Aug-2021 00:36:49	073121072.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121005.d
Injection Date: 31-Jul-2021 12:43:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	630797			112	50 - 150
8 PFBA			100.00	105.43	105.4	70 - 130
D 50 13C5_PFPeA	523546	580611			110.9	50 - 150
21 PFPeA			100.00	101.93	101.9	70 - 130
7 PFBS			88.400	93.544	105.8	70 - 130
D 44 13C3_PFBS	169277	180931			106.9	50 - 150
D 63 13C2_4:2 FTS_2	90196	109162			121	50 - 150
1 4:2 FTS			93.400	100.26	107.3	70 - 130
D 49 13C5_PFHxA	600114	669846			111.6	50 - 150
15 PFHxA			100.00	96.354	96.4	70 - 130
22 PFPeS			93.800	90.054	96	70 - 130
28 GenX			200.00	203.51	101.8	70 - 130
D 66 13C3_GenX	1000599	1263013			126.2	50 - 150
D 47 13C4_PFHpA	482787	541026			112.1	50 - 150
13 PFHpA			100.00	87.538	87.5	70 - 130
D 45 13C3_PFHxS	137682	147645			107.2	50 - 150
14 PFHxS			91.000	89.117	97.9	70 - 130
29 ADONA			94.200	101.70	108	70 - 130
D 64 13C2_6:2 FTS_2	77321	93519			120.9	50 - 150
2 6:2 FTS			94.800	149.89	158.1	70 - 130
20 PFOA			100.00	105.94	105.9	70 - 130
D 53 13C8_PFOA	538966	508929			94.4	50 - 150
12 PFHpS			95.200	93.607	98.3	70 - 130
18 PFOS			92.800	87.659	94.5	70 - 130
D 54 13C8_PFOS	139992	147774			105.6	50 - 150
17 PFNA			100.00	112.18	112.2	70 - 130
D 56 13C9_PFNA	618881	632796			102.2	50 - 150
30 9Cl-PF3ONS			93.200	98.786	106	70 - 130
D 55 13C8_PFOSA	250019	286703			114.7	50 - 150
19 PFOSA			100.00	97.563	97.6	70 - 130
16 PFNS			96.000	105.17	109.5	70 - 130
D 65 13C2_8:2 FTS_2	72182	108532			150.4	50 - 150
10 PFDA			100.00	105.97	106	70 - 130
3 8:2 FTS			95.800	92.775	96.8	70 - 130
D 51 13C6_PFDA	590501	617850			104.6	50 - 150
D 58 d3-MeFOSAA	601725	638732			106.2	50 - 150

Report Date: 03-Aug-2021 19:53:30 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	85.626	85.6	70 - 130
9 PFDS			96.400	86.604	89.8	70 - 130
D 52 13C7_PFUdA	707587	671685			94.9	50 - 150
25 PFUdA			100.00	110.97	111	70 - 130
D 60 d5-EtFOSAA	521292	592168			113.6	50 - 150
5 N-EtFOSAA			100.00	76.888	76.9	70 - 130
D 61 d7-MeFOSE	68295	90941			133.2	50 - 150
32 MeFOSE			100.00	98.929	98.9	70 - 130
D 57 d3-MeFOSA	40777	54238			133	50 - 150
26 MeFOSA			100.00	97.800	97.8	70 - 130
31 11Cl-PF3OUDS			94.200	91.365	97	70 - 130
D 62 d9-EtFOSE	68452	95057			138.9	50 - 150
33 EtFOSE			100.00	105.77	105.8	70 - 130
D 59 d5-EtFOSA	38025	51944			136.6	50 - 150
27 EtFOSA			100.00	75.489	75.5	70 - 130
11 PFDoA			100.00	106.68	106.7	70 - 130
D 38 13C2_PFDoA	745164	650962			87.4	50 - 150
4 10:2 FTS			96.400	53.883	55.9	70 - 130
34 PFDOS			96.800	96.142	99.3	70 - 130
24 PFTrDA			100.00	109.95	109.9	70 - 130
23 PFTeDA			100.00	102.52	102.5	70 - 130
D 42 13C2_PFTeDA	846373	953398			112.6	50 - 150
D 40 13C2_PFHxDA	768834	904421			117.6	50 - 150
35 PFHxDA			100.00	121.31	121.3	70 - 130
36 PFODA			100.00	107.65	107.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121006.d
Injection Date: 31-Jul-2021 12:54:21 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	619099			98.1	50 - 150
8 PFBA			200.00	205.22	102.6	70 - 130
D 50 13C5_PFPeA	580611	618368			106.5	50 - 150
21 PFPeA			200.00	200.63	100.3	70 - 130
7 PFBS			176.80	185.02	104.7	70 - 130
D 44 13C3_PFBS	180931	183664			101.5	50 - 150
D 63 13C2_4:2 FTS_2	109162	113013			103.5	50 - 150
1 4:2 FTS			186.80	205.73	110.1	70 - 130
D 49 13C5_PFHxA	669846	637596			95.2	50 - 150
15 PFHxA			200.00	213.37	106.7	70 - 130
22 PFPeS			187.60	173.52	92.5	70 - 130
28 GenX			400.00	400.98	100.2	70 - 130
D 66 13C3_GenX	1263013	1201115			95.1	50 - 150
D 47 13C4_PFHpA	541026	551602			102	50 - 150
13 PFHpA			200.00	200.43	100.2	70 - 130
D 45 13C3_PFHxS	147645	151769			102.8	50 - 150
14 PFHxS			182.00	187.67	103.1	70 - 130
29 ADONA			188.40	192.00	101.9	70 - 130
D 64 13C2_6:2 FTS_2	93519	94950			101.5	50 - 150
2 6:2 FTS			189.60	204.83	108	70 - 130
20 PFOA			200.00	220.04	110	70 - 130
D 53 13C8_PFOA	508929	518622			101.9	50 - 150
12 PFHpS			190.40	184.80	97.1	70 - 130
18 PFOS			185.60	190.07	102.4	70 - 130
D 54 13C8_PFOS	147774	148532			100.5	50 - 150
17 PFNA			200.00	202.95	101.5	70 - 130
D 56 13C9_PFNA	632796	685491			108.3	50 - 150
30 9Cl-PF3ONS			186.40	172.17	92.4	70 - 130
D 55 13C8_PFOSA	286703	311015			108.5	50 - 150
19 PFOSA			200.00	188.73	94.4	70 - 130
16 PFNS			192.00	228.92	119.2	70 - 130
D 65 13C2_8:2 FTS_2	108532	106801			98.4	50 - 150
10 PFDA			200.00	204.16	102.1	70 - 130
3 8:2 FTS			191.60	168.90	88.1	70 - 130
D 51 13C6_PFDA	617850	613585			99.3	50 - 150
D 58 d3-MeFOSAA	638732	634434			99.3	50 - 150

Report Date: 03-Aug-2021 19:53:31 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	216.47	108.2	70 - 130
9 PFDS			192.80	193.32	100.3	70 - 130
D 52 13C7_PFUdA	671685	676160			100.7	50 - 150
25 PFUdA			200.00	217.55	108.8	70 - 130
D 60 d5-EtFOSAA	592168	647982			109.4	50 - 150
5 N-EtFOSAA			200.00	165.56	82.8	70 - 130
D 61 d7-MeFOSE	90941	85494			94	50 - 150
32 MeFOSE			200.00	202.87	101.4	70 - 130
D 57 d3-MeFOSA	54238	49825			91.9	50 - 150
26 MeFOSA			200.00	261.95	131	70 - 130
31 11Cl-PF3OUDS			188.40	186.11	98.8	70 - 130
D 62 d9-EtFOSE	95057	98725			103.9	50 - 150
33 EtFOSE			200.00	171.63	85.8	70 - 130
D 59 d5-EtFOSA	51944	48708			93.8	50 - 150
27 EtFOSA			200.00	210.35	105.2	70 - 130
11 PFDoA			200.00	195.63	97.8	70 - 130
D 38 13C2_PFDoA	650962	701514			107.8	50 - 150
4 10:2 FTS			192.80	110.61	57.4	70 - 130
34 PFDOS			193.60	201.90	104.3	70 - 130
24 PFTrDA			200.00	212.32	106.2	70 - 130
23 PFTeDA			200.00	200.05	100	70 - 130
D 42 13C2_PFTeDA	953398	949684			99.6	50 - 150
D 40 13C2_PFHxDA	904421	927933			102.6	50 - 150
35 PFHxDA			200.00	214.64	107.3	70 - 130
36 PFODA			200.00	207.85	103.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121022.d
Injection Date: 31-Jul-2021 15:44:21 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 15
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	630973			100	50 - 150
8 PFBA			1000.00	936.95	93.7	70 - 130
D 50 13C5_PFPeA	580611	592809			102.1	50 - 150
21 PFPeA			1000.00	916.31	91.6	70 - 130
7 PFBS			884.00	816.31	92.3	70 - 130
D 44 13C3_PFBS	180931	175276			96.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	100278			91.9	50 - 150
1 4:2 FTS			934.00	937.36	100.4	70 - 130
D 49 13C5_PFHxA	669846	649347			96.9	50 - 150
15 PFHxA			1000.00	919.28	91.9	70 - 130
22 PFPeS			938.00	888.80	94.8	70 - 130
28 GenX			2000.00	2016.60	100.8	70 - 130
D 66 13C3_GenX	1263013	1083830			85.8	50 - 150
D 47 13C4_PFHpA	541026	572100			105.7	50 - 150
13 PFHpA			1000.00	872.65	87.3	70 - 130
D 45 13C3_PFHxS	147645	150185			101.7	50 - 150
14 PFHxS			910.00	885.58	97.3	70 - 130
29 ADONA			942.00	906.93	96.3	70 - 130
D 64 13C2_6:2 FTS_2	93519	88211			94.3	50 - 150
2 6:2 FTS			948.00	964.75	101.8	70 - 130
20 PFOA			1000.00	953.99	95.4	70 - 130
D 53 13C8_PFOA	508929	520145			102.2	50 - 150
12 PFHpS			952.00	856.88	90	70 - 130
18 PFOS			928.00	805.03	86.7	70 - 130
D 54 13C8_PFOS	147774	162770			110.1	50 - 150
17 PFNA			1000.00	888.34	88.8	70 - 130
D 56 13C9_PFNA	632796	671445			106.1	50 - 150
30 9Cl-PF3ONS			932.00	784.93	84.2	70 - 130
D 55 13C8_PFOSA	286703	282327			98.5	50 - 150
19 PFOSA			1000.00	988.67	98.9	70 - 130
16 PFNS			960.00	830.65	86.5	70 - 130
D 65 13C2_8:2 FTS_2	108532	100566			92.7	50 - 150
10 PFDA			1000.00	972.27	97.2	70 - 130
3 8:2 FTS			958.00	923.73	96.4	70 - 130
D 51 13C6_PFDA	617850	591496			95.7	50 - 150
D 58 d3-MeFOSAA	638732	594065			93	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1031.61	103.2	70 - 130
9 PFDS			964.00	832.38	86.3	70 - 130
D 52 13C7_PFUdA	671685	650908			96.9	50 - 150
25 PFUdA			1000.00	935.26	93.5	70 - 130
D 60 d5-EtFOSAA	592168	571978			96.6	50 - 150
5 N-EtFOSAA			1000.00	910.60	91.1	70 - 130
D 61 d7-MeFOSE	90941	87272			96	50 - 150
32 MeFOSE			1000.00	913.52	91.4	70 - 130
D 57 d3-MeFOSA	54238	46582			85.9	50 - 150
26 MeFOSA			1000.00	1247.55	124.8	70 - 130
31 11Cl-PF3OUDS			942.00	776.58	82.4	70 - 130
D 62 d9-EtFOSE	95057	96999			102	50 - 150
33 EtFOSE			1000.00	888.15	88.8	70 - 130
D 59 d5-EtFOSA	51944	45661			87.9	50 - 150
27 EtFOSA			1000.00	1028.63	102.9	70 - 130
11 PFDoA			1000.00	939.83	94	70 - 130
D 38 13C2_PFDoA	650962	656771			100.9	50 - 150
4 10:2 FTS			964.00	620.37	64.4	70 - 130
34 PFDOS			968.00	858.94	88.7	70 - 130
24 PFTrDA			1000.00	1081.08	108.1	70 - 130
23 PFTeDA			1000.00	954.48	95.4	70 - 130
D 42 13C2_PFTeDA	953398	963862			101.1	50 - 150
D 40 13C2_PFHxDA	904421	840486			92.9	50 - 150
35 PFHxDA			1000.00	1061.54	106.2	70 - 130
36 PFODA			1000.00	1031.99	103.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121038.d
Injection Date: 31-Jul-2021 18:34:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	661563			104.9	50 - 150
8 PFBA			1000.00	912.07	91.2	70 - 130
D 50 13C5_PFPeA	580611	625866			107.8	50 - 150
21 PFPeA			1000.00	882.34	88.2	70 - 130
7 PFBS			884.00	837.32	94.7	70 - 130
D 44 13C3_PFBS	180931	186339			103	50 - 150
D 63 13C2_4:2 FTS_2	109162	102087			93.5	50 - 150
1 4:2 FTS			934.00	983.44	105.3	70 - 130
D 49 13C5_PFHxA	669846	710604			106.1	50 - 150
15 PFHxA			1000.00	860.82	86.1	70 - 130
22 PFPeS			938.00	900.57	96	70 - 130
28 GenX			2000.00	1996.46	99.8	70 - 130
D 66 13C3_GenX	1263013	1108881			87.8	50 - 150
D 47 13C4_PFHpA	541026	562782			104	50 - 150
13 PFHpA			1000.00	922.12	92.2	70 - 130
D 45 13C3_PFHxS	147645	161712			109.5	50 - 150
14 PFHxS			910.00	819.06	90	70 - 130
29 ADONA			942.00	886.02	94.1	70 - 130
D 64 13C2_6:2 FTS_2	93519	84286			90.1	50 - 150
2 6:2 FTS			948.00	1013.53	106.9	70 - 130
20 PFOA			1000.00	927.95	92.8	70 - 130
D 53 13C8_PFOA	508929	546469			107.4	50 - 150
12 PFHpS			952.00	880.02	92.4	70 - 130
18 PFOS			928.00	867.63	93.5	70 - 130
D 54 13C8_PFOS	147774	157144			106.3	50 - 150
17 PFNA			1000.00	921.91	92.2	70 - 130
D 56 13C9_PFNA	632796	688784			108.8	50 - 150
30 9Cl-PF3ONS			932.00	908.05	97.4	70 - 130
D 55 13C8_PFOSA	286703	286613			100	50 - 150
19 PFOSA			1000.00	1008.82	100.9	70 - 130
16 PFNS			960.00	874.86	91.1	70 - 130
D 65 13C2_8:2 FTS_2	108532	112533			103.7	50 - 150
10 PFDA			1000.00	948.99	94.9	70 - 130
3 8:2 FTS			958.00	759.96	79.3	70 - 130
D 51 13C6_PFDA	617850	680491			110.1	50 - 150
D 58 d3-MeFOSAA	638732	643641			100.8	50 - 150

Report Date: 03-Aug-2021 19:53:49 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121038.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1083.23	108.3	70 - 130
9 PFDS			964.00	901.61	93.5	70 - 130
D 52 13C7_PFUdA	671685	709590			105.6	50 - 150
25 PFUdA			1000.00	994.30	99.4	70 - 130
D 60 d5-EtFOSAA	592168	605884			102.3	50 - 150
5 N-EtFOSAA			1000.00	968.89	96.9	70 - 130
D 61 d7-MeFOSE	90941	89425			98.3	50 - 150
32 MeFOSE			1000.00	963.18	96.3	70 - 130
D 57 d3-MeFOSA	54238	54577			100.6	50 - 150
26 MeFOSA			1000.00	1186.25	118.6	70 - 130
31 11Cl-PF3OUDS			942.00	863.86	91.7	70 - 130
D 62 d9-EtFOSE	95057	104249			109.7	50 - 150
33 EtFOSE			1000.00	899.77	90	70 - 130
D 59 d5-EtFOSA	51944	49490			95.3	50 - 150
27 EtFOSA			1000.00	997.76	99.8	70 - 130
11 PFDoA			1000.00	949.68	95	70 - 130
D 38 13C2_PFDoA	650962	684192			105.1	50 - 150
4 10:2 FTS			964.00	576.79	59.8	70 - 130
34 PFDOS			968.00	948.96	98	70 - 130
24 PFTrDA			1000.00	1071.77	107.2	70 - 130
23 PFTeDA			1000.00	895.99	89.6	70 - 130
D 42 13C2_PFTeDA	953398	1069874			112.2	50 - 150
D 40 13C2_PFHxDA	904421	877595			97	50 - 150
35 PFHxDA			1000.00	1052.77	105.3	70 - 130
36 PFODA			1000.00	1029.79	103	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121052.d
Injection Date: 31-Jul-2021 21:03:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 45
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	623063			98.8	50 - 150
8 PFBA			1000.00	938.76	93.9	70 - 130
D 50 13C5_PFPeA	580611	601785			103.6	50 - 150
21 PFPeA			1000.00	883.31	88.3	70 - 130
7 PFBS			884.00	818.38	92.6	70 - 130
D 44 13C3_PFBS	180931	177055			97.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	98533			90.3	50 - 150
1 4:2 FTS			934.00	898.37	96.2	70 - 130
D 49 13C5_PFHxA	669846	656607			98	50 - 150
15 PFHxA			1000.00	953.73	95.4	70 - 130
22 PFPeS			938.00	874.58	93.2	70 - 130
28 GenX			2000.00	1872.71	93.6	70 - 130
D 66 13C3_GenX	1263013	1120587			88.7	50 - 150
D 47 13C4_PFHpA	541026	554336			102.5	50 - 150
13 PFHpA			1000.00	857.30	85.7	70 - 130
D 45 13C3_PFHxS	147645	151993			102.9	50 - 150
14 PFHxS			910.00	824.27	90.6	70 - 130
29 ADONA			942.00	882.86	93.7	70 - 130
D 64 13C2_6:2 FTS_2	93519	85319			91.2	50 - 150
2 6:2 FTS			948.00	1038.91	109.6	70 - 130
20 PFOA			1000.00	971.27	97.1	70 - 130
D 53 13C8_PFOA	508929	520093			102.2	50 - 150
12 PFHpS			952.00	875.94	92	70 - 130
18 PFOS			928.00	937.47	101	70 - 130
D 54 13C8_PFOS	147774	144303			97.7	50 - 150
17 PFNA			1000.00	901.63	90.2	70 - 130
D 56 13C9_PFNA	632796	679562			107.4	50 - 150
30 9Cl-PF3ONS			932.00	926.44	99.4	70 - 130
D 55 13C8_PFOSA	286703	285565			99.6	50 - 150
19 PFOSA			1000.00	992.08	99.2	70 - 130
16 PFNS			960.00	945.32	98.5	70 - 130
D 65 13C2_8:2 FTS_2	108532	101289			93.3	50 - 150
10 PFDA			1000.00	944.01	94.4	70 - 130
3 8:2 FTS			958.00	820.56	85.7	70 - 130
D 51 13C6_PFDA	617850	603695			97.7	50 - 150
D 58 d3-MeFOSAA	638732	632027			99	50 - 150

Report Date: 03-Aug-2021 19:53:56 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121052.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1022.68	102.3	70 - 130
9 PFDS			964.00	1010.99	104.9	70 - 130
D 52 13C7_PFUdA	671685	663294			98.8	50 - 150
25 PFUdA			1000.00	932.33	93.2	70 - 130
D 60 d5-EtFOSAA	592168	563082			95.1	50 - 150
5 N-EtFOSAA			1000.00	1036.26	103.6	70 - 130
D 61 d7-MeFOSE	90941	83760			92.1	50 - 150
32 MeFOSE			1000.00	944.12	94.4	70 - 130
D 57 d3-MeFOSA	54238	51039			94.1	50 - 150
26 MeFOSA			1000.00	1059.77	106	70 - 130
31 11Cl-PF3OUDS			942.00	854.23	90.7	70 - 130
D 62 d9-EtFOSE	95057	97268			102.3	50 - 150
33 EtFOSE			1000.00	918.90	91.9	70 - 130
D 59 d5-EtFOSA	51944	44439			85.6	50 - 150
27 EtFOSA			1000.00	1110.29	111	70 - 130
11 PFDoA			1000.00	989.17	98.9	70 - 130
D 38 13C2_PFDoA	650962	622140			95.6	50 - 150
4 10:2 FTS			964.00	565.46	58.7	70 - 130
34 PFDOS			968.00	948.32	98	70 - 130
24 PFTrDA			1000.00	1145.24	114.5	70 - 130
23 PFTeDA			1000.00	928.19	92.8	70 - 130
D 42 13C2_PFTeDA	953398	938135			98.4	50 - 150
D 40 13C2_PFHxDA	904421	856460			94.7	50 - 150
35 PFHxDA			1000.00	1051.03	105.1	70 - 130
36 PFODA			1000.00	1011.31	101.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121064.d
Injection Date: 31-Jul-2021 23:11:23 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 57
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	659616			104.6	50 - 150
8 PFBA			1000.00	955.95	95.6	70 - 130
D 50 13C5_PFPeA	580611	641109			110.4	50 - 150
21 PFPeA			1000.00	932.10	93.2	70 - 130
7 PFBS			884.00	809.60	91.6	70 - 130
D 44 13C3_PFBS	180931	195271			107.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	100302			91.9	50 - 150
1 4:2 FTS			934.00	1002.23	107.3	70 - 130
D 49 13C5_PFHxA	669846	723344			108	50 - 150
15 PFHxA			1000.00	853.19	85.3	70 - 130
22 PFPeS			938.00	850.70	90.7	70 - 130
28 GenX			2000.00	2016.37	100.8	70 - 130
D 66 13C3_GenX	1263013	1184450			93.8	50 - 150
D 47 13C4_PFHpA	541026	594092			109.8	50 - 150
13 PFHpA			1000.00	845.60	84.6	70 - 130
D 45 13C3_PFHxS	147645	167862			113.7	50 - 150
14 PFHxS			910.00	806.56	88.6	70 - 130
29 ADONA			942.00	871.73	92.5	70 - 130
D 64 13C2_6:2 FTS_2	93519	90904			97.2	50 - 150
2 6:2 FTS			948.00	979.31	103.3	70 - 130
20 PFOA			1000.00	1014.23	101.4	70 - 130
D 53 13C8_PFOA	508929	549893			108	50 - 150
12 PFHpS			952.00	878.71	92.3	70 - 130
18 PFOS			928.00	867.09	93.4	70 - 130
D 54 13C8_PFOS	147774	166585			112.7	50 - 150
17 PFNA			1000.00	907.59	90.8	70 - 130
D 56 13C9_PFNA	632796	734455			116.1	50 - 150
30 9Cl-PF3ONS			932.00	815.24	87.5	70 - 130
D 55 13C8_PFOSA	286703	306730			107	50 - 150
19 PFOSA			1000.00	1005.87	100.6	70 - 130
16 PFNS			960.00	845.70	88.1	70 - 130
D 65 13C2_8:2 FTS_2	108532	104122			95.9	50 - 150
10 PFDA			1000.00	847.68	84.8	70 - 130
3 8:2 FTS			958.00	952.38	99.4	70 - 130
D 51 13C6_PFDA	617850	718232			116.2	50 - 150
D 58 d3-MeFOSAA	638732	631226			98.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1055.69	105.6	70 - 130
9 PFDS			964.00	858.33	89	70 - 130
D 52 13C7_PFUdA	671685	754230			112.3	50 - 150
25 PFUdA			1000.00	939.78	94	70 - 130
D 60 d5-EtFOSAA	592168	598063			101	50 - 150
5 N-EtFOSAA			1000.00	1001.42	100.1	70 - 130
D 61 d7-MeFOSE	90941	83481			91.8	50 - 150
32 MeFOSE			1000.00	1036.03	103.6	70 - 130
D 57 d3-MeFOSA	54238	50069			92.3	50 - 150
26 MeFOSA			1000.00	1174.79	117.5	70 - 130
31 11Cl-PF3OUDS			942.00	865.35	91.9	70 - 130
D 62 d9-EtFOSE	95057	104693			110.1	50 - 150
33 EtFOSE			1000.00	867.32	86.7	70 - 130
D 59 d5-EtFOSA	51944	52139			100.4	50 - 150
27 EtFOSA			1000.00	1066.76	106.7	70 - 130
11 PFDoA			1000.00	1017.09	101.7	70 - 130
D 38 13C2_PFDoA	650962	699334			107.4	50 - 150
4 10:2 FTS			964.00	725.40	75.2	70 - 130
34 PFDOS			968.00	895.15	92.5	70 - 130
24 PFTrDA			1000.00	1104.07	110.4	70 - 130
23 PFTeDA			1000.00	856.59	85.7	70 - 130
D 42 13C2_PFTeDA	953398	1131177			118.6	50 - 150
D 40 13C2_PFHxDA	904421	943368			104.3	50 - 150
35 PFHxDA			1000.00	1085.13	108.5	70 - 130
36 PFODA			1000.00	1024.25	102.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121072.d
Injection Date: 01-Aug-2021 00:36:49 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 65
Sample Info: ID CCV 1000D_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	685378			108.7	50 - 150
8 PFBA			1000.00	926.89	92.7	70 - 130
D 50 13C5_PFPeA	580611	650218			112	50 - 150
21 PFPeA			1000.00	879.27	87.9	70 - 130
7 PFBS			884.00	783.26	88.6	70 - 130
D 44 13C3_PFBS	180931	205782			113.7	50 - 150
D 63 13C2_4:2 FTS_2	109162	99884			91.5	50 - 150
1 4:2 FTS			934.00	1062.33	113.7	70 - 130
D 49 13C5_PFHxA	669846	746812			111.5	50 - 150
15 PFHxA			1000.00	854.67	85.5	70 - 130
22 PFPeS			938.00	754.46	80.4	70 - 130
28 GenX			2000.00	2018.65	100.9	70 - 130
D 66 13C3_GenX	1263013	1208923			95.7	50 - 150
D 47 13C4_PFHpA	541026	590171			109.1	50 - 150
13 PFHpA			1000.00	939.31	93.9	70 - 130
D 45 13C3_PFHxS	147645	174499			118.2	50 - 150
14 PFHxS			910.00	779.90	85.7	70 - 130
29 ADONA			942.00	846.07	89.8	70 - 130
D 64 13C2_6:2 FTS_2	93519	96789			103.5	50 - 150
2 6:2 FTS			948.00	1035.28	109.2	70 - 130
20 PFOA			1000.00	970.89	97.1	70 - 130
D 53 13C8_PFOA	508929	564751			111	50 - 150
12 PFHpS			952.00	816.79	85.8	70 - 130
18 PFOS			928.00	857.78	92.4	70 - 130
D 54 13C8_PFOS	147774	162659			110.1	50 - 150
17 PFNA			1000.00	950.29	95	70 - 130
D 56 13C9_PFNA	632796	704499			111.3	50 - 150
30 9Cl-PF3ONS			932.00	846.36	90.8	70 - 130
D 55 13C8_PFOSA	286703	291887			101.8	50 - 150
19 PFOSA			1000.00	1025.10	102.5	70 - 130
16 PFNS			960.00	877.73	91.4	70 - 130
D 65 13C2_8:2 FTS_2	108532	109938			101.3	50 - 150
10 PFDA			1000.00	968.24	96.8	70 - 130
3 8:2 FTS			958.00	923.65	96.4	70 - 130
D 51 13C6_PFDA	617850	661395			107	50 - 150
D 58 d3-MeFOSAA	638732	663613			103.9	50 - 150

Report Date: 03-Aug-2021 19:54:08 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121072.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	999.05	99.9	70 - 130
9 PFDS			964.00	1004.42	104.2	70 - 130
D 52 13C7_PFUdA	671685	738423			109.9	50 - 150
25 PFUdA			1000.00	920.43	92	70 - 130
D 60 d5-EtFOSAA	592168	609303			102.9	50 - 150
5 N-EtFOSAA			1000.00	958.67	95.9	70 - 130
D 61 d7-MeFOSE	90941	85167			93.7	50 - 150
32 MeFOSE			1000.00	1023.20	102.3	70 - 130
D 57 d3-MeFOSA	54238	55678			102.7	50 - 150
26 MeFOSA			1000.00	1221.62	122.2	70 - 130
31 11Cl-PF3OUDS			942.00	853.32	90.6	70 - 130
D 62 d9-EtFOSE	95057	112654			118.5	50 - 150
33 EtFOSE			1000.00	871.79	87.2	70 - 130
D 59 d5-EtFOSA	51944	49786			95.8	50 - 150
27 EtFOSA			1000.00	1067.92	106.8	70 - 130
11 PFDoA			1000.00	1041.78	104.2	70 - 130
D 38 13C2_PFDoA	650962	703014			108	50 - 150
4 10:2 FTS			964.00	627.59	65.1	70 - 130
34 PFDOS			968.00	907.38	93.7	70 - 130
24 PFTrDA			1000.00	1090.36	109	70 - 130
23 PFTeDA			1000.00	928.40	92.8	70 - 130
D 42 13C2_PFTeDA	953398	1039288			109	50 - 150
D 40 13C2_PFHxDA	904421	913959			101.1	50 - 150
35 PFHxDA			1000.00	1066.12	106.6	70 - 130
36 PFODA			1000.00	1025.79	102.6	70 - 130

Report Date: 04-Aug-2021 17:53:52 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\080321-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	03-Aug-2021 12:56:26	080321005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	03-Aug-2021 13:07:03	080321006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	03-Aug-2021 13:17:37	080321007.d	InstBlk					Surrogates	Smp	0.1100		
1	WG30020-005	03-Aug-2021 13:28:15	080321008.d	Client	AFFF01-SB28-02-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
2	WG30020-006	03-Aug-2021 13:38:51	080321009.d	Client	AFFF01-SB28-17-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
3	WG30020-007	03-Aug-2021 13:49:30	080321010.d	Client	AFFF01-SB28-05-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
4	WG30020-008	03-Aug-2021 14:00:10	080321011.d	Client	AFFF01-SB25-02-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
5	WG30020-009	03-Aug-2021 14:10:48	080321012.d	Client	AFFF01-SB25-10-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
6	WG30020-010	03-Aug-2021 14:21:26	080321013.d	Client	AFFF01-SB25-07-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
7	WG30020-011	03-Aug-2021 14:32:02	080321014.d	Client	AFFF01-SB13-01-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
8	WG30020-012	03-Aug-2021 14:42:44	080321015.d	Client	AFFF01-SB13-18-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
9	WG30020-013	03-Aug-2021 14:53:22	080321016.d	Client	AFFF01-SB13-12-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
10	WG30006-009	03-Aug-2021 15:04:02	080321017.d	Client	AFFF21-GW03-15-072921-00	Aqueous	10	10648	Surrogates	Smp	0.1100		
11	ID SUR 100PPB_SVLC-1591	03-Aug-2021 15:14:43	080321018.d	Client		Aqueous	1		Surrogates	Smp	0.1100		
12	ID CCV 1000_SVLC-1573	03-Aug-2021 15:25:18	080321019.d	CCV					Analytes	L-5	1.00		
13	CCB 1	03-Aug-2021 15:35:53	080321020.d	InstBlk					Surrogates	Smp	0.1100		
14	WG29007-014	03-Aug-2021 15:46:27	080321021.d	Client	AFFF21-SB01-12-072821-01	Soil	1	10561	Surrogates	Smp	0.1100		
15	WG29007-015	03-Aug-2021 15:57:04	080321022.d	Client	AFFF21-SB01-18-072821-00	Soil	1	10561	Surrogates	Smp	0.1100		
16	WG29007-016	03-Aug-2021 16:07:43	080321023.d	Client	AFFF21-SB01-22-072821-00	Soil	1	10561	Surrogates	Smp	0.1100		
17	WG29009-001	03-Aug-2021 16:18:20	080321024.d	Client	AFFF01-SW01-072821-00-T2	Aqueous	1	10648	Surrogates	Smp	0.1100		
18	WG29009-001MS	03-Aug-2021 16:28:55	080321025.d	MS		Aqueous	1	10648	Analytes	100x PDS	0.2000		
19	WG29009-001MD	03-Aug-2021 16:39:32	080321026.d	MSD		Aqueous	1	10648	Analytes	100x PDS	0.2000		
20	ID IBLK B	03-Aug-2021 16:50:12	080321027.d	InstBlk					Surrogates	Smp	0.1100		
21	WG20004-020	03-Aug-2021 17:00:52	080321028.d	Client	AOPC5-14D12A-071621	Aqueous	1	10648	Surrogates	Smp	0.1100		
22	WG20004-021	03-Aug-2021 17:11:28	080321029.d	Client	AOPC5-14D12A-071621-FD	Aqueous	1	10648	Surrogates	Smp	0.1100		
23	WG22011-001	03-Aug-2021 17:22:04	080321030.d	Client	AOPC24-W89-1-071921	Aqueous	1	10648	Surrogates	Smp	0.1100		
24	WG22011-002	03-Aug-2021 17:32:42	080321031.d	Client	AOPC3-W7-3-071921	Aqueous	1	10648	Surrogates	Smp	0.1100		
25	WG29009-002	03-Aug-2021 17:43:17	080321032.d	Client	AFFF01-SW01-072821-01-T2	Aqueous	1	10559	Surrogates	Smp	0.1100		SUR: UdA(low),DoA(low),TeDA(low),RX
26	WG29009-003	03-Aug-2021 17:53:54	080321033.d	Client	AFFF01-SW02-072821-01-T2	Aqueous	1	10559	Surrogates	Smp	0.1100		
27	ID CCV 1000A_SVLC-1573	03-Aug-2021 18:04:35	080321034.d	CCV					Analytes	L-5	1.00		
28	CCB 2	03-Aug-2021 18:15:17	080321035.d	InstBlk					Surrogates	Smp	0.1100		
29	WG30020-005	03-Aug-2021 18:25:56	080321036.d	Client	AFFF01-SB28-02-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
30	WG30020-006	03-Aug-2021 18:36:35	080321037.d	Client	AFFF01-SB28-17-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
31	WG30020-007	03-Aug-2021 18:47:17	080321038.d	Client	AFFF01-SB28-05-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
32	WG30020-008	03-Aug-2021 18:57:52	080321039.d	Client	AFFF01-SB25-02-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
33	WG30020-009	03-Aug-2021 19:08:26	080321040.d	Client	AFFF01-SB25-10-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
34	WG30020-010	03-Aug-2021 19:19:02	080321041.d	Client	AFFF01-SB25-07-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
35	WG30020-011	03-Aug-2021 19:29:40	080321042.d	Client	AFFF01-SB13-01-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		RR-5X
36	WG30020-012	03-Aug-2021 19:40:19	080321043.d	Client	AFFF01-SB13-18-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
37	WG30020-013	03-Aug-2021 19:50:57	080321044.d	Client	AFFF01-SB13-12-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
38	WG29007-003	03-Aug-2021 20:01:39	080321045.d	Client	AFFF21-SB13-12-0728210-0	Soil	1	10645	Surrogates	Smp	0.1100		
39	WG29007-003MS	03-Aug-2021 20:12:18	080321046.d	MS		Soil	1	10645	Analytes	100x PDS	0.1000		
40	WG29007-003MD	03-Aug-2021 20:23:01	080321047.d	MSD		Soil	1	10645	Analytes	100x PDS	0.1000		
41	ID CCV 1000B_SVLC-1573	03-Aug-2021 20:33:44	080321048.d	CCV					Analytes	L-5	1.00		

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
42	CCB 3	03-Aug-2021 20:44:22	080321049.d	InstBlk					Surrogates	Smp	0.1100		
43	WQ10883-001	03-Aug-2021 20:54:58	080321050.d	MBlk		Soil	1	10883	Surrogates	Smp	0.1100		
44	WQ10883-101	03-Aug-2021 21:05:39	080321051.d	MBlk		Soil	1	10883	Surrogates	Smp	0.1100		
45	WQ10883-002	03-Aug-2021 21:16:19	080321052.d	LCS		Soil	1	10883	Analytes	100x PDS	0.1000		
46	WQ10883-102	03-Aug-2021 21:26:56	080321053.d	LCS		Soil	1	10883	Analytes	100x PDS	0.1000		
47	WG29024-001	03-Aug-2021 21:37:36	080321054.d	Client	PFAS in Soil	Soil	1	10561	Surrogates	Smp	0.1100		
48	ID IBLK D	03-Aug-2021 21:48:19	080321055.d	InstBlk					Surrogates	Smp	0.1100		
49	WQ10747-001	03-Aug-2021 21:58:57	080321056.d	MBlk		Aqueous	1	10747	Surrogates	Smp	0.1100		
50	WQ10747-002	03-Aug-2021 22:09:37	080321057.d	LCS		Aqueous	1	10747	Analytes	100x PDS	0.2000		
51	WG30020-014	03-Aug-2021 22:20:17	080321058.d	Client	AFFF01-RB-01-072921-T1	Aqueous	1	10747	Surrogates	Smp	0.1100		
52	WG30020-015	03-Aug-2021 22:30:52	080321059.d	Client	AFFF01-RB-01-072921-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		
53	WG30020-016	03-Aug-2021 22:41:27	080321060.d	Client	AFFF01-FRB-01-072921-T1	Aqueous	1	10747	Surrogates	Smp	0.1100		
54	WG30051-001	03-Aug-2021 22:52:04	080321061.d	Client	AFFF21-FRB-03-072921-T4	Aqueous	1	10747	Surrogates	Smp	0.1100		
55	WG30051-002	03-Aug-2021 23:02:44	080321062.d	Client	AFFF21-RB-02-072921-T4	Aqueous	1	10747	Surrogates	Smp	0.1100		
56	ID CCV 1000C_SVLC-1573	03-Aug-2021 23:13:28	080321063.d	CCV					Analytes	L-5	1.00		
48	ID IBLK E	03-Aug-2021 23:24:10	080321064.d	InstBlk					Surrogates	Smp	0.1100		
57	ID SUR 100ppb_SVLC-1591	03-Aug-2021 23:34:47	080321065.d	Client		Aqueous	1		Surrogates	Smp	0.1100		CLEAN, GOOD TO USE
58	WG30020-002	03-Aug-2021 23:45:36	080321066.d	Client	AFFF01-SW03-072921-00-T2	Aqueous	50	10747	Surrogates	Smp	0.1100		RR-5X
59	WG30020-003	03-Aug-2021 23:56:17	080321067.d	Client	AFFF01-SW04-072921-00-T2	Aqueous	50	10747	Surrogates	Smp	0.1100		RR-1X
60	WG30020-004	04-Aug-2021 00:06:57	080321068.d	Client	AFFF01-SW05-072921-00-T2	Aqueous	50	10747	Surrogates	Smp	0.1100		RR-1X
61	WG24008-001	04-Aug-2021 00:17:39	080321069.d	Client	AOPC20-SW01-EF-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
62	WG24008-002	04-Aug-2021 00:28:19	080321070.d	Client	AOPC13-SW01-IN-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-50X
63	WG24008-003	04-Aug-2021 00:38:57	080321071.d	Client	AOPC13-SW01-EF-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
64	WG24008-004	04-Aug-2021 00:49:36	080321072.d	Client	AOPC13-SW01-EF-072221-FD	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
65	WG24008-005	04-Aug-2021 01:00:17	080321073.d	Client	AOPC15-SW01-EF-072321	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
66	WG24008-006	04-Aug-2021 01:10:55	080321074.d	Client	AOPC15-SW01-IN-072321	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
67	WG24009-007	04-Aug-2021 01:21:36	080321075.d	Client	AOPC1,6,7-14C60A-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-10X
68	WG24009-008	04-Aug-2021 01:32:18	080321076.d	Client	FB-12-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
69	WG24009-009	04-Aug-2021 01:42:59	080321077.d	Client	AOPC17,21-EXW-4-072321	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
70	WG24009-010	04-Aug-2021 01:53:41	080321078.d	Client	AOPC18-A-072321	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
71	WG24009-011	04-Aug-2021 02:04:23	080321079.d	Client	FB-13-072321	Aqueous	50	10417	Surrogates	Smp	0.1100		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080321-DOD.b\080321034.d
Injection Date: 03-Aug-2021 18:04:35 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 27
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	632053	674672			106.7	50 - 150
8 PFBA			1000.00	921.34	92.1	70 - 130
D 50 13C5_PFPeA	587380	634283			108	50 - 150
21 PFPeA			1000.00	892.00	89.2	70 - 130
7 PFBS			884.00	817.69	92.5	70 - 130
D 44 13C3_PFBS	185561	198491			107	50 - 150
D 63 13C2_4:2 FTS_2	117580	108191			92	50 - 150
1 4:2 FTS			934.00	1042.66	111.6	70 - 130
D 49 13C5_PFHxA	681320	740393			108.7	50 - 150
15 PFHxA			1000.00	840.25	84	70 - 130
22 PFPeS			938.00	852.89	90.9	70 - 130
28 GenX			2000.00	1879.59	94	70 - 130
D 66 13C3_GenX	1270258	1228114			96.7	50 - 150
D 47 13C4_PFHpA	550029	583250			106	50 - 150
13 PFHpA			1000.00	891.17	89.1	70 - 130
D 45 13C3_PFHxS	156336	149915			95.9	50 - 150
14 PFHxS			910.00	906.97	99.7	70 - 130
29 ADONA			942.00	1011.50	107.4	70 - 130
D 64 13C2_6:2 FTS_2	98076	92647			94.5	50 - 150
2 6:2 FTS			948.00	1097.89	115.8	70 - 130
20 PFOA			1000.00	937.66	93.8	70 - 130
D 53 13C8_PFOA	508794	555132			109.1	50 - 150
12 PFHpS			952.00	926.53	97.3	70 - 130
18 PFOS			928.00	818.39	88.2	70 - 130
D 54 13C8_PFOS	144116	166469			115.5	50 - 150
17 PFNA			1000.00	887.33	88.7	70 - 130
D 56 13C9_PFNA	681866	729948			107.1	50 - 150
30 9Cl-PF3ONS			932.00	836.16	89.7	70 - 130
D 55 13C8_PFOSA	296770	311300			104.9	50 - 150
19 PFOSA			1000.00	914.13	91.4	70 - 130
16 PFNS			960.00	814.39	84.8	70 - 130
D 65 13C2_8:2 FTS_2	96550	101239			104.9	50 - 150
10 PFDA			1000.00	883.13	88.3	70 - 130
3 8:2 FTS			958.00	939.73	98.1	70 - 130
D 51 13C6_PFDA	623361	705129			113.1	50 - 150
D 58 d3-MeFOSAA	758375	708021			93.4	50 - 150

Report Date: 04-Aug-2021 17:53:25 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\080321-DOD.b\080321034.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1080.26	108	70 - 130
9 PFDS			964.00	848.44	88	70 - 130
D 52 13C7_PFUdA	706573	709861			100.5	50 - 150
25 PFUdA			1000.00	988.62	98.9	70 - 130
D 60 d5-EtFOSAA	690905	655469			94.9	50 - 150
5 N-EtFOSAA			1000.00	1003.02	100.3	70 - 130
D 61 d7-MeFOSE	92916	84808			91.3	50 - 150
32 MeFOSE			1000.00	988.68	98.9	70 - 130
D 57 d3-MeFOSA	53005	53889			101.7	50 - 150
26 MeFOSA			1000.00	1055.80	105.6	70 - 130
31 11Cl-PF3OUDS			942.00	820.43	87.1	70 - 130
D 62 d9-EtFOSE	102346	94890			92.7	50 - 150
33 EtFOSE			1000.00	1013.81	101.4	70 - 130
D 59 d5-EtFOSA	49795	49299			99	50 - 150
27 EtFOSA			1000.00	1024.21	102.4	70 - 130
11 PFDoA			1000.00	957.55	95.8	70 - 130
D 38 13C2_PFDoA	701120	691730			98.7	50 - 150
4 10:2 FTS			964.00	607.75	63	70 - 130
34 PFDOS			968.00	894.55	92.4	70 - 130
24 PFTrDA			1000.00	1116.99	111.7	70 - 130
23 PFTeDA			1000.00	904.53	90.5	70 - 130
D 42 13C2_PFTeDA	980046	1068761			109.1	50 - 150
D 40 13C2_PFHxDA	951974	945765			99.3	50 - 150
35 PFHxDA			1000.00	1057.69	105.8	70 - 130
36 PFODA			1000.00	1059.88	106	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080321-DOD.b\080321048.d
Injection Date: 03-Aug-2021 20:33:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 41
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	632053	672562			106.4	50 - 150
8 PFBA			1000.00	923.33	92.3	70 - 130
D 50 13C5_PFPeA	587380	642460			109.4	50 - 150
21 PFPeA			1000.00	938.20	93.8	70 - 130
7 PFBS			884.00	760.50	86	70 - 130
D 44 13C3_PFBS	185561	209813			113.1	50 - 150
D 63 13C2_4:2 FTS_2	117580	107634			91.5	50 - 150
1 4:2 FTS			934.00	1083.56	116	70 - 130
D 49 13C5_PFHxA	681320	751096			110.2	50 - 150
15 PFHxA			1000.00	831.50	83.2	70 - 130
22 PFPeS			938.00	827.86	88.3	70 - 130
28 GenX			2000.00	1873.31	93.7	70 - 130
D 66 13C3_GenX	1270258	1206697			95	50 - 150
D 47 13C4_PFHpA	550029	583307			106.1	50 - 150
13 PFHpA			1000.00	875.22	87.5	70 - 130
D 45 13C3_PFHxS	156336	164460			105.2	50 - 150
14 PFHxS			910.00	866.43	95.2	70 - 130
29 ADONA			942.00	862.79	91.6	70 - 130
D 64 13C2_6:2 FTS_2	98076	88209			89.9	50 - 150
2 6:2 FTS			948.00	1157.47	122.1	70 - 130
20 PFOA			1000.00	907.50	90.7	70 - 130
D 53 13C8_PFOA	508794	568583			111.8	50 - 150
12 PFHpS			952.00	904.71	95	70 - 130
18 PFOS			928.00	814.87	87.8	70 - 130
D 54 13C8_PFOS	144116	169192			117.4	50 - 150
17 PFNA			1000.00	896.52	89.7	70 - 130
D 56 13C9_PFNA	681866	732863			107.5	50 - 150
30 9Cl-PF3ONS			932.00	839.18	90	70 - 130
D 55 13C8_PFOSA	296770	314016			105.8	50 - 150
19 PFOSA			1000.00	966.41	96.6	70 - 130
16 PFNS			960.00	854.55	89	70 - 130
D 65 13C2_8:2 FTS_2	96550	106231			110	50 - 150
10 PFDA			1000.00	991.13	99.1	70 - 130
3 8:2 FTS			958.00	842.78	88	70 - 130
D 51 13C6_PFDA	623361	668998			107.3	50 - 150
D 58 d3-MeFOSAA	758375	734552			96.9	50 - 150

Report Date: 04-Aug-2021 17:53:35 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\080321-DOD.b\080321048.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1082.01	108.2	70 - 130
9 PFDS			964.00	912.96	94.7	70 - 130
D 52 13C7_PFUdA	706573	726412			102.8	50 - 150
25 PFUdA			1000.00	963.92	96.4	70 - 130
D 60 d5-EtFOSAA	690905	712363			103.1	50 - 150
5 N-EtFOSAA			1000.00	883.12	88.3	70 - 130
D 61 d7-MeFOSE	92916	92390			99.4	50 - 150
32 MeFOSE			1000.00	988.19	98.8	70 - 130
D 57 d3-MeFOSA	53005	59362			112	50 - 150
26 MeFOSA			1000.00	1019.69	102	70 - 130
31 11Cl-PF3OUDS			942.00	834.70	88.6	70 - 130
D 62 d9-EtFOSE	102346	107036			104.6	50 - 150
33 EtFOSE			1000.00	850.20	85	70 - 130
D 59 d5-EtFOSA	49795	49634			99.7	50 - 150
27 EtFOSA			1000.00	954.18	95.4	70 - 130
11 PFDoA			1000.00	912.66	91.3	70 - 130
D 38 13C2_PFDoA	701120	731980			104.4	50 - 150
4 10:2 FTS			964.00	628.92	65.2	70 - 130
34 PFDOS			968.00	890.84	92	70 - 130
24 PFTrDA			1000.00	1014.29	101.4	70 - 130
23 PFTeDA			1000.00	875.45	87.5	70 - 130
D 42 13C2_PFTeDA	980046	1092629			111.5	50 - 150
D 40 13C2_PFHxDA	951974	984544			103.4	50 - 150
35 PFHxDA			1000.00	1046.76	104.7	70 - 130
36 PFODA			1000.00	1012.96	101.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080321-DOD.b\080321063.d
Injection Date: 03-Aug-2021 23:13:28 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 56
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	632053	627600			99.3	50 - 150
8 PFBA			1000.00	948.24	94.8	70 - 130
D 50 13C5_PFPeA	587380	599635			102.1	50 - 150
21 PFPeA			1000.00	946.02	94.6	70 - 130
7 PFBS			884.00	827.67	93.6	70 - 130
D 44 13C3_PFBS	185561	190677			102.8	50 - 150
D 63 13C2_4:2 FTS_2	117580	102881			87.5	50 - 150
1 4:2 FTS			934.00	856.39	91.7	70 - 130
D 49 13C5_PFHxA	681320	699441			102.7	50 - 150
15 PFHxA			1000.00	965.13	96.5	70 - 130
22 PFPeS			938.00	799.11	85.2	70 - 130
28 GenX			2000.00	1960.98	98	70 - 130
D 66 13C3_GenX	1270258	1136387			89.5	50 - 150
D 47 13C4_PFHpA	550029	530486			96.4	50 - 150
13 PFHpA			1000.00	952.90	95.3	70 - 130
D 45 13C3_PFHxS	156336	164889			105.5	50 - 150
14 PFHxS			910.00	782.43	86	70 - 130
29 ADONA			942.00	865.86	91.9	70 - 130
D 64 13C2_6:2 FTS_2	98076	88782			90.5	50 - 150
2 6:2 FTS			948.00	1066.63	112.5	70 - 130
20 PFOA			1000.00	964.02	96.4	70 - 130
D 53 13C8_PFOA	508794	534739			105.1	50 - 150
12 PFHpS			952.00	830.61	87.2	70 - 130
18 PFOS			928.00	807.87	87.1	70 - 130
D 54 13C8_PFOS	144116	154830			107.4	50 - 150
17 PFNA			1000.00	951.20	95.1	70 - 130
D 56 13C9_PFNA	681866	666995			97.8	50 - 150
30 9Cl-PF3ONS			932.00	864.07	92.7	70 - 130
D 55 13C8_PFOSA	296770	286739			96.6	50 - 150
19 PFOSA			1000.00	1023.42	102.3	70 - 130
16 PFNS			960.00	860.29	89.6	70 - 130
D 65 13C2_8:2 FTS_2	96550	96817			100.3	50 - 150
10 PFDA			1000.00	920.98	92.1	70 - 130
3 8:2 FTS			958.00	874.99	91.3	70 - 130
D 51 13C6_PFDA	623361	645883			103.6	50 - 150
D 58 d3-MeFOSAA	758375	719488			94.9	50 - 150

Report Date: 04-Aug-2021 17:53:43 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\080321-DOD.b\080321063.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1008.79	100.9	70 - 130
9 PFDS			964.00	927.54	96.2	70 - 130
D 52 13C7_PFUdA	706573	709101			100.4	50 - 150
25 PFUdA			1000.00	914.78	91.5	70 - 130
D 60 d5-EtFOSAA	690905	720363			104.3	50 - 150
5 N-EtFOSAA			1000.00	895.13	89.5	70 - 130
D 61 d7-MeFOSE	92916	87953			94.7	50 - 150
32 MeFOSE			1000.00	955.77	95.6	70 - 130
D 57 d3-MeFOSA	53005	54494			102.8	50 - 150
26 MeFOSA			1000.00	1078.67	107.9	70 - 130
31 11Cl-PF3OUDS			942.00	865.20	91.8	70 - 130
D 62 d9-EtFOSE	102346	98330			96.1	50 - 150
33 EtFOSE			1000.00	988.04	98.8	70 - 130
D 59 d5-EtFOSA	49795	45820			92	50 - 150
27 EtFOSA			1000.00	1048.75	104.9	70 - 130
11 PFDoA			1000.00	968.77	96.9	70 - 130
D 38 13C2_PFDoA	701120	662792			94.5	50 - 150
4 10:2 FTS			964.00	643.11	66.7	70 - 130
34 PFDOS			968.00	883.35	91.3	70 - 130
24 PFTrDA			1000.00	1063.66	106.4	70 - 130
23 PFTeDA			1000.00	912.84	91.3	70 - 130
D 42 13C2_PFTeDA	980046	1024873			104.6	50 - 150
D 40 13C2_PFHxDA	951974	918790			96.5	50 - 150
35 PFHxDA			1000.00	1076.57	107.7	70 - 130
36 PFODA			1000.00	1036.16	103.6	70 - 130

Report Date: 09-Aug-2021 19:40:13 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

NO SAMPLES ASSOCIATED

Batch: \\organics\LL\LCMSMS02.i\080421-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	04-Aug-2021 12:17:56	080421005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	04-Aug-2021 12:28:33	080421006.d	CCV					Analytes	L-3	1.00		
98	ID IBLK A	04-Aug-2021 12:49:43	080421008.d	InstBlk					Surrogates	Smp	0.1100		
2	WQ10851-002	04-Aug-2021 13:11:01	080421010.d	LCS		Aqueous	1		Analytes	100x PDS	0.2000		
3	WQ10972-001	04-Aug-2021 13:21:34	080421011.d	MBlk		Aqueous	1	10972	Surrogates	Smp	0.1100		ADONA @ 1.79; 6:2 @ 3.95ng/L
4	WQ10972-002	04-Aug-2021 13:32:15	080421012.d	LCS		Aqueous	1	10972	Analytes	100x PDS	0.2000		ADONA/6:2 HIGH - MANIFOLD CONT?
5	WQ10799-001	04-Aug-2021 13:42:50	080421013.d	MBlk		Aqueous	1	10799	Surrogates	Smp	0.1100		
6	WQ10799-004	04-Aug-2021 13:53:25	080421014.d	MBlk		Aqueous	1	10799	Surrogates	Smp	0.1100		
7	WQ10799-002	04-Aug-2021 14:04:02	080421015.d	LCS		Aqueous	1	10799	Surrogates	Smp	0.1100		
8	WQ10799-003	04-Aug-2021 14:14:45	080421016.d	LCSD		Aqueous	1	10799	Surrogates	Smp	0.1100		
9	WQ10799-104	04-Aug-2021 14:25:23	080421017.d	LCS		Aqueous	1	10799	Analytes	100x PDS	0.2000		
10	WG20004-014	04-Aug-2021 14:36:01	080421018.d	Client	AOPC3-W7-9-071421	Aqueous	1	10799	Surrogates	Smp	0.1100		
11	WG31020-010	04-Aug-2021 14:46:43	080421019.d	Client	AFFF01-FRB-02-073021-T1	Aqueous	1	10799	Surrogates	Smp	0.1100		
12	WG31020-015	04-Aug-2021 14:57:18	080421020.d	Client	AFFF01-FRB-01-073021-T2	Aqueous	1	10799	Surrogates	Smp	0.1100		
13	WG28008-006	04-Aug-2021 15:07:52	080421021.d	Client	ASTC-DECON-(072721)	Aqueous	1	10799	Surrogates	Smp	0.1100		
14	WG29004-001	04-Aug-2021 15:18:25	080421022.d	Client	FTKX-FB-1-072721	Aqueous	1	10799	Surrogates	Smp	0.1100		
15	WG29004-002	04-Aug-2021 15:29:02	080421023.d	Client	FTKX-EB-1-072721	Aqueous	1	10799	Surrogates	Smp	0.1100		
16	WG29004-007	04-Aug-2021 15:39:41	080421024.d	Client	FTKX-FD-1-SW-072721	Aqueous	1	10799	Surrogates	Smp	0.1100		sur: TeDA(low), RX
17	ID CCV 1000_SVLC-1573	04-Aug-2021 15:50:19	080421025.d	CCV					Analytes	L-5	1.00		
18	CCB 1	04-Aug-2021 16:00:58	080421026.d	InstBlk					Surrogates	Smp	0.1100		
19	WG30020-003	04-Aug-2021 16:11:34	080421027.d	Client	AFFF01-SW04-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		RR-1X(6:2)
20	WG30020-004	04-Aug-2021 16:22:16	080421028.d	Client	AFFF01-SW05-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		6:2 ND, NCM
21	WG30020-004DU	04-Aug-2021 16:32:55	080421029.d	Client		Aqueous	1	10747	Surrogates	Smp	0.1100		6:2 ND, NCM
22	WG24008-001	04-Aug-2021 16:43:33	080421030.d	Client	AOPC20-SW01-EF-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
23	WG24008-003	04-Aug-2021 16:54:08	080421031.d	Client	AOPC13-SW01-EF-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
24	WG24008-004	04-Aug-2021 17:04:46	080421032.d	Client	AOPC13-SW01-EF-072221-FD	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
25	WG24008-005	04-Aug-2021 17:15:23	080421033.d	Client	AOPC15-SW01-EF-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
26	WG24008-005MS	04-Aug-2021 17:25:58	080421034.d	MS		Aqueous	1	10417	Analytes	100x PDS	0.2000		
27	WG24008-005MD	04-Aug-2021 17:36:37	080421035.d	MSD		Aqueous	1	10417	Analytes	100x PDS	0.2000		
28	WG24009-008	04-Aug-2021 17:47:17	080421036.d	Client	FB-12-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
29	WG24009-009	04-Aug-2021 17:57:55	080421037.d	Client	AOPC17,21-EXW-4-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
30	WG24009-010	04-Aug-2021 18:08:35	080421038.d	Client	AOPC18-A-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
31	ID CCV 1000A_SVLC-1573	04-Aug-2021 18:19:17	080421039.d	CCV					Analytes	L-5	1.00		6:2(130.9%), RR/NCM affected samples
32	CCB 2	04-Aug-2021 18:29:52	080421040.d	InstBlk					Surrogates	Smp	0.1100		
33	WG24008-006	04-Aug-2021 18:40:28	080421041.d	Client	AOPC15-SW01-IN-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
34	WG24009-011	04-Aug-2021 18:51:03	080421042.d	Client	FB-13-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
35	WG30020-002	04-Aug-2021 19:01:42	080421043.d	Client	AFFF01-SW03-072921-00-T2	Aqueous	5	10747	Surrogates	Smp	0.1100		RR-1X
36	WG30020-002MS	04-Aug-2021 19:12:20	080421044.d	MS		Aqueous	5	10747	Analytes	100x PDS	0.2000		
37	WG30020-011	04-Aug-2021 19:22:57	080421045.d	Client	AFFF01-SB13-01-072921-00	Soil	5	10645	Surrogates	Smp	0.1100		RR-5X(6:2)
38	WG24009-007	04-Aug-2021 19:33:40	080421046.d	Client	AOPC1,6,7-14C60A-072221	Aqueous	10	10417	Surrogates	Smp	0.1100		RR-5X(6:2)
39	WG24009-003	04-Aug-2021 19:44:18	080421047.d	Client	AOPC5-14D28A-072221	Aqueous	20	10417	Surrogates	Smp	0.1100		RR-20X(6:2)
40	WG24008-002	04-Aug-2021 19:54:57	080421048.d	Client	AOPC13-SW01-IN-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-50x(6:2)
41	WG24009-004	04-Aug-2021 20:05:40	080421049.d	Client	AOPC5-14D36A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		RR-100X(6:2)
42	WG24009-006	04-Aug-2021 20:16:18	080421050.d	Client	AOPC6-14D02A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		RR-100X(6:2)

Report Date: 09-Aug-2021 19:40:13 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\organics\LL\LCMSMS02.i\080421-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
43	ID CCV 1000B_SVLC-1573	04-Aug-2021 20:26:55	080421051.d	CCV					Analytes	L-5	1.00		
44	CCB 3	04-Aug-2021 20:37:35	080421052.d	InstBlk					Surrogates	Smp	0.1100		
45	WQ11005-001	04-Aug-2021 20:48:12	080421053.d	MBlk		Aqueous	1	11005	Surrogates	Smp	0.1100		
46	WQ11005-002	04-Aug-2021 20:58:49	080421054.d	LCS		Aqueous	1	11005	Analytes	100x PDS	0.0200		
47	WQ11005-003	04-Aug-2021 21:09:32	080421055.d	LCSD		Aqueous	1	11005	Analytes	100x PDS	0.0200		
48	WQ11005-102	04-Aug-2021 21:20:15	080421056.d	LCS		Aqueous	1	11005	Analytes	10x PDS	0.0200		
49	WQ11005-103	04-Aug-2021 21:30:54	080421057.d	LCSD		Aqueous	1	11005	Analytes	10x PDS	0.0200		
50	WH03029-001	04-Aug-2021 21:41:33	080421058.d	Client	1-0-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		
51	WH03029-002	04-Aug-2021 21:52:14	080421059.d	Client	1-1-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		
52	WH03029-003	04-Aug-2021 22:02:49	080421060.d	Client	1-2-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		sur: BA(low),insufficient sample,NCM
53	WH03029-004	04-Aug-2021 22:13:26	080421061.d	Client	1-3-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		
54	WH03029-005	04-Aug-2021 22:24:01	080421062.d	Client	5-0-A	Aqueous	1	11005	Surrogates	Smp	0.1100		
55	WG29003-001	04-Aug-2021 22:34:45	080421063.d	Client	FTKX-FSDB-3-SO-0-2-07272	Soil	1	10498	Surrogates	Smp	0.1100		
56	WG29003-002	04-Aug-2021 22:45:24	080421064.d	Client	FTKX-FSDB-5-SO-2-3-07272	Soil	1	10498	Surrogates	Smp	0.1100		
57	WG29003-004	04-Aug-2021 22:56:04	080421065.d	Client	FTKX-SP-38-072721	Aqueous	1	10559	Surrogates	Smp	0.1100		sur: TeDA(LOW), CONFIRMED BY MS/MSD,NCM
58	WG29003-004MS	04-Aug-2021 23:06:43	080421066.d	MS		Aqueous	1	10559	Surrogates	Smp	0.1100		
59	WG29003-004MD	04-Aug-2021 23:17:22	080421067.d	MSD		Aqueous	1	10559	Surrogates	Smp	0.1100		
60	ID CCV 1000C_SVLC-1573	04-Aug-2021 23:28:01	080421068.d	CCV					Analytes	L-5	1.00		
61	WG24010-006	04-Aug-2021 23:38:41	080421069.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
62	WG24010-007	04-Aug-2021 23:49:21	080421070.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
63	WG24010-008	04-Aug-2021 23:59:59	080421071.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
64	WG24010-009	05-Aug-2021 00:10:40	080421072.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
65	WG24010-010	05-Aug-2021 00:21:18	080421073.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
66	WG23021-001	05-Aug-2021 00:31:56	080421074.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
67	WG23021-002	05-Aug-2021 00:42:35	080421075.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
68	WG23021-003	05-Aug-2021 00:53:15	080421076.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
69	WG23021-004	05-Aug-2021 01:03:55	080421077.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
70	WG23021-005	05-Aug-2021 01:14:37	080421078.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
71	WG23021-006	05-Aug-2021 01:25:19	080421079.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
72	WG23073-002	05-Aug-2021 01:35:49	080421080.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
73	WG23024-001	05-Aug-2021 01:46:19	080421081.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
74	WG24010-001	05-Aug-2021 01:56:50	080421082.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
75	WG24010-002	05-Aug-2021 02:07:33	080421083.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
76	WG22022-001	05-Aug-2021 02:18:15	080421084.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
77	WG27023-001	05-Aug-2021 02:28:56	080421085.d	Client		Aqueous	50		Surrogates	Smp	0.1100		RR-5X
78	WG24010-003	05-Aug-2021 02:39:38	080421086.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
79	WG24010-004	05-Aug-2021 02:50:17	080421087.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
80	WG24010-005	05-Aug-2021 03:01:00	080421088.d	Client		Aqueous	50		Surrogates	Smp	0.1100		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421005.d
Injection Date: 04-Aug-2021 12:17:56 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	627821			111.5	50 - 150
8 PFBA			100.00	106.23	106.2	70 - 130
D 50 13C5_PFPeA	523546	594861			113.6	50 - 150
21 PFPeA			100.00	104.33	104.3	70 - 130
7 PFBS			88.400	79.859	90.3	70 - 130
D 44 13C3_PFBS	169277	191316			113	50 - 150
D 63 13C2_4:2 FTS_2	90196	113853			126.2	50 - 150
1 4:2 FTS			93.400	102.09	109.3	70 - 130
D 49 13C5_PFHxA	600114	699983			116.6	50 - 150
15 PFHxA			100.00	96.520	96.5	70 - 130
22 PFPeS			93.800	92.609	98.7	70 - 130
28 GenX			200.00	234.28	117.1	70 - 130
D 66 13C3_GenX	1000599	1232176			123.1	50 - 150
D 47 13C4_PFHpA	482787	563315			116.7	50 - 150
13 PFHpA			100.00	96.178	96.2	70 - 130
D 45 13C3_PFHxS	137682	162707			118.2	50 - 150
14 PFHxS			91.000	89.810	98.7	70 - 130
29 ADONA			94.200	85.090	90.3	70 - 130
D 64 13C2_6:2 FTS_2	77321	94624			122.4	50 - 150
2 6:2 FTS			94.800	140.21	147.9	70 - 130
20 PFOA			100.00	113.13	113.1	70 - 130
D 53 13C8_PFOA	538966	520722			96.6	50 - 150
12 PFHpS			95.200	83.832	88.1	70 - 130
18 PFOS			92.800	75.514	81.4	70 - 130
D 54 13C8_PFOS	139992	155583			111.1	50 - 150
17 PFNA			100.00	97.418	97.4	70 - 130
D 56 13C9_PFNA	618881	683223			110.4	50 - 150
30 9Cl-PF3ONS			93.200	87.315	93.7	70 - 130
D 55 13C8_PFOSA	250019	335834			134.3	50 - 150
19 PFOSA			100.00	96.022	96	70 - 130
16 PFNS			96.000	88.213	91.9	70 - 130
D 65 13C2_8:2 FTS_2	72182	109751			152	50 - 150
10 PFDA			100.00	100.08	100.1	70 - 130
3 8:2 FTS			95.800	90.853	94.8	70 - 130
D 51 13C6_PFDA	590501	632664			107.1	50 - 150
D 58 d3-MeFOSAA	601725	796771			132.4	50 - 150

Report Date: 05-Aug-2021 18:39:10 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	103.16	103.2	70 - 130
9 PFDS			96.400	90.171	93.5	70 - 130
D 52 13C7_PFUdA	707587	654046			92.4	50 - 150
25 PFUdA			100.00	105.63	105.6	70 - 130
D 60 d5-EtFOSAA	521292	676164			129.7	50 - 150
5 N-EtFOSAA			100.00	103.62	103.6	70 - 130
D 61 d7-MeFOSE	68295	81562			119.4	50 - 150
32 MeFOSE			100.00	107.41	107.4	70 - 130
D 57 d3-MeFOSA	40777	50898			124.8	50 - 150
26 MeFOSA			100.00	135.36	135.4	70 - 130
31 11Cl-PF3OUDS			94.200	86.062	91.4	70 - 130
D 62 d9-EtFOSE	68452	105638			154.3	50 - 150
33 EtFOSE			100.00	112.41	112.4	70 - 130
D 59 d5-EtFOSA	38025	45744			120.3	50 - 150
27 EtFOSA			100.00	87.401	87.4	70 - 130
11 PFDoA			100.00	100.59	100.6	70 - 130
D 38 13C2_PFDoA	745164	722764			97	50 - 150
4 10:2 FTS			96.400	57.971	60.1	70 - 130
34 PFDOS			96.800	104.58	108	70 - 130
24 PFTrDA			100.00	108.49	108.5	70 - 130
23 PFTeDA			100.00	103.92	103.9	70 - 130
D 42 13C2_PFTeDA	846373	1022490			120.8	50 - 150
D 40 13C2_PFHxDA	768834	983864			128	50 - 150
35 PFHxDA			100.00	111.08	111.1	70 - 130
36 PFODA			100.00	102.94	102.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421006.d
Injection Date: 04-Aug-2021 12:28:33 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	626953			99.9	50 - 150
8 PFBA			200.00	216.75	108.4	70 - 130
D 50 13C5_PFPeA	594861	597098			100.4	50 - 150
21 PFPeA			200.00	196.29	98.1	70 - 130
7 PFBS			176.80	182.10	103	70 - 130
D 44 13C3_PFBS	191316	189948			99.3	50 - 150
D 63 13C2_4:2 FTS_2	113853	121584			106.8	50 - 150
1 4:2 FTS			186.80	168.94	90.4	70 - 130
D 49 13C5_PFHxA	699983	690179			98.6	50 - 150
15 PFHxA			200.00	210.78	105.4	70 - 130
22 PFPeS			187.60	185.49	98.9	70 - 130
28 GenX			400.00	380.34	95.1	70 - 130
D 66 13C3_GenX	1232176	1271693			103.2	50 - 150
D 47 13C4_PFHpA	563315	550332			97.7	50 - 150
13 PFHpA			200.00	180.72	90.4	70 - 130
D 45 13C3_PFHxS	162707	152605			93.8	50 - 150
14 PFHxS			182.00	172.20	94.6	70 - 130
29 ADONA			188.40	196.01	104	70 - 130
D 64 13C2_6:2 FTS_2	94624	99579			105.2	50 - 150
2 6:2 FTS			189.60	224.92	118.6	70 - 130
20 PFOA			200.00	219.57	109.8	70 - 130
D 53 13C8_PFOA	520722	528847			101.6	50 - 150
12 PFHpS			190.40	206.46	108.4	70 - 130
18 PFOS			185.60	185.39	99.9	70 - 130
D 54 13C8_PFOS	155583	152075			97.7	50 - 150
17 PFNA			200.00	205.59	102.8	70 - 130
D 56 13C9_PFNA	683223	675589			98.9	50 - 150
30 9Cl-PF3ONS			186.40	192.68	103.4	70 - 130
D 55 13C8_PFOSA	335834	326589			97.2	50 - 150
19 PFOSA			200.00	200.42	100.2	70 - 130
16 PFNS			192.00	194.28	101.2	70 - 130
D 65 13C2_8:2 FTS_2	109751	110281			100.5	50 - 150
10 PFDA			200.00	218.92	109.5	70 - 130
3 8:2 FTS			191.60	195.89	102.2	70 - 130
D 51 13C6_PFDA	632664	634461			100.3	50 - 150
D 58 d3-MeFOSAA	796771	764302			95.9	50 - 150

Report Date: 05-Aug-2021 18:39:11 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	211.18	105.6	70 - 130
9 PFDS			192.80	181.79	94.3	70 - 130
D 52 13C7_PFUdA	654046	693045			106	50 - 150
25 PFUdA			200.00	196.96	98.5	70 - 130
D 60 d5-EtFOSAA	676164	697660			103.2	50 - 150
5 N-EtFOSAA			200.00	179.38	89.7	70 - 130
D 61 d7-MeFOSE	81562	88988			109.1	50 - 150
32 MeFOSE			200.00	219.72	109.9	70 - 130
D 57 d3-MeFOSA	50898	56608			111.2	50 - 150
26 MeFOSA			200.00	241.39	120.7	70 - 130
31 11Cl-PF3OUDS			188.40	178.57	94.8	70 - 130
D 62 d9-EtFOSE	105638	103567			98	50 - 150
33 EtFOSE			200.00	166.18	83.1	70 - 130
D 59 d5-EtFOSA	45744	46198			101	50 - 150
27 EtFOSA			200.00	223.12	111.6	70 - 130
11 PFDoA			200.00	196.25	98.1	70 - 130
D 38 13C2_PFDoA	722764	717304			99.2	50 - 150
4 10:2 FTS			192.80	118.55	61.5	70 - 130
34 PFDOS			193.60	199.99	103.3	70 - 130
24 PFTrDA			200.00	227.68	113.8	70 - 130
23 PFTeDA			200.00	193.79	96.9	70 - 130
D 42 13C2_PFTeDA	1022490	1043732			102.1	50 - 150
D 40 13C2_PFHxDA	983864	1008178			102.5	50 - 150
35 PFHxDA			200.00	217.28	108.6	70 - 130
36 PFODA			200.00	208.91	104.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421025.d
Injection Date: 04-Aug-2021 15:50:19 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 17
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	674504			107.4	50 - 150
8 PFBA			1000.00	922.26	92.2	70 - 130
D 50 13C5_PFPeA	594861	647586			108.9	50 - 150
21 PFPeA			1000.00	866.77	86.7	70 - 130
7 PFBS			884.00	815.95	92.3	70 - 130
D 44 13C3_PFBS	191316	202893			106.1	50 - 150
D 63 13C2_4:2 FTS_2	113853	116685			102.5	50 - 150
1 4:2 FTS			934.00	1005.49	107.7	70 - 130
D 49 13C5_PFHxA	699983	706835			101	50 - 150
15 PFHxA			1000.00	927.08	92.7	70 - 130
22 PFPeS			938.00	856.28	91.3	70 - 130
28 GenX			2000.00	1819.21	91	70 - 130
D 66 13C3_GenX	1232176	1250182			101.5	50 - 150
D 47 13C4_PFHpA	563315	622469			110.5	50 - 150
13 PFHpA			1000.00	870.85	87.1	70 - 130
D 45 13C3_PFHxS	162707	166597			102.4	50 - 150
14 PFHxS			910.00	858.35	94.3	70 - 130
29 ADONA			942.00	907.07	96.3	70 - 130
D 64 13C2_6:2 FTS_2	94624	90068			95.2	50 - 150
2 6:2 FTS			948.00	1187.45	125.3	70 - 130
20 PFOA			1000.00	931.57	93.2	70 - 130
D 53 13C8_PFOA	520722	563553			108.2	50 - 150
12 PFHpS			952.00	858.86	90.2	70 - 130
18 PFOS			928.00	859.93	92.7	70 - 130
D 54 13C8_PFOS	155583	165152			106.2	50 - 150
17 PFNA			1000.00	946.84	94.7	70 - 130
D 56 13C9_PFNA	683223	695758			101.8	50 - 150
30 9Cl-PF3ONS			932.00	861.47	92.4	70 - 130
D 55 13C8_PFOSA	335834	286082			85.2	50 - 150
19 PFOSA			1000.00	1013.34	101.3	70 - 130
16 PFNS			960.00	836.35	87.1	70 - 130
D 65 13C2_8:2 FTS_2	109751	100974			92	50 - 150
10 PFDA			1000.00	848.20	84.8	70 - 130
3 8:2 FTS			958.00	941.74	98.3	70 - 130
D 51 13C6_PFDA	632664	680660			107.6	50 - 150
D 58 d3-MeFOSAA	796771	745982			93.6	50 - 150

Report Date: 05-Aug-2021 18:39:26 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421025.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1063.75	106.4	70 - 130
9 PFDS			964.00	925.26	96	70 - 130
D 52 13C7_PFUdA	654046	810613			123.9	50 - 150
25 PFUdA			1000.00	832.61	83.3	70 - 130
D 60 d5-EtFOSAA	676164	692730			102.4	50 - 150
5 N-EtFOSAA			1000.00	975.02	97.5	70 - 130
D 61 d7-MeFOSE	81562	87121			106.8	50 - 150
32 MeFOSE			1000.00	1066.14	106.6	70 - 130
D 57 d3-MeFOSA	50898	52628			103.4	50 - 150
26 MeFOSA			1000.00	1094.00	109.4	70 - 130
31 11Cl-PF3OUDS			942.00	878.21	93.2	70 - 130
D 62 d9-EtFOSE	105638	101672			96.2	50 - 150
33 EtFOSE			1000.00	928.90	92.9	70 - 130
D 59 d5-EtFOSA	45744	49479			108.2	50 - 150
27 EtFOSA			1000.00	1000.76	100.1	70 - 130
11 PFDoA			1000.00	900.75	90.1	70 - 130
D 38 13C2_PFDoA	722764	729690			101	50 - 150
4 10:2 FTS			964.00	572.67	59.4	70 - 130
34 PFDOS			968.00	903.23	93.3	70 - 130
24 PFTrDA			1000.00	1031.79	103.2	70 - 130
23 PFTeDA			1000.00	937.97	93.8	70 - 130
D 42 13C2_PFTeDA	1022490	1040010			101.7	50 - 150
D 40 13C2_PFHxDA	983864	952729			96.8	50 - 150
35 PFHxDA			1000.00	1056.29	105.6	70 - 130
36 PFODA			1000.00	1024.08	102.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421039.d
Injection Date: 04-Aug-2021 18:19:17 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	687846			109.6	50 - 150
8 PFBA			1000.00	934.59	93.5	70 - 130
D 50 13C5_PFPeA	594861	663496			111.5	50 - 150
21 PFPeA			1000.00	914.47	91.4	70 - 130
7 PFBS			884.00	774.29	87.6	70 - 130
D 44 13C3_PFBS	191316	216780			113.3	50 - 150
D 63 13C2_4:2 FTS_2	113853	106230			93.3	50 - 150
1 4:2 FTS			934.00	1047.05	112.1	70 - 130
D 49 13C5_PFHxA	699983	771560			110.2	50 - 150
15 PFHxA			1000.00	880.06	88	70 - 130
22 PFPeS			938.00	833.61	88.9	70 - 130
28 GenX			2000.00	1986.83	99.3	70 - 130
D 66 13C3_GenX	1232176	1263846			102.6	50 - 150
D 47 13C4_PFHpA	563315	589510			104.7	50 - 150
13 PFHpA			1000.00	932.60	93.3	70 - 130
D 45 13C3_PFHxS	162707	175846			108.1	50 - 150
14 PFHxS			910.00	817.19	89.8	70 - 130
29 ADONA			942.00	900.75	95.6	70 - 130
D 64 13C2_6:2 FTS_2	94624	92999			98.3	50 - 150
2 6:2 FTS			948.00	1240.51	130.9	70 - 130
20 PFOA			1000.00	935.83	93.6	70 - 130
D 53 13C8_PFOA	520722	598506			114.9	50 - 150
12 PFHpS			952.00	883.11	92.8	70 - 130
18 PFOS			928.00	853.90	92	70 - 130
D 54 13C8_PFOS	155583	178390			114.7	50 - 150
17 PFNA			1000.00	905.56	90.6	70 - 130
D 56 13C9_PFNA	683223	751203			109.9	50 - 150
30 9Cl-PF3ONS			932.00	832.52	89.3	70 - 130
D 55 13C8_PFOSA	335834	332349			99	50 - 150
19 PFOSA			1000.00	971.98	97.2	70 - 130
16 PFNS			960.00	859.17	89.5	70 - 130
D 65 13C2_8:2 FTS_2	109751	109775			100	50 - 150
10 PFDA			1000.00	934.72	93.5	70 - 130
3 8:2 FTS			958.00	1027.31	107.2	70 - 130
D 51 13C6_PFDA	632664	761622			120.4	50 - 150
D 58 d3-MeFOSAA	796771	774583			97.2	50 - 150

Report Date: 05-Aug-2021 18:39:37 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421039.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1111.17	111.1	70 - 130
9 PFDS			964.00	915.02	94.9	70 - 130
D 52 13C7_PFUdA	654046	756488			115.7	50 - 150
25 PFUdA			1000.00	916.96	91.7	70 - 130
D 60 d5-EtFOSAA	676164	711308			105.2	50 - 150
5 N-EtFOSAA			1000.00	1015.07	101.5	70 - 130
D 61 d7-MeFOSE	81562	92288			113.2	50 - 150
32 MeFOSE			1000.00	1053.18	105.3	70 - 130
D 57 d3-MeFOSA	50898	61123			120.1	50 - 150
26 MeFOSA			1000.00	1092.36	109.2	70 - 130
31 11Cl-PF3OUDS			942.00	840.79	89.3	70 - 130
D 62 d9-EtFOSE	105638	101426			96	50 - 150
33 EtFOSE			1000.00	944.82	94.5	70 - 130
D 59 d5-EtFOSA	45744	49405			108	50 - 150
27 EtFOSA			1000.00	1043.38	104.3	70 - 130
11 PFDoA			1000.00	971.20	97.1	70 - 130
D 38 13C2_PFDoA	722764	751320			104	50 - 150
4 10:2 FTS			964.00	576.27	59.8	70 - 130
34 PFDOS			968.00	904.38	93.4	70 - 130
24 PFTrDA			1000.00	1024.17	102.4	70 - 130
23 PFTeDA			1000.00	913.39	91.3	70 - 130
D 42 13C2_PFTeDA	1022490	1127630			110.3	50 - 150
D 40 13C2_PFHxDA	983864	994460			101.1	50 - 150
35 PFHxDA			1000.00	1065.32	106.5	70 - 130
36 PFODA			1000.00	1022.25	102.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421051.d
Injection Date: 04-Aug-2021 20:26:55 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 43
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	689587			109.8	50 - 150
8 PFBA			1000.00	939.98	94	70 - 130
D 50 13C5_PFPeA	594861	658620			110.7	50 - 150
21 PFPeA			1000.00	874.82	87.5	70 - 130
7 PFBS			884.00	798.87	90.4	70 - 130
D 44 13C3_PFBS	191316	199806			104.4	50 - 150
D 63 13C2_4:2 FTS_2	113853	117507			103.2	50 - 150
1 4:2 FTS			934.00	874.80	93.7	70 - 130
D 49 13C5_PFHxA	699983	736328			105.2	50 - 150
15 PFHxA			1000.00	952.53	95.3	70 - 130
22 PFPeS			938.00	911.25	97.1	70 - 130
28 GenX			2000.00	2050.66	102.5	70 - 130
D 66 13C3_GenX	1232176	1189675			96.6	50 - 150
D 47 13C4_PFHpA	563315	581559			103.2	50 - 150
13 PFHpA			1000.00	912.43	91.2	70 - 130
D 45 13C3_PFHxS	162707	176159			108.3	50 - 150
14 PFHxS			910.00	846.79	93.1	70 - 130
29 ADONA			942.00	887.96	94.3	70 - 130
D 64 13C2_6:2 FTS_2	94624	90899			96.1	50 - 150
2 6:2 FTS			948.00	1228.71	129.6	70 - 130
20 PFOA			1000.00	950.22	95	70 - 130
D 53 13C8_PFOA	520722	594753			114.2	50 - 150
12 PFHpS			952.00	874.31	91.8	70 - 130
18 PFOS			928.00	832.57	89.7	70 - 130
D 54 13C8_PFOS	155583	168974			108.6	50 - 150
17 PFNA			1000.00	900.95	90.1	70 - 130
D 56 13C9_PFNA	683223	741303			108.5	50 - 150
30 9Cl-PF3ONS			932.00	903.14	96.9	70 - 130
D 55 13C8_PFOSA	335834	319166			95	50 - 150
19 PFOSA			1000.00	893.47	89.3	70 - 130
16 PFNS			960.00	896.98	93.4	70 - 130
D 65 13C2_8:2 FTS_2	109751	111620			101.7	50 - 150
10 PFDA			1000.00	933.37	93.3	70 - 130
3 8:2 FTS			958.00	1000.43	104.4	70 - 130
D 51 13C6_PFDA	632664	726213			114.8	50 - 150
D 58 d3-MeFOSAA	796771	768314			96.4	50 - 150

Report Date: 05-Aug-2021 18:39:48 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421051.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1103.56	110.4	70 - 130
9 PFDS			964.00	934.16	96.9	70 - 130
D 52 13C7_PFUdA	654046	786576			120.3	50 - 150
25 PFUdA			1000.00	933.69	93.4	70 - 130
D 60 d5-EtFOSAA	676164	763594			112.9	50 - 150
5 N-EtFOSAA			1000.00	970.24	97	70 - 130
D 61 d7-MeFOSE	81562	96830			118.7	50 - 150
32 MeFOSE			1000.00	868.67	86.9	70 - 130
D 57 d3-MeFOSA	50898	52322			102.8	50 - 150
26 MeFOSA			1000.00	1112.65	111.3	70 - 130
31 11Cl-PF3OUDS			942.00	827.48	87.8	70 - 130
D 62 d9-EtFOSE	105638	107175			101.5	50 - 150
33 EtFOSE			1000.00	945.67	94.6	70 - 130
D 59 d5-EtFOSA	45744	47363			103.5	50 - 150
27 EtFOSA			1000.00	1120.59	112.1	70 - 130
11 PFDoA			1000.00	950.57	95.1	70 - 130
D 38 13C2_PFDoA	722764	749370			103.7	50 - 150
4 10:2 FTS			964.00	616.29	63.9	70 - 130
34 PFDOS			968.00	863.59	89.2	70 - 130
24 PFTrDA			1000.00	992.17	99.2	70 - 130
23 PFTeDA			1000.00	912.33	91.2	70 - 130
D 42 13C2_PFTeDA	1022490	1112132			108.8	50 - 150
D 40 13C2_PFHxDA	983864	1021329			103.8	50 - 150
35 PFHxDA			1000.00	1055.17	105.5	70 - 130
36 PFODA			1000.00	999.10	99.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421068.d
Injection Date: 04-Aug-2021 23:28:01 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 60
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	665290			106	50 - 150
8 PFBA			1000.00	956.43	95.6	70 - 130
D 50 13C5_PFPeA	594861	652695			109.7	50 - 150
21 PFPeA			1000.00	916.23	91.6	70 - 130
7 PFBS			884.00	796.90	90.1	70 - 130
D 44 13C3_PFBS	191316	211767			110.7	50 - 150
D 63 13C2_4:2 FTS_2	113853	114508			100.6	50 - 150
1 4:2 FTS			934.00	935.78	100.2	70 - 130
D 49 13C5_PFHxA	699983	765686			109.4	50 - 150
15 PFHxA			1000.00	846.37	84.6	70 - 130
22 PFPeS			938.00	859.87	91.7	70 - 130
28 GenX			2000.00	1899.72	95	70 - 130
D 66 13C3_GenX	1232176	1238957			100.6	50 - 150
D 47 13C4_PFHpA	563315	602293			106.9	50 - 150
13 PFHpA			1000.00	879.30	87.9	70 - 130
D 45 13C3_PFHxS	162707	180556			111	50 - 150
14 PFHxS			910.00	806.60	88.6	70 - 130
29 ADONA			942.00	805.12	85.5	70 - 130
D 64 13C2_6:2 FTS_2	94624	104842			110.8	50 - 150
2 6:2 FTS			948.00	1071.89	113.1	70 - 130
20 PFOA			1000.00	911.47	91.1	70 - 130
D 53 13C8_PFOA	520722	601698			115.6	50 - 150
12 PFHpS			952.00	821.82	86.3	70 - 130
18 PFOS			928.00	871.04	93.9	70 - 130
D 54 13C8_PFOS	155583	177353			114	50 - 150
17 PFNA			1000.00	886.75	88.7	70 - 130
D 56 13C9_PFNA	683223	760633			111.3	50 - 150
30 9Cl-PF3ONS			932.00	805.85	86.5	70 - 130
D 55 13C8_PFOSA	335834	314960			93.8	50 - 150
19 PFOSA			1000.00	959.73	96	70 - 130
16 PFNS			960.00	780.64	81.3	70 - 130
D 65 13C2_8:2 FTS_2	109751	109716			100	50 - 150
10 PFDA			1000.00	877.57	87.8	70 - 130
3 8:2 FTS			958.00	965.44	100.8	70 - 130
D 51 13C6_PFDA	632664	723352			114.3	50 - 150
D 58 d3-MeFOSAA	796771	833146			104.6	50 - 150

Report Date: 05-Aug-2021 18:39:59 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421068.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	941.22	94.1	70 - 130
9 PFDS			964.00	854.93	88.7	70 - 130
D 52 13C7_PFUdA	654046	739956			113.1	50 - 150
25 PFUdA			1000.00	990.45	99	70 - 130
D 60 d5-EtFOSAA	676164	754231			111.5	50 - 150
5 N-EtFOSAA			1000.00	912.86	91.3	70 - 130
D 61 d7-MeFOSE	81562	96207			118	50 - 150
32 MeFOSE			1000.00	1001.71	100.2	70 - 130
D 57 d3-MeFOSA	50898	53267			104.7	50 - 150
26 MeFOSA			1000.00	1264.44	126.4	70 - 130
31 11Cl-PF3OUDS			942.00	802.24	85.2	70 - 130
D 62 d9-EtFOSE	105638	103304			97.8	50 - 150
33 EtFOSE			1000.00	986.21	98.6	70 - 130
D 59 d5-EtFOSA	45744	49849			109	50 - 150
27 EtFOSA			1000.00	1019.93	102	70 - 130
11 PFDoA			1000.00	892.33	89.2	70 - 130
D 38 13C2_PFDoA	722764	789098			109.2	50 - 150
4 10:2 FTS			964.00	697.02	72.3	70 - 130
34 PFDOS			968.00	874.93	90.4	70 - 130
24 PFTrDA			1000.00	992.39	99.2	70 - 130
23 PFTeDA			1000.00	904.05	90.4	70 - 130
D 42 13C2_PFTeDA	1022490	1157535			113.2	50 - 150
D 40 13C2_PFHxDA	983864	1062635			108	50 - 150
35 PFHxDA			1000.00	1035.70	103.6	70 - 130
36 PFODA			1000.00	970.52	97.1	70 - 130

Report Date: 02-Aug-2021 13:38:46 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
43	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58	072921055.d	ICal					Analytes	L-1	1.00		
44	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35	072921056.d	ICal					Analytes	L-2	1.00		
45	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09	072921057.d	ICal					Analytes	L-3	1.00		
46	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47	072921058.d	ICal					Analytes	L-4	1.00		
47	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21	072921059.d	ICal					Analytes	L-5	1.00		
48	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58	072921060.d	ICal					Analytes	L-6	1.00		
49	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34	072921061.d	ICal					Analytes	L-7	1.00		
50	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11	072921062.d	ICal					Analytes	L-8	1.00		
51	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49	072921063.d	ICal					Analytes	L-9	1.00		
52	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24	072921064.d	ICal					Analytes	L-10	1.00		
100	ID BLK C1	29-Jul-2021 23:33:59	072921065.d	InstBlk					Surrogates	Smp	0.1100		
53	ICV 500_SVLC-1577	29-Jul-2021 23:44:40	072921066.d	ICV					Analytes	ICV	1.00		
54	ISOMERS_SVLC-1562	29-Jul-2021 23:55:16	072921067.d	CheckStd					IsomerCheck	Smp	1.00		
55	ID IBLK A	30-Jul-2021 00:05:50	072921068.d	InstBlk					Surrogates	Smp	0.1100		
56	WG20004-013	30-Jul-2021 00:16:26	072921069.d	Client	AOPC5-14039A-071421	Aqueous	500	10113	Surrogates	Smp	0.1100		RR-100X
57	WG20004-014	30-Jul-2021 00:27:03	072921070.d	Client	AOPC3-W7-9-071421	Aqueous	1	10113	Surrogates	Smp	0.1100		
58	WG20004-015	30-Jul-2021 00:37:40	072921071.d	Client	AOPC5-WNB-14-071421	Aqueous	1	10113	Surrogates	Smp	0.1100		
59	WG20004-016	30-Jul-2021 00:48:16	072921072.d	Client	FB-06-071421	Aqueous	1	10113	Surrogates	Smp	0.1100		
70	ID CCV 1000_SVLC-1573	30-Jul-2021 02:45:10	072921083.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC
Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072921055.d	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58
2	072921056.d	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35
3	072921057.d	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09
4	072921058.d	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47
5	072921059.d	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21
6	072921060.d	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58
7	072921061.d	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34
8	072921062.d	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11
9	072921063.d	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49
10	072921064.d	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.360	3.620	3.731	3.635	3.786	3.519	3.680	3.690	3.807	3.698	3.652	3.399-4.172	0.12877	1.893
1 4:2 FTS	Disabled	1.454	1.076	1.274	1.420	1.628	1.702	1.635	1.624	1.647	1.495	0.710-2.129	0.23656	0.710
15 PFHxA	19.855	17.942	19.352	15.794	17.500	18.355	17.183	16.314	15.519	16.855	17.466	13.282-21.717	1.40585	8.750
22 PFPeS	4.166	3.656	2.941	3.279	3.441	3.653	3.161	3.396	3.288	3.021	3.400	2.366-4.515	0.35821	1.720
28 GenX	0.726	0.715	0.620	0.655	0.649	0.667	0.707	0.639	0.685	0.667	0.673	0.545-0.752	0.03462	0.324
13 PFHpA	3.545	4.076	3.520	3.745	3.422	3.781	3.636	3.460	3.529	3.303	3.601	2.770-4.073	0.21729	1.711
14 PFHxS	4.089	3.420	3.197	3.395	3.682	3.123	3.306	3.403	3.335	3.385	3.433	2.704-4.659	0.32585	1.841
29 ADONA	2.411	3.197	2.230	2.722	2.487	2.383	2.534	2.499	2.348	2.293	2.510	1.690-3.283	0.26565	1.243
2 6:2 FTS	1.544	1.415	1.318	1.333	1.439	1.651	1.445	1.517	1.488	1.566	1.471	1.135-1.742	0.10107	0.719
20 PFOA	2.369	3.069	2.625	2.637	2.935	2.749	2.783	2.612	2.949	2.630	2.735	2.349-3.520	0.19528	1.467
12 PFHpS	3.303	4.277	3.960	4.230	3.560	3.424	3.677	3.423	3.482	3.522	3.685	2.364-4.755	0.39860	1.780
17 PFNA	5.155	4.532	5.197	5.775	5.035	5.037	4.970	4.790	4.869	4.773	5.013	4.083-5.986	0.31730	2.517
18 PFOS	2.360	3.487	3.794	4.285	4.052	3.602	3.979	3.934	4.283	4.039	3.781	2.380-5.723	0.55712	2.026
19 PFOSA	36.660	54.477	49.337	43.319	38.144	43.480	41.837	40.644	40.015	42.118	43.003	22.229-54.058	5.30487	19.072
3 8:2 FTS	0.901	1.419	1.657	1.636	1.465	1.282	1.558	1.777	1.450	1.482	1.462	0.775-2.154	0.22994	0.732
16 PFNS	2.901	3.727	3.253	2.972	3.229	3.465	3.124	3.322	3.239	3.271	3.250	2.546-3.911	0.22750	1.614
10 PFDA	11.856	9.501	8.798	8.965	10.958	10.464	10.182	10.664	11.427	10.442	10.325	8.040-13.875	0.97236	5.479
6 N-MeFOSAA	1.326	1.483	1.586	1.393	1.475	1.482	1.497	1.514	1.528	1.450	1.473	1.213-1.736	0.08701	0.737
9 PFDS	2.262	2.401	2.838	2.945	3.357	3.111	3.073	3.099	3.086	3.299	2.947	2.267-4.446	0.36301	1.678
25 PFUdA	9.284	8.332	10.175	10.601	10.112	11.001	10.912	10.650	10.009	9.800	10.087	7.661-12.562	0.81671	5.056
5 N-EtFOSAA	1.412	1.259	1.572	1.782	1.781	1.703	1.604	1.648	1.740	1.760	1.626	1.085-2.476	0.23180	0.890
26 MeFOSA	Disabled	Disabled	1.164	1.186	1.152	1.123	1.127	1.151	1.112	1.065	1.135	1.040-1.263	0.03725	0.576
27 EtFOSA	1.048	0.983	0.997	1.041	1.048	1.102	1.099	1.047	1.027	1.034	1.042	0.934-1.161	0.03770	0.524
11 PFDoA	6.961	6.661	7.335	7.540	7.924	7.336	7.793	7.769	8.016	7.412	7.474	6.512-9.335	0.47060	3.962
4 10:2 FTS	1.816	1.482	2.612	2.290	2.371	2.405	2.542	2.411	2.366	2.444	2.273	1.331-3.410	0.34662	1.185
34 PFDOS	3.772	3.251	3.371	3.329	3.546	3.234	3.309	3.377	3.393	3.400	3.398	3.066-4.025	0.15990	1.773
24 PFTrDA	3.156	3.039	3.044	3.265	3.146	3.359	3.381	3.321	3.560	3.574	3.284	2.592-3.699	0.18448	1.573
23 PFTeDA	7.534	9.237	9.684	9.563	9.231	9.040	9.368	9.421	9.304	9.135	9.151	7.501-10.960	0.57655	4.615
35 PFHxDA	13.360	12.048	12.444	13.555	12.860	12.627	12.344	12.816	12.248	12.362	12.666	11.341-14.378	0.50621	6.430
36 PFODA	100.909	97.395	92.292	96.826	96.792	99.536	97.529	102.185	103.562	116.551	100.357	76.367-117.21(	6.80801	48.396

Report Date: 02-Aug-2021 13:38:46 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072921055.d	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58
2	072921056.d	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35
3	072921057.d	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09
4	072921058.d	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47
5	072921059.d	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21
6	072921060.d	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58
7	072921061.d	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34
8	072921062.d	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11
9	072921063.d	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49
10	072921064.d	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	919	912	945	905	991	861	794	789	781	834	Avg:A Wt:C2	873		RSD=8.3	
	105.2	104.5	108.2	103.7	113.5	98.6	90.9	90.4	89.5	95.5	Org:N Dep:R				
8 PFBA	1.117562	1.109917	1.027804	1.038681	0.940594	1.034473	1.042349	1.046906	0.997873	0.985758	Avg:A Wt:C2	1.034192		RSD=5.1	
	108.1	107.3	99.4	100.4	90.9	100	100.8	101.2	96.5	95.3	Org:N Dep:R				
D 50 13C5_PFPeA	905	949	957	923	982	916	830	833	769	898	Avg:A Wt:C2	896		RSD=7.4	
	101	105.9	106.8	103	109.6	102.2	92.6	92.9	85.8	100.2	Org:N Dep:R				
21 PFPeA	1.136462	0.996266	0.978572	0.992582	0.948943	0.990005	0.995857	0.976353	0.996882	0.925980	Avg:A Wt:C2	0.993790		RSD=5.6	
	114.4	100.2	98.5	99.9	95.5	99.6	100.2	98.2	100.3	93.2	Org:N Dep:R				
D 44 13C3_PFBS	267	303	301	282	321	274	274	261	244	268	Avg:A Wt:C2	280		RSD=8.1	
	95.5	108.4	107.7	100.9	114.8	98	97.9	93.5	87.5	95.9	Org:N Dep:R				
7 PFBS	1.568105	1.360222	1.338250	1.381944	1.225172	1.390022	1.269246	1.310064	1.420064	1.446640	Avg:A Wt:C2	1.370973		RSD=7.0	
	114.4	99.2	97.6	100.8	89.4	101.4	92.6	95.6	103.6	105.5	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	Disabled	1.489956	1.829572	1.573699	1.646870	1.419128	1.663149	1.779878	1.635544	1.878182	Avg:A Wt:C2	1.657331		RSD=9.2	
	Disabled	89.9	110.4	95	99.4	85.6	100.4	107.4	98.7	113.3	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	35.1322	37.7546	36.1536	38.0410	36.3918	46.4780	36.0392	34.9840	32.5998	36.1184	Avg:A Wt:C2	36.9693		RSD=9.9	
	95	102.1	97.8	102.9	98.4	125.7	97.5	94.6	88.2	97.7	Org:N Dep:R				
D 49 13C5_PFHxA	850	865	832	804	893	769	692	719	733	782	Avg:A Wt:C2	794		RSD=8.4	
	107	108.9	104.8	101.3	112.5	96.9	87.2	90.6	92.3	98.5	Org:N Dep:R				
15 PFHxA	1.089820	0.940282	0.993069	0.938144	0.809539	1.001720	1.058684	0.939397	0.852004	0.944254	Avg:A Wt:C2	0.956691		RSD=8.9	
	113.9	98.3	103.8	98.1	84.6	104.7	110.7	98.2	89.1	98.7	Org:N Dep:R				
22 PFPeS	1.005193	0.943533	0.947579	1.066049	0.904779	1.078676	0.905778	0.984750	1.022638	0.965140	Avg:A Wt:C2	0.982412		RSD=6.2	
	102.3	96	96.5	108.5	92.1	109.8	92.2	100.2	104.1	98.2	Org:N Dep:R				
28 GenX	0.747021	0.704963	0.722298	0.698219	0.629841	0.650503	0.668384	0.626247	0.655331	0.686243	Avg:A Wt:C2	0.678905		RSD=5.9	
	110	103.8	106.4	102.8	92.8	95.8	98.5	92.2	96.5	101.1	Org:N Dep:R				
D 66 13C3_GenX	183	189	186	190	190	189	166	167	166	174	Avg:A Wt:C2	180		RSD=5.9	
	101.8	104.7	103.2	105.6	105.7	104.9	92.3	92.5	92.3	96.9	Org:N Dep:R				
13 PFHpA	1.038466	1.061863	1.033004	1.057036	0.881217	1.050935	1.028632	0.960617	1.016943	0.959947	Avg:A Wt:C2	1.008866		RSD=5.7	
	102.9	105.3	102.4	104.8	87.3	104.2	102	95.2	100.8	95.2	Org:N Dep:R				
D 47 13C4_PFHpA	866	909	845	822	922	787	711	758	698	804	Avg:A Wt:C2	812		RSD=9.4	
	106.6	111.9	104	101.2	113.6	96.9	87.6	93.3	85.9	99	Org:N Dep:R				
D 45 13C3_PFHxS	251	267	284	257	286	237	241	247	237	225	Avg:A Wt:C2	253		RSD=8.1	
	99	105.5	112.2	101.5	112.9	93.6	95.2	97.6	93.8	88.7	Org:N Dep:R				
14 PFHxS	1.250874	1.171602	1.048440	1.072622	0.959883	1.025374	1.030131	1.021963	0.998829	1.135919	Avg:A Wt:C2	1.071564		RSD=8.3	
	116.7	109.3	97.8	100.1	89.6	95.7	96.1	95.4	93.2	106	Org:N Dep:R				
29 ADONA	5.320355	5.825783	4.602910	5.354837	4.439746	4.911948	4.926321	4.437079	4.499002	5.320382	Avg:A Wt:C2	4.963836		RSD=9.6	
	107.2	117.4	92.7	107.9	89.4	99	99.2	89.4	90.6	107.2	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	36.9756	37.0388	38.3076	36.0816	34.6168	33.5626	32.3694	28.8664	29.2982	33.2728	Avg:A Wt:C2	34.0390		RSD=9.5	
	108.6	108.8	112.5	106	101.7	98.6	95.1	84.8	86.1	97.7	Org:N Dep:R				
2 6:2 FTS	5.104860	3.267186	2.303555	1.949402	2.078391	1.955647	1.725623	1.875006	1.809386	1.855609	Ln:A Wt:C2	1.767087	152	R^2=0.992	
	107	94	84.9	92.1	108.5	106.1	95.8	105.2	101.8	104.6	Org:N Dep:R			RSE=8.3	
D 53 13C8_PFOA	808	877	893	848	898	791	764	727	691	763	Avg:A Wt:C2	806		RSD=8.9	
	100.2	108.8	110.8	105.2	111.5	98.1	94.8	90.2	85.7	94.7	Org:N Dep:R				
20 PFOA	1.041830	1.101033	0.954587	0.947817	0.969180	1.028241	0.962466	0.966450	1.008652	0.978530	Avg:A Wt:C2	0.995879		RSD=4.9	
	104.6	110.6	95.9	95.2	97.3	103.2	96.6	97	101.3	98.3	Org:N Dep:R				
12 PFHpS	1.114607	1.060882	0.954519	1.032633	0.895082	1.024806	0.957003	0.889681	0.855619	1.020618	Avg:A Wt:C2	0.980545		RSD=8.5	
	113.7	108.2	97.3	105.3	91.3	104.5	97.6	90.7	87.3	104.1	Org:N Dep:R				
D 54 13C8_PFOS	220	223	230	229	231	208	203	189	187	209	Avg:A Wt:C2	213		RSD=7.7	
	103.3	104.8	108.1	107.5	108.4	97.8	95.3	88.7	87.8	98.2	Org:N Dep:R				
D 56 13C9_PFNA	882	941	886	865	946	934	788	746	746	844	Avg:A Wt:C2	858		RSD=8.8	
	102.8	109.6	103.2	100.8	110.3	108.9	91.9	87	87	98.4	Org:N Dep:R				
17 PFNA	0.862193	0.819631	0.949724	0.927812	0.758872	0.819948	0.876428	0.865211	0.817105	0.791488	Avg:A Wt:C2	0.848841		RSD=7.0	
	101.6	96.6	111.9	109.3	89.4	96.6	103.2	101.9	96.3	93.2	Org:N Dep:R				
18 PFOS	1.155811	1.073943	1.203154	1.151100	1.053701	1.056125	1.034313	1.102042	1.157890	1.074581	Avg:A Wt:C2	1.106266		RSD=5.1	
	104.5	97.1	108.8	104.1	95.2	95.5	93.5	99.6	104.7	97.1	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	2.732331	2.780855	2.753971	2.816714	2.696954	2.921204	2.640293	3.029237	2.839976	2.958412	Avg:A Wt:C2	2.816995		RSD=4.3	
	97	98.7	97.8	100	95.7	103.7	93.7	107.5	100.8	105	Org:N Dep:R				
D 55 13C8_PFOSA	451	446	539	401	436	424	395	395	388	427	Avg:A Wt:C2	430		RSD=10.3	
	104.8	103.6	125.3	93.3	101.4	98.5	91.7	91.9	90.2	99.3	Org:N Dep:R				
19 PFOSA	0.876596	0.988277	0.959957	1.050934	0.963534	1.044521	1.059039	1.008011	0.969778	1.009748	Avg:A Wt:C2	0.993039		RSD=5.5	
	88.3	99.5	96.7	105.8	97	105.2	106.6	101.5	97.7	101.7	Org:N Dep:R				
3 8:2 FTS	1.271903	1.577419	1.648727	1.681604	1.880832	1.587450	1.785352	1.846861	1.546218	1.591832	Avg:A Wt:C2	1.641820		RSD=10.7	
	77.5	96.1	100.4	102.4	114.6	96.7	108.7	112.5	94.2	97	Org:N Dep:R				
16 PFNS	0.909622	0.799248	0.886303	0.832116	0.836293	0.933963	0.817460	0.895024	0.853525	0.830234	Avg:A Wt:C2	0.859379		RSD=5.1	
	105.8	93	103.1	96.8	97.3	108.7	95.1	104.1	99.3	96.6	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	32.7128	31.7172	32.2068	30.9092	28.6502	28.8872	25.6642	26.1154	24.7406	26.2738	Avg:A Wt:C2	28.7877		RSD=10.3	
	113.6	110.2	111.9	107.4	99.5	100.3	89.1	90.7	85.9	91.3	Org:N Dep:R				
10 PFDA	0.859343	0.910199	0.938797	0.971735	0.836846	0.885091	0.869047	0.932339	0.953789	0.911567	Avg:A Wt:C2	0.906875		RSD=4.8	
	94.8	100.4	103.5	107.2	92.3	97.6	95.8	102.8	105.2	100.5	Org:N Dep:R				
D 51 13C6_PFDA	776	848	793	742	842	763	668	663	611	681	Avg:A Wt:C2	739		RSD=10.9	
	105.1	114.8	107.3	100.4	114	103.3	90.4	89.8	82.7	92.1	Org:N Dep:R				
D 58 d3-MeFOSAA	204	199	199	208	189	210	177	189	168	195	Avg:A Wt:C2	194		RSD=7.0	
	105.4	102.5	102.4	107.5	97.7	108.5	91.4	97.6	86.5	100.5	Org:N Dep:R				
6 N-MeFOSAA	0.621086	0.746568	0.832640	0.688084	0.755242	0.700697	0.741140	0.735543	0.830740	0.741960	Avg:A Wt:C2	0.739370		RSD=8.5	
	84	101	112.6	93.1	102.1	94.8	100.2	99.5	112.4	100.4	Org:N Dep:R				
9 PFDS	0.960447	0.996215	0.922270	0.755345	0.944558	1.012106	0.876702	0.891850	0.978086	0.947428	Avg:A Wt:C2	0.928501		RSD=8.0	
	103.4	107.3	99.3	81.4	101.7	109	94.4	96.1	105.3	102	Org:N Dep:R				
D 60 d5-EtFOSAA	192	201	198	183	181	169	172	155	145	159	Avg:A Wt:C2	176		RSD=10.7	
	109.1	114.6	113	104.1	103.1	96.3	98	88.5	82.5	90.7	Org:N Dep:R				
D 52 13C7_PFUdA	733	803	755	677	795	701	644	640	628	640	Avg:A Wt:C2	701		RSD=9.5	
	104.5	114.5	107.6	96.5	113.3	99.9	91.8	91.2	89.6	91.2	Org:N Dep:R				
25 PFUdA	0.851338	0.835265	0.868894	0.908367	0.824869	0.874811	0.895288	0.855057	0.806516	0.874185	Avg:A Wt:C2	0.859459		RSD=3.7	
	99.1	97.2	101.1	105.7	96	101.8	104.2	99.5	93.8	101.7	Org:N Dep:R				
5 N-EtFOSAA	0.894618	0.829951	0.841637	0.880402	0.935820	0.945955	0.873940	0.912997	0.964698	0.966311	Avg:A Wt:C2	0.904633		RSD=5.4	
	98.9	91.7	93	97.3	103.4	104.6	96.6	100.9	106.6	106.8	Org:N Dep:R				
D 61 d7-MeFOSE	188	230	197	182	195	193	165	168	162	200	Avg:A Wt:C2	188		RSD=10.9	
	100	122.7	104.6	96.8	103.6	102.9	87.7	89.2	86.2	106.3	Org:N Dep:R				
32 MeFOSE	0.922138	0.657977	0.998036	0.875348	0.856117	0.856931	0.923830	0.952265	0.953300	0.890117	Avg:A Wt:C2	0.888606		RSD=10.5	
	103.8	74	112.3	98.5	96.3	96.4	104	107.2	107.3	100.2	Org:N Dep:R				
26 MeFOSA	Disabled	Disabled	1.001035	1.115208	1.153087	1.061367	0.933944	1.007735	0.945965	0.900966	Avg:A Wt:C2	1.014914		RSD=8.8	
	Disabled	Disabled	98.6	109.9	113.6	104.6	92	99.3	93.2	88.8	Org:N Dep:R				
D 57 d3-MeFOSA	58.8040	65.8760	61.8310	61.6710	57.9930	63.2180	66.8430	62.5820	64.3520	71.4960	Avg:A Wt:C2	63.4666		RSD=6.2	
	92.7	103.8	97.4	97.2	91.4	99.6	105.3	98.6	101.4	112.7	Org:N Dep:R				
31 11Cl-PF3OUDS	2.843254	2.693439	2.696030	2.325650	2.221579	2.556787	2.327689	2.615658	2.525305	2.588903	Avg:A Wt:C2	2.539429		RSD=7.7	
	112	106.1	106.2	91.6	87.5	100.7	91.7	103	99.4	101.9	Org:N Dep:R				
D 62 d9-EtFOSE	186	173	182	177	171	193	161	164	166	187	Avg:A Wt:C2	176		RSD=6.1	
	105.9	98.3	103.6	100.3	97.3	109.4	91.4	93.2	94.5	106.1	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	0.867331	0.796699	0.838565	0.801961	0.811756	0.725371	0.806238	0.810473	0.768337	0.791518	Avg:A Wt:C2	0.801825		RSD=4.7	
	108.2	99.4	104.6	100	101.2	90.5	100.6	101.1	95.8	98.7	Org:N Dep:R				
D 59 d5-EtFOSA	63.5060	61.9050	60.6080	63.6460	53.2940	67.8640	59.6640	59.6030	55.3700	58.8160	Avg:A Wt:C2	60.4276		RSD=6.9	
	105.1	102.4	100.3	105.3	88.2	112.3	98.7	98.6	91.6	97.3	Org:N Dep:R				
27 EtFOSA	1.086197	1.068734	1.244390	1.072840	1.186775	0.960495	1.022352	0.975543	1.015711	1.063277	Avg:A Wt:C2	1.069631		RSD=8.3	
	101.5	99.9	116.3	100.3	111	89.8	95.6	91.2	95	99.4	Org:N Dep:R				
D 38 13C2_PFDoA	770	728	777	744	852	777	696	720	630	757	Avg:A Wt:C2	745		RSD=7.9	
	103.3	97.7	104.3	99.9	114.4	104.3	93.4	96.6	84.5	101.6	Org:N Dep:R				
11 PFDoA	0.971011	0.940692	0.972162	0.960895	0.870943	0.912175	0.888473	0.903382	0.924406	0.855039	Avg:A Wt:C2	0.919918		RSD=4.5	
	105.6	102.3	105.7	104.5	94.7	99.2	96.6	98.2	100.5	92.9	Org:N Dep:R				
4 10:2 FTS	2.050411	1.461961	2.080854	1.855857	2.015801	2.095664	2.110873	2.011933	1.997789	2.198098	Avg:A Wt:C2	1.987924		RSD=10.3	
	103.1	73.5	104.7	93.4	101.4	105.4	106.2	101.2	100.5	110.6	Org:N Dep:R				
34 PFDOS	1.046257	0.840101	0.941282	0.825429	0.860047	0.911089	0.844335	0.915003	0.888608	0.898809	Avg:A Wt:C2	0.897096		RSD=7.2	
	116.6	93.6	104.9	92	95.9	101.6	94.1	102	99.1	100.2	Org:N Dep:R				
24 PFTrDA	0.405526	0.422982	0.417964	0.412817	0.354926	0.394006	0.403250	0.379297	0.442407	0.419323	Avg:A Wt:C2	0.405250		RSD=6.1	
	100.1	104.4	103.1	101.9	87.6	97.2	99.5	93.6	109.2	103.5	Org:N Dep:R				
D 42 13C2_PFTeDA	774	807	798	789	863	737	716	717	702	761	Avg:A Wt:C2	766		RSD=6.5	
	100.9	105.3	104.1	102.9	112.6	96.1	93.4	93.6	91.6	99.4	Org:N Dep:R				
23 PFTeDA	0.831424	0.832838	0.839564	0.843284	0.749073	0.825176	0.795402	0.792779	0.775340	0.796596	Avg:A Wt:C2	0.808148		RSD=3.9	
	102.9	103.1	103.9	104.3	92.7	102.1	98.4	98.1	95.9	98.6	Org:N Dep:R				
35 PFHxDA	1.725518	1.536590	1.508953	1.442554	1.461620	1.423085	1.364325	1.373765	1.357098	1.361539	Avg:A Wt:C2	1.455505		RSD=7.8	
	118.6	105.6	103.7	99.1	100.4	97.8	93.7	94.4	93.2	93.5	Org:N Dep:R				
D 40 13C2_PFHxDA	510	520	523	515	495	482	463	450	435	489	Avg:A Wt:C2	488		RSD=6.3	
	104.6	106.5	107.1	105.5	101.4	98.7	94.8	92.3	89	100.1	Org:N Dep:R				
36 PFODA	1.261341	1.296078	1.311983	1.287577	1.285609	1.285139	1.259962	1.291628	1.261148	1.450733	Avg:A Wt:C2	1.299120		RSD=4.3	
	97.1	99.8	101	99.1	99	98.9	97	99.4	97.1	111.7	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072921055.d	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58
2	072921056.d	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35
3	072921057.d	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09
4	072921058.d	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47
5	072921059.d	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21
6	072921060.d	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58
7	072921061.d	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34
8	072921062.d	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11
9	072921063.d	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49
10	072921064.d	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	702597	775202	756435	766883	777642	717575	653022	677019	618629	680746	0.78
* 39 13C2_PFHxA	766954	743212	766172	769347	752915	743998	701129	666706	679227	744788	0.73
* 41 13C2_PFOA	845054	864763	923417	859593	921637	814973	796320	753368	704232	797172	1.45
* 43 13C3_PFBA	876865	862066	888074	854177	913072	850788	760833	763819	755943	829144	1.39
* 48 13C4_PFOS	223019	230566	229794	229255	262831	215199	210769	203009	177767	213861	1.04

13C2_PFDA ((|680746 - 702597| / (680746 + 702597)) / 2) * 100 = 0.79
13C2_PFHxA ((|744788 - 766954| / (744788 + 766954)) / 2) * 100 = 0.73
13C2_PFOA ((|797172 - 845054| / (797172 + 845054)) / 2) * 100 = 1.46
13C3_PFBA ((|829144 - 876865| / (829144 + 876865)) / 2) * 100 = 1.40
13C4_PFOS ((|213861 - 223019| / (213861 + 223019)) / 2) * 100 = 1.05

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072921055.d	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58
2	072921056.d	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35
3	072921057.d	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09
4	072921058.d	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47
5	072921059.d	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21
6	072921060.d	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58
7	072921061.d	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34
8	072921062.d	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11
9	072921063.d	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49
10	072921064.d	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	918607	912230	945015	905350	990916	861103	794012	789415	781296	833635	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	51330	101250	194258	470185	932050	1781575	4138188	8264434	11694509	16435250	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	904755	948723	957078	923106	982365	915592	829600	832611	769154	897501	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	51411	94518	187314	458129	932208	1812882	4130816	8129221	11501337	16621356	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	266887	302960	300952	282113	320750	273908	273633	261361	244490	267974	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	18498	36429	71206	172320	347389	673145	1535099	3026813	4603757	6853861	
1 4:2 FTS	Disabled	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	Disabled	5254	12356	27957	55977	123210	279913	581576	746991	1267194	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	175661	188773	180768	190205	181959	232390	180196	174920	162999	180592	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	849755	864996	832017	804241	893485	769489	692494	719193	732511	781771	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	766954	743212	766172	769347	752915	743998	701129	666706	679227	744788	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	46304	81334	165250	377247	723311	1541625	3665662	6756075	9361538	14763806	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	12582	26813	53499	141050	272215	554279	1162420	2414181	3517847	4851944	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	13690	26580	53697	132701	239675	491459	1110565	2086266	3265089	4789121	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	916306	942603	929274	950282	951332	944382	830784	832845	830392	872344	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	44963	96491	174611	434364	812867	1654704	3658833	7282700	10647622	15440713	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	865950	908695	845161	821853	922437	787253	711398	758127	698015	804248	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	250550	267090	284169	257004	285748	237059	241054	247175	237434	224667	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	14260	28476	54224	125429	249599	442395	1129843	2298694	3237178	4644702	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	62785	146576	246428	648197	1195067	2193770	5593169	10331244	15093892	22519720	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	184878	185194	191538	180408	173084	167813	161847	144332	146491	166364	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	8947	11472	16731	33340	68206	124447	264764	513102	753827	1170615	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	845054	864763	923417	859593	921637	814973	796320	753368	704232	797172	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	807656	876559	892595	847588	898114	790701	764265	726541	690896	762870	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	42072	96512	170412	401679	870434	1626063	3677897	7021656	10453108	14929830	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	13293	26975	51645	126326	243491	462557	1098081	2093514	2901026	4365855	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	220009	223335	230393	229007	231032	208346	203133	188931	187064	209237	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	881937	940533	885568	865134	946451	934300	788064	746408	746357	843733	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	38020	77089	168209	401341	718235	1532154	3453405	6458007	9147781	13356092	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	11799	22258	51448	122315	225911	408393	974878	1932188	3015066	4173071	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	223019	230566	229794	229255	262831	215199	210769	203009	177767	213861	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	28013	57883	118270	300592	580713	1134470	2499301	5333993	7426977	11538334	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	450835	445948	539394	401479	436299	424099	394545	395436	388263	427240	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	19760	44072	103559	210964	420389	885961	2089193	3986038	5647934	8628093	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1993	4793	10174	24897	51623	87862	219476	462058	549715	801338	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	9606	17136	39206	91469	185482	373608	797055	1623338	2299159	3335339	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	163564	158586	161034	154546	143251	144436	128321	130577	123703	131369	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	702597	775202	756435	766883	777642	717575	653022	677019	618629	680746	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	33353	77210	148887	360540	704533	1350741	2903296	6183307	8740562	12410105	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	776244	848276	792967	742054	841891	763052	668156	663204	610936	680702	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1022080	993546	992686	1042125	946710	1051243	886046	946284	837988	974242	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	6348	14835	33062	71707	142999	294641	656684	1392065	2088451	2891394	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	10185	21448	40967	83376	210367	406554	858380	1624321	2645669	3822008	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	957504	1006204	991609	913674	904763	845278	860373	776827	724418	795900	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	732893	803230	755029	676929	794661	700826	643672	639520	628219	640015	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	31197	67091	131208	307450	655491	1226180	2881360	5468259	7600027	11189824	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	8566	16702	33383	80440	169339	319838	751914	1418482	2096533	3076348	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	187846	230464	196566	181859	194596	193197	164656	167501	161958	199682	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	8661	15164	39236	79595	166597	331113	760571	1595053	2315918	3554807	
26 MeFOSA	Disabled	Disabled	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	Disabled	Disabled	12379	34388	66871	134195	312138	630661	913121	1288310	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	58804	65876	61831	61671	57993	63218	66843	62582	64352	71496	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	29463	56665	117024	250850	483487	1003600	2227031	4655165	6674923	10205520	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	186434	173177	182377	176632	171262	192711	160926	164045	166388	186889	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	8085	13797	30587	70826	139023	279574	648723	1329541	1917632	2958521	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	63506	61905	60608	63646	53294	67864	59664	59603	55370	58816	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3449	6616	15084	34141	63248	130366	304988	581453	843599	1250754	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	769569	727762	776897	744098	852283	777429	696141	720069	629624	757403	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	37363	68460	151054	357500	742290	1418302	3092514	6504974	8730427	12952175	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3233	4470	12921	27649	55674	116717	261118	506509	714707	1113466	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	11141	18162	41985	91490	192340	367495	830120	1673405	2413611	3640919	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	15604	30783	64943	153588	302497	612624	1403595	2731199	4178249	6351925	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	773516	807288	798117	788911	863033	736570	716022	716949	701873	761478	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	32156	67234	134014	332638	646475	1215600	2847628	5683823	8162854	12131800	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	44036	79905	157736	371656	723869	1371811	3156742	6187876	8847145	13303298	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	510409	520015	522667	515275	495251	481985	462755	450432	434611	488539	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	32190	67398	137146	331728	636699	1238835	2915268	5817904	8221629	14174796	

Pace Environmental Services, LLC
Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072921055.d	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58
2	072921056.d	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35
3	072921057.d	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09
4	072921058.d	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47
5	072921059.d	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21
6	072921060.d	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58
7	072921061.d	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34
8	072921062.d	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11
9	072921063.d	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49
10	072921064.d	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.713	1.713	1.719	1.712	1.712	1.712	1.712	1.712	1.712	1.713	1.713	0.129
8 PFBA	1.719	1.719	1.719	1.719	1.719	1.719	1.712	1.712	1.712	1.719	1.717	0.183
D 50 13C5_PFPeA	2.077	2.077	2.077	2.076	2.076	2.076	2.076	2.076	2.076	2.077	2.076	0.000
21 PFPeA	2.077	2.077	2.087	2.076	2.076	2.076	2.076	2.076	2.076	2.077	2.077	0.167
D 44 13C3_PFBS	2.140	2.129	2.139	2.129	2.129	2.129	2.129	2.129	2.129	2.129	2.130	0.216
7 PFBS	2.129	2.139	2.139	2.129	2.129	2.129	2.129	2.129	2.129	2.129	2.130	0.216
1 4:2 FTS	Disabled	2.406	2.414	2.405	2.414	2.405	2.405	2.414	2.414	2.414	2.410	0.197
D 63 13C2_4:2 FTS_2	2.414	2.414	2.414	2.414	2.414	2.405	2.405	2.405	2.405	2.414	2.410	0.190
D 49 13C5_PFHxA	2.458	2.458	2.458	2.449	2.449	2.449	2.449	2.449	2.449	2.458	2.452	0.190
* 39 13C2_PFHxA	2.458	2.458	2.458	2.457	2.449	2.449	2.449	2.449	2.449	2.449	2.452	0.190
15 PFHxA	2.458	2.449	2.458	2.449	2.449	2.449	2.449	2.449	2.458	2.458	2.452	0.186
22 PFPeS	2.493	2.492	2.492	2.492	2.484	2.484	2.484	2.484	2.484	2.492	2.488	0.191
28 GenX	2.579	2.578	2.578	2.578	2.570	2.570	2.570	2.578	2.570	2.571	2.574	0.160
D 66 13C3_GenX	2.579	2.578	2.571	2.570	2.570	2.570	2.570	2.570	2.570	2.571	2.572	0.131
13 PFHpA	2.845	2.845	2.845	2.835	2.836	2.836	2.836	2.836	2.836	2.836	2.838	0.153
D 47 13C4_PFHpA	2.845	2.836	2.845	2.835	2.836	2.836	2.836	2.836	2.836	2.836	2.837	0.134
D 45 13C3_PFHxS	2.854	2.853	2.854	2.853	2.853	2.844	2.853	2.853	2.853	2.853	2.852	0.099
14 PFHxS	2.862	2.853	2.854	2.853	2.853	2.844	2.853	2.853	2.853	2.853	2.853	0.149
29 ADONA	2.880	2.880	2.880	2.879	2.880	2.871	2.880	2.880	2.880	2.880	2.878	0.101
D 64 13C2_6:2 FTS_2	3.202	3.202	3.202	3.204	3.189	3.196	3.195	3.195	3.195	3.196	3.197	0.150
2 6:2 FTS	3.196	3.202	3.196	3.198	3.196	3.196	3.195	3.195	3.202	3.196	3.197	0.085
* 41 13C2_PFOA	3.221	3.221	3.228	3.223	3.221	3.215	3.221	3.221	3.221	3.221	3.221	0.099
D 53 13C8_PFOA	3.221	3.221	3.221	3.223	3.221	3.221	3.221	3.221	3.221	3.221	3.221	0.029
20 PFOA	3.228	3.228	3.228	3.223	3.221	3.221	3.227	3.227	3.221	3.221	3.224	0.101
12 PFHpS	3.234	3.234	3.228	3.230	3.227	3.227	3.227	3.227	3.227	3.227	3.229	0.084
D 54 13C8_PFOS	3.602	3.594	3.594	3.590	3.587	3.594	3.593	3.586	3.593	3.594	3.592	0.124
D 56 13C9_PFNA	3.602	3.602	3.602	3.597	3.594	3.594	3.593	3.594	3.600	3.594	3.597	0.103
17 PFNA	3.602	3.594	3.602	3.597	3.594	3.601	3.600	3.601	3.600	3.594	3.598	0.091
18 PFOS	3.602	3.602	3.594	3.590	3.594	3.594	3.593	3.594	3.600	3.594	3.595	0.113
* 48 13C4_PFOS	3.594	3.594	3.594	3.590	3.601	3.594	3.593	3.594	3.593	3.594	3.594	0.084
30 9Cl-PF3ONS	3.797	3.796	3.796	3.792	3.796	3.796	3.796	3.796	3.796	3.796	3.796	0.042
D 55 13C8_PFOSA	3.886	3.885	3.885	3.881	3.885	3.885	3.885	3.885	3.885	3.885	3.885	0.041
19 PFOSA	3.886	3.885	3.878	3.881	3.885	3.885	3.885	3.885	3.885	3.885	3.884	0.073

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
3 8:2 FTS	3.931	3.931	3.931	3.926	3.923	3.939	3.931	3.923	3.931	3.931	3.929	0.123
16 PFNS	3.923	3.923	3.923	3.926	3.923	3.923	3.931	3.931	3.923	3.923	3.924	0.081
D 65 13C2_8:2 FTS_2	3.931	3.931	3.931	3.926	3.931	3.931	3.931	3.931	3.931	3.931	3.930	0.045
* 37 13C2_PFDA	3.939	3.939	3.939	3.934	3.939	3.939	3.939	3.939	3.939	3.939	3.938	0.044
10 PFDA	3.947	3.939	3.939	3.934	3.939	3.939	3.931	3.939	3.939	3.939	3.938	0.111
D 51 13C6_PFDA	3.939	3.939	3.939	3.934	3.939	3.939	3.939	3.939	3.939	3.939	3.938	0.044
D 58 d3-MeFOSAA	4.093	4.093	4.093	4.087	4.093	4.093	4.093	4.093	4.093	4.093	4.092	0.054
6 N-MeFOSAA	4.102	4.093	4.102	4.095	4.101	4.101	4.093	4.093	4.093	4.093	4.096	0.100
9 PFDS	4.235	4.226	4.226	4.219	4.226	4.225	4.225	4.225	4.225	4.226	4.225	0.091
D 60 d5-EtFOSAA	4.245	4.245	4.245	4.247	4.245	4.244	4.244	4.244	4.244	4.245	4.244	0.022
D 52 13C7_PFUdA	4.245	4.245	4.245	4.238	4.245	4.244	4.235	4.244	4.244	4.245	4.242	0.086
25 PFUdA	4.254	4.245	4.245	4.247	4.245	4.244	4.244	4.244	4.244	4.245	4.245	0.075
5 N-EtFOSAA	4.254	4.254	4.254	4.257	4.254	4.254	4.254	4.254	4.254	4.254	4.254	0.022
D 61 d7-MeFOSE	4.301	4.292	4.292	4.294	4.301	4.291	4.301	4.300	4.301	4.301	4.297	0.103
32 MeFOSE	4.310	4.310	4.301	4.303	4.310	4.301	4.301	4.310	4.310	4.310	4.306	0.107
26 MeFOSA	Disabled	Disabled	4.319	4.322	4.319	4.319	4.319	4.319	4.319	4.319	4.319	0.016
D 57 d3-MeFOSA	4.320	4.319	4.310	4.312	4.319	4.319	4.319	4.319	4.319	4.319	4.317	0.079
31 11Cl-PF3OUDS	4.383	4.383	4.383	4.385	4.383	4.382	4.382	4.382	4.382	4.382	4.382	0.014
D 62 d9-EtFOSE	4.457	4.457	4.457	4.458	4.457	4.456	4.456	4.456	4.456	4.456	4.456	0.014
33 EtFOSE	4.473	4.473	4.465	4.466	4.473	4.464	4.473	4.473	4.473	4.473	4.470	0.082
D 59 d5-EtFOSA	4.481	4.481	4.473	4.475	4.481	4.481	4.473	4.481	4.481	4.481	4.478	0.085
27 EtFOSA	4.489	4.489	4.489	4.491	4.489	4.481	4.489	4.489	4.489	4.489	4.488	0.064
D 38 13C2_PFDoA	4.514	4.506	4.514	4.507	4.506	4.505	4.514	4.505	4.514	4.514	4.509	0.090
11 PFDoA	4.514	4.514	4.506	4.507	4.514	4.505	4.505	4.513	4.514	4.514	4.510	0.087
4 10:2 FTS	4.522	4.530	4.522	4.515	4.522	4.514	4.522	4.522	4.522	4.522	4.521	0.099
34 PFDOS	4.721	4.720	4.720	4.722	4.720	4.720	4.720	4.720	4.720	4.720	4.720	0.013
24 PFTrDA	4.745	4.745	4.751	4.747	4.751	4.745	4.745	4.745	4.751	4.745	4.746	0.064
D 42 13C2_PFTeDA	4.966	4.966	4.966	4.967	4.966	4.957	4.966	4.965	4.966	4.966	4.964	0.054
23 PFTeDA	4.966	4.966	4.966	4.967	4.966	4.965	4.966	4.965	4.966	4.966	4.965	0.013
35 PFHxDA	5.357	5.357	5.357	5.352	5.348	5.348	5.357	5.348	5.348	5.357	5.352	0.082
D 40 13C2_PFHxDA	5.348	5.348	5.348	5.352	5.348	5.348	5.348	5.348	5.348	5.348	5.348	0.021
36 PFODA	5.723	5.723	5.723	5.726	5.723	5.723	5.723	5.722	5.723	5.723	5.722	0.022

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b\072921066.d
Injection Date: 29-Jul-2021 23:44:40 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 53
Sample Info: ICV 500_SVLC-1577 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Stephen E. Somerville

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	990916	1068339			107.8	50 - 150
8 PFBA			500.00	417.83	83.6	70 - 130
D 50 13C5_PFPeA	982365	1076657			109.6	50 - 150
21 PFPeA			500.00	417.62	83.5	70 - 130
7 PFBS			442.50	383.15	86.6	70 - 130
D 44 13C3_PFBS	320750	313252			97.7	50 - 150
1 4:2 FTS			467.50	429.44	91.9	70 - 130
D 63 13C2_4:2 FTS_2	181959	192442			105.8	50 - 150
D 49 13C5_PFHxA	893485	961683			107.6	50 - 150
15 PFHxA			500.00	415.13	83	70 - 130
22 PFPeS			470.00	425.87	90.6	70 - 130
28 GenX			2500.00	2008.54	80.3	70 - 130
D 66 13C3_GenX	951332	980291			103	50 - 150
D 47 13C4_PFHpA	922437	1003643			108.8	50 - 150
13 PFHpA			500.00	401.18	80.2	70 - 130
D 45 13C3_PFHxS	285748	323636			113.3	50 - 150
14 PFHxS			456.00	346.39	76	70 - 130
29 ADONA			2355.00	1824.53	77.5	70 - 130
D 64 13C2_6:2 FTS_2	173084	178860			103.3	50 - 150
2 6:2 FTS			475.00	438.13	92.2	70 - 130
20 PFOA			500.00	423.40	84.7	70 - 130
D 53 13C8_PFOA	898114	969364			107.9	50 - 150
12 PFHpS			475.00	345.13	72.7	70 - 130
D 54 13C8_PFOS	231032	259386			112.3	50 - 150
18 PFOS			462.75	395.59	85.5	70 - 130
17 PFNA			500.00	392.71	78.5	70 - 130
D 56 13C9_PFNA	946451	1090151			115.2	50 - 150
30 9Cl-PF3ONS			2330.00	1822.40	78.2	70 - 130
D 55 13C8_PFOSA	436299	466366			106.9	50 - 150
19 PFOSA			500.00	498.06	99.6	70 - 130
16 PFNS			480.00	446.86	93.1	70 - 130
3 8:2 FTS			480.00	415.63	86.6	70 - 130
D 65 13C2_8:2 FTS_2	143251	170180			118.8	50 - 150
10 PFDA			500.00	438.58	87.7	70 - 130
D 51 13C6_PFDA	841891	947969			112.6	50 - 150
D 58 d3-MeFOSAA	946710	931934			98.4	50 - 150

Report Date: 02-Aug-2021 13:38:39 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\organics\LL\LCMSMS01.i\072921-DOD ICAL.b\072921066.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	631.26	126.3	70 - 130
9 PFDS			482.50	394.96	81.9	70 - 130
25 PFUdA			500.00	430.91	86.2	70 - 130
D 60 d5-EtFOSAA	904763	1028927			113.7	50 - 150
D 52 13C7_PFUdA	794661	891262			112.2	50 - 150
5 N-EtFOSAA			500.00	589.46	117.9	70 - 130
D 61 d7-MeFOSE	194596	220176			113.1	50 - 150
D 57 d3-MeFOSA	57993	69256			119.4	50 - 150
31 11Cl-PF3OUDS			2355.00	1770.74	75.2	70 - 130
D 62 d9-EtFOSE	171262	205532			120	50 - 150
D 59 d5-EtFOSA	53294	61981			116.3	50 - 150
D 38 13C2_PFDoA	852283	1067440			125.2	50 - 150
11 PFDoA			500.00	368.78	73.8	70 - 130
4 10:2 FTS			2410.00	2480.87	102.9	70 - 130
24 PFTrDA			500.00	380.82	76.2	70 - 130
23 PFTeDA			500.00	437.57	87.5	70 - 130
D 42 13C2_PFTeDA	863033	948361			109.9	50 - 150
D 40 13C2_PFHxDA	495251	579184			116.9	50 - 150

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b\072921083.d
Injection Date: 30-Jul-2021 02:45:10 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 70
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Stephen E. Somerville

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	990916	917873			92.6	50 - 150
8 PFBA			1000.00	887.34	88.7	70 - 130
D 50 13C5_PFPeA	982365	975609			99.3	50 - 150
21 PFPeA			1000.00	885.52	88.6	70 - 130
7 PFBS			884.00	740.03	83.7	70 - 130
D 44 13C3_PFBS	320750	277801			86.6	50 - 150
1 4:2 FTS			934.00	947.49	101.4	70 - 130
D 63 13C2_4:2 FTS_2	181959	170073			93.5	50 - 150
D 49 13C5_PFHxA	893485	743394			83.2	50 - 150
15 PFHxA			1000.00	992.25	99.2	70 - 130
22 PFPeS			938.00	1005.25	107.2	70 - 130
28 GenX			2000.00	1820.91	91	70 - 130
D 66 13C3_GenX	951332	893857			94	50 - 150
D 47 13C4_PFHpA	922437	803203			87.1	50 - 150
13 PFHpA			1000.00	882.94	88.3	70 - 130
D 45 13C3_PFHxS	285748	248647			87	50 - 150
14 PFHxS			910.00	849.93	93.4	70 - 130
29 ADONA			942.00	852.52	90.5	70 - 130
D 64 13C2_6:2 FTS_2	173084	163139			94.3	50 - 150
2 6:2 FTS			948.00	899.96	94.9	70 - 130
20 PFOA			1000.00	966.61	96.7	70 - 130
D 53 13C8_PFOA	898114	790695			88	50 - 150
12 PFHpS			952.00	867.04	91.1	70 - 130
D 54 13C8_PFOS	231032	209474			90.7	50 - 150
18 PFOS			928.00	844.40	91	70 - 130
17 PFNA			1000.00	1044.29	104.4	70 - 130
D 56 13C9_PFNA	946451	833103			88	50 - 150
30 9Cl-PF3ONS			932.00	845.05	90.7	70 - 130
D 55 13C8_PFOSA	436299	390437			89.5	50 - 150
19 PFOSA			1000.00	1101.75	110.2	70 - 130
16 PFNS			960.00	957.40	99.7	70 - 130
3 8:2 FTS			958.00	1135.74	118.6	70 - 130
D 65 13C2_8:2 FTS_2	143251	143250			100	50 - 150
10 PFDA			1000.00	985.08	98.5	70 - 130
D 51 13C6_PFDA	841891	752464			89.4	50 - 150
D 58 d3-MeFOSAA	946710	876570			92.6	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1071.13	107.1	70 - 130
9 PFDS			964.00	962.77	99.9	70 - 130
25 PFUdA			1000.00	1260.30	126	70 - 130
D 60 d5-EtFOSAA	904763	804108			88.9	50 - 150
D 52 13C7_PFUdA	794661	692926			87.2	50 - 150
5 N-EtFOSAA			1000.00	1070.51	107.1	70 - 130
D 61 d7-MeFOSE	194596	159220			81.8	50 - 150
32 MeFOSE			1000.00	1216.60	121.7	70 - 130
26 MeFOSA			1000.00	1178.93	117.9	70 - 130
D 57 d3-MeFOSA	57993	56603			97.6	50 - 150
31 11Cl-PF3OUDS			942.00	859.45	91.2	70 - 130
D 62 d9-EtFOSE	171262	163522			95.5	50 - 150
33 EtFOSE			1000.00	967.85	96.8	70 - 130
D 59 d5-EtFOSA	53294	51642			96.9	50 - 150
27 EtFOSA			1000.00	1094.63	109.5	70 - 130
D 38 13C2_PFDoA	852283	759579			89.1	50 - 150
11 PFDoA			1000.00	921.14	92.1	70 - 130
4 10:2 FTS			964.00	977.14	101.4	70 - 130
34 PFDOS			968.00	875.06	90.4	70 - 130
24 PFTrDA			1000.00	855.76	85.6	70 - 130
23 PFTeDA			1000.00	944.76	94.5	70 - 130
D 42 13C2_PFTeDA	863033	763285			88.4	50 - 150
35 PFHxDA			1000.00	988.84	98.9	70 - 130
D 40 13C2_PFHxDA	495251	452682			91.4	50 - 150
36 PFODA			1000.00	1034.45	103.4	70 - 130

Report Date: 04-Aug-2021 18:09:56 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

PFHxA, PFHxS AND PFOS ONLY

Batch: \\organics\LL\LCMSMS01.i\080321-DOD.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	03-Aug-2021 09:07:44	080321005.d	CCV					Analytes	L-2	1.00		GenX high - NCM/ND
96	ID CCV 200_SVLC-1547	03-Aug-2021 09:18:18	080321006.d	CCV					Analytes	L-3	1.00		RR-2X, MeFOSE low
96	ID CCV 200A_SVLC-1547	03-Aug-2021 10:04:57	080321010.d	CCV					Analytes	L-3	1.00		All pass
96	ID CCV 200A CONF_SVLC-1547	03-Aug-2021 10:15:29	080321011.d	CCV					Analytes	L-3	1.00		Confirms all pass
97	ID IBLK A	03-Aug-2021 10:26:02	080321012.d	InstBlk					Surrogates	Smp	0.1100		
1	WG20004-013	03-Aug-2021 10:36:37	080321013.d	Client	AOPC5-14039A-071421	Aqueous	100	10113	Surrogates	Smp	0.1100		
2	WQ10675-001	03-Aug-2021 10:47:09	080321014.d	MBlk		Aqueous	1	10675	Surrogates	Smp	0.1100		
3	WQ10675-002	03-Aug-2021 10:57:41	080321015.d	LCS		Aqueous	1	10675	Analytes	100x PDS	0.2000		RR-6:2FTS HIGH, MEFOSA SUR LOW
4	WG22011-003	03-Aug-2021 11:08:16	080321016.d	Client	AOPC3-W7-3-071921-FD	Aqueous	1	10675	Surrogates	Smp	0.1100		
5	WG22011-004	03-Aug-2021 11:18:49	080321017.d	Client	AOPC3-W7-11-071921	Aqueous	1	10675	Surrogates	Smp	0.1100		
6	WG22011-005	03-Aug-2021 11:29:24	080321018.d	Client	AOPC03-W7-13-071921	Aqueous	1	10675	Surrogates	Smp	0.1100		
7	WG22011-006	03-Aug-2021 11:39:57	080321019.d	Client	AOPC03-UST-MW-02-071921	Aqueous	1	10675	Surrogates	Smp	0.1100		OK, RX is for PFPeS
8	WG22011-008	03-Aug-2021 11:50:33	080321020.d	Client	AOPC21-W6-6-071921	Aqueous	1	10675	Surrogates	Smp	0.1100		
9	WG30020-001	03-Aug-2021 12:01:10	080321021.d	Client	AFFF01-FRB-01-072921-T2	Aqueous	1	10675	Surrogates	Smp	0.1100		
10	WQ10710-001	03-Aug-2021 12:11:49	080321022.d	MBlk		Aqueous	1	10710	Surrogates	Smp	0.1100		DETECTS CONFIRM, REPORT ORIG
11	WQ10452-001	03-Aug-2021 12:22:28	080321023.d	MBlk		Aqueous	1	10452	Surrogates	Smp	0.1100		RR-MeFOSA sur low
12	WQ10452-002	03-Aug-2021 12:33:01	080321024.d	LCS		Aqueous	1	10452	Analytes	100x PDS	0.2000		GenX high, OK if ND
13	WG22011-014	03-Aug-2021 12:43:33	080321025.d	Client	AOPC21-WU5-10-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
14	WG22011-015	03-Aug-2021 12:54:06	080321026.d	Client	AOPC21-W4-6-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
15	WG22011-016	03-Aug-2021 13:04:39	080321027.d	Client	FB-10-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
16	CCV 1000_SVLC-1573	03-Aug-2021 13:15:12	080321028.d	CCV					Analytes	L-5	1.00		
100	CCB C1	03-Aug-2021 13:25:47	080321029.d	InstBlk					Surrogates	Smp	0.1100		
17	WG22011-017	03-Aug-2021 13:36:28	080321030.d	Client	AOPC10-WGC2-13-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		
18	WG22011-018	03-Aug-2021 13:47:02	080321031.d	Client	AOPC10-WGC2-8-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		
19	WG22011-019	03-Aug-2021 13:57:36	080321032.d	Client	AOPC10-WGC2-10-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		several sur low-NCM/MTX, 4:2 sur high-NCM/ND
20	WG22011-020	03-Aug-2021 14:08:13	080321033.d	Client	AOPC10-WGC2-1-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		
21	WG22011-021	03-Aug-2021 14:18:53	080321034.d	Client	FB-11-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		
22	WG22019-004	03-Aug-2021 14:29:25	080321035.d	Client	RRAD-FFTA-EB-SE-1-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
23	WG22019-008	03-Aug-2021 14:39:59	080321036.d	Client	RRAD-FFTA-EB-S0-1-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
24	WG22019-009	03-Aug-2021 14:50:33	080321037.d	Client	RRAD-FFTA-SB-1-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
25	WG22019-010	03-Aug-2021 15:01:06	080321038.d	Client	RRAD-FFTA-FB-1-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
26	WG22067-001	03-Aug-2021 15:11:43	080321039.d	Client	DPG-IDW-AQ-2-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		several sur low, NCM/MTX. RX-8:2 sur high-detect
27	CCV 1000A_SVLC-1573	03-Aug-2021 15:22:17	080321040.d	CCV					Analytes	L-5	1.00		
100	CCB C2	03-Aug-2021 15:32:53	080321041.d	InstBlk					Surrogates	Smp	0.1100		
28	WG22086-001	03-Aug-2021 15:43:35	080321042.d	Client	DPG-EB-07-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
29	WG22086-002	03-Aug-2021 15:54:11	080321043.d	Client	DPG-EB-08-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
30	WG22086-003	03-Aug-2021 16:04:47	080321044.d	Client	DPG-EB-09-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
31	WG22086-004	03-Aug-2021 16:15:26	080321045.d	Client	DPG-EB-10-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
32	WG22086-011	03-Aug-2021 16:25:59	080321046.d	Client	DPG-WW06-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
33	WG22086-011MS	03-Aug-2021 16:36:32	080321047.d	MS		Aqueous	1	10452	Analytes	100x PDS	0.2000		
34	WG22086-011MD	03-Aug-2021 16:47:07	080321048.d	MSD		Aqueous	1	10452	Analytes	100x PDS	0.2000		
35	WG22086-012	03-Aug-2021 16:57:42	080321049.d	Client	DPG-FB-06-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
36	WG22086-013	03-Aug-2021 17:08:17	080321050.d	Client	DPG-FD-04-GW-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
37	CCV 1000B_SVLC-1573	03-Aug-2021 17:18:53	080321051.d	CCV					Analytes	L-5	1.00		

Report Date: 04-Aug-2021 18:09:56 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\organics\LL\LCMSMS01.i\080321-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
100	CCB C3	03-Aug-2021 17:29:37	080321052.d	InstBlk					Surrogates	Smp	0.1100		
38	WG27059-001	03-Aug-2021 17:40:19	080321053.d	Client	Shaw-source-007	Aqueous	1	10710	Surrogates	Smp	0.1100		rx confirms
39	WG27059-003	03-Aug-2021 17:50:56	080321054.d	Client	Shaw-source-001	Aqueous	1	10710	Surrogates	Smp	0.1100		rx confirms
40	WG31016-017	03-Aug-2021 18:01:33	080321055.d	Client	AFFF21-GW05-16-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		6:2 CCV NCM/ND
41	WG31016-018	03-Aug-2021 18:12:14	080321056.d	Client	AFFF21-GW29-22-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		RR-6:2 CCV
42	WG31016-019	03-Aug-2021 18:22:46	080321057.d	Client	AFFF21-GW29-15-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		RR-6:2 CCV
43	WG31016-020	03-Aug-2021 18:33:21	080321058.d	Client	AFFF21-GW01-23-073021-00	Aqueous	1	10710	Surrogates	Smp	0.1100		SEVERAL SURS LOW-NCM/MTX, RR-6:2 CCV
44	WG31016-021	03-Aug-2021 18:43:57	080321059.d	Client	AFFF21-GW01-15-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		RR-6:2 CCV
45	WQ10798-001	03-Aug-2021 18:54:32	080321060.d	Client		Soil	1	10798	Surrogates	Smp	0.1100		
46	WQ10798-002	03-Aug-2021 19:05:09	080321061.d	LCS		Soil	1	10798	Analytes	100x PDS	0.1000		RR-6:2 LOW
47	CCV 1000C_SVLC-1573	03-Aug-2021 19:15:44	080321062.d	CCV					Analytes	L-5	1.00		6:2 HIGH-NCM/ND
100	CCB C4	03-Aug-2021 19:26:21	080321063.d	InstBlk					Surrogates	Smp	0.1100		
48	WQ10069-002	03-Aug-2021 19:37:03	080321064.d	LCS		Soil	1	10069	Analytes	100x PDS	0.1000		GenX(133%);6:2(55%);
53	CCV 1000D_SVLC-1573	03-Aug-2021 20:30:07	080321069.d	CCV					Analytes	L-5	1.00		6:2 HIGH
100	CCB C5	03-Aug-2021 20:40:42	080321070.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321005.d
Injection Date: 03-Aug-2021 09:07:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	990916	1185130			119.6	50 - 150
8 PFBA			100.00	110.79	110.8	70 - 130
D 50 13C5_PFPeA	982365	1263824			128.7	50 - 150
21 PFPeA			100.00	92.038	92	70 - 130
7 PFBS			88.400	100.95	114.2	70 - 130
D 44 13C3_PFBS	320750	312372			97.4	50 - 150
1 4:2 FTS			93.400	97.010	103.9	70 - 130
D 63 13C2_4:2 FTS_2	181959	369798			203.2	50 - 150
D 49 13C5_PFHxA	893485	1074983			120.3	50 - 150
15 PFHxA			100.00	98.295	98.3	70 - 130
22 PFPeS			93.800	102.50	109.3	70 - 130
28 GenX			200.00	283.68	141.8	70 - 130
D 66 13C3_GenX	951332	701708			73.8	50 - 150
D 47 13C4_PFHpA	922437	1078744			116.9	50 - 150
13 PFHpA			100.00	89.299	89.3	70 - 130
D 45 13C3_PFHxS	285748	306958			107.4	50 - 150
14 PFHxS			91.000	86.646	95.2	70 - 130
29 ADONA			94.200	111.73	118.6	70 - 130
D 64 13C2_6:2 FTS_2	173084	297562			171.9	50 - 150
2 6:2 FTS			94.800	96.686	102	70 - 130
20 PFOA			100.00	118.32	118.3	70 - 130
D 53 13C8_PFOA	898114	1021364			113.7	50 - 150
12 PFHpS			95.200	103.30	108.5	70 - 130
D 54 13C8_PFOS	231032	258986			112.1	50 - 150
18 PFOS			92.800	112.46	121.2	70 - 130
17 PFNA			100.00	107.84	107.8	70 - 130
D 56 13C9_PFNA	946451	1016403			107.4	50 - 150
30 9Cl-PF3ONS			93.200	95.967	103	70 - 130
D 55 13C8_PFOSA	436299	491853			112.7	50 - 150
19 PFOSA			100.00	103.76	103.8	70 - 130
16 PFNS			96.000	110.67	115.3	70 - 130
3 8:2 FTS			95.800	108.56	113.3	70 - 130
D 65 13C2_8:2 FTS_2	143251	286368			199.9	50 - 150
10 PFDA			100.00	92.911	92.9	70 - 130
D 51 13C6_PFDA	841891	988943			117.5	50 - 150
D 58 d3-MeFOSAA	946710	1304722			137.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	116.79	116.8	70 - 130
9 PFDS			96.400	101.78	105.6	70 - 130
25 PFUdA			100.00	106.15	106.2	70 - 130
D 60 d5-EtFOSAA	904763	1171880			129.5	50 - 150
D 52 13C7_PFUdA	794661	820462			103.2	50 - 150
5 N-EtFOSAA			100.00	114.98	115	70 - 130
D 61 d7-MeFOSE	194596	147736			75.9	50 - 150
32 MeFOSE			100.00	109.39	109.4	70 - 130
26 MeFOSA			100.00	125.43	125.4	70 - 130
D 57 d3-MeFOSA	57993	85068			146.7	50 - 150
31 11Cl-PF3OUDS			94.200	94.732	100.6	70 - 130
D 62 d9-EtFOSE	171262	149942			87.6	50 - 150
33 EtFOSE			100.00	106.26	106.3	70 - 130
D 59 d5-EtFOSA	53294	61503			115.4	50 - 150
27 EtFOSA			100.00	163.52	163.5	70 - 130
D 38 13C2_PFDoA	852283	898934			105.5	50 - 150
11 PFDoA			100.00	99.825	99.8	70 - 130
4 10:2 FTS			96.400	102.90	106.7	70 - 130
34 PFDOS			96.800	81.705	84.4	70 - 130
24 PFTrDA			100.00	97.166	97.2	70 - 130
23 PFTeDA			100.00	103.96	104	70 - 130
D 42 13C2_PFTeDA	863033	977593			113.3	50 - 150
35 PFHxDA			100.00	114.79	114.8	70 - 130
D 40 13C2_PFHxDA	495251	482998			97.5	50 - 150
36 PFODA			100.00	80.667	80.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321006.d
Injection Date: 03-Aug-2021 09:18:18 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1222021			103.1	50 - 150
8 PFBA			200.00	202.72	101.4	70 - 130
D 50 13C5_PFPeA	1263824	1179139			93.3	50 - 150
21 PFPeA			200.00	198.59	99.3	70 - 130
7 PFBS			176.80	172.82	97.7	70 - 130
D 44 13C3_PFBS	312372	345490			110.6	50 - 150
1 4:2 FTS			186.80	212.39	113.7	70 - 130
D 63 13C2_4:2 FTS_2	369798	354707			95.9	50 - 150
D 49 13C5_PFHxA	1074983	1058163			98.4	50 - 150
15 PFHxA			200.00	196.63	98.3	70 - 130
22 PFPeS			187.60	196.17	104.6	70 - 130
28 GenX			400.00	521.11	130.3	70 - 130
D 66 13C3_GenX	701708	688193			98.1	50 - 150
D 47 13C4_PFHpA	1078744	1086850			100.8	50 - 150
13 PFHpA			200.00	163.08	81.5	70 - 130
D 45 13C3_PFHxS	306958	296968			96.7	50 - 150
14 PFHxS			182.00	199.37	109.5	70 - 130
29 ADONA			188.40	226.54	120.2	70 - 130
D 64 13C2_6:2 FTS_2	297562	318841			107.2	50 - 150
2 6:2 FTS			189.60	181.80	95.9	70 - 130
20 PFOA			200.00	198.02	99	70 - 130
D 53 13C8_PFOA	1021364	1061790			104	50 - 150
12 PFHpS			190.40	182.35	95.8	70 - 130
D 54 13C8_PFOS	258986	261992			101.2	50 - 150
18 PFOS			185.60	199.97	107.7	70 - 130
17 PFNA			200.00	213.38	106.7	70 - 130
D 56 13C9_PFNA	1016403	969567			95.4	50 - 150
30 9Cl-PF3ONS			186.40	185.42	99.5	70 - 130
D 55 13C8_PFOSA	491853	543165			110.4	50 - 150
19 PFOSA			200.00	210.82	105.4	70 - 130
16 PFNS			192.00	192.57	100.3	70 - 130
3 8:2 FTS			191.60	192.77	100.6	70 - 130
D 65 13C2_8:2 FTS_2	286368	299745			104.7	50 - 150
10 PFDA			200.00	219.97	110	70 - 130
D 51 13C6_PFDA	988943	896895			90.7	50 - 150
D 58 d3-MeFOSAA	1304722	1293733			99.2	50 - 150

Report Date: 04-Aug-2021 18:08:43 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\080321-DOD.b\080321006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	211.63	105.8	70 - 130
9 PFDS			192.80	202.01	104.8	70 - 130
25 PFUdA			200.00	258.18	129.1	70 - 130
D 60 d5-EtFOSAA	1171880	1178972			100.6	50 - 150
D 52 13C7_PFUdA	820462	795468			97	50 - 150
5 N-EtFOSAA			200.00	212.50	106.2	70 - 130
D 61 d7-MeFOSE	147736	206407			139.7	50 - 150
32 MeFOSE			200.00	133.72	66.9	70 - 130
26 MeFOSA			200.00	202.87	101.4	70 - 130
D 57 d3-MeFOSA	85068	75246			88.5	50 - 150
31 11Cl-PF3OUDS			188.40	156.17	82.9	70 - 130
D 62 d9-EtFOSE	149942	148922			99.3	50 - 150
33 EtFOSE			200.00	209.82	104.9	70 - 130
D 59 d5-EtFOSA	61503	61653			100.2	50 - 150
27 EtFOSA			200.00	214.81	107.4	70 - 130
D 38 13C2_PFDoA	898934	838028			93.2	50 - 150
11 PFDoA			200.00	258.82	129.4	70 - 130
4 10:2 FTS			192.80	185.95	96.4	70 - 130
34 PFDOS			193.60	188.80	97.5	70 - 130
24 PFTrDA			200.00	194.00	97	70 - 130
23 PFTeDA			200.00	206.69	103.3	70 - 130
D 42 13C2_PFTeDA	977593	975218			99.8	50 - 150
35 PFHxDA			200.00	214.41	107.2	70 - 130
D 40 13C2_PFHxDA	482998	478223			99	50 - 150
36 PFODA			200.00	162.29	81.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321010.d
Injection Date: 03-Aug-2021 10:04:57 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200A_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1222975			103.2	50 - 150
8 PFBA			200.00	208.44	104.2	70 - 130
D 50 13C5_PFPeA	1263824	1144631			90.6	50 - 150
21 PFPeA			200.00	215.06	107.5	70 - 130
7 PFBS			176.80	164.55	93.1	70 - 130
D 44 13C3_PFBS	312372	373980			119.7	50 - 150
1 4:2 FTS			186.80	217.90	116.7	70 - 130
D 63 13C2_4:2 FTS_2	369798	357094			96.6	50 - 150
D 49 13C5_PFHxA	1074983	1025040			95.4	50 - 150
15 PFHxA			200.00	213.80	106.9	70 - 130
22 PFPeS			187.60	195.53	104.2	70 - 130
28 GenX			400.00	501.03	125.3	70 - 130
D 66 13C3_GenX	701708	768135			109.5	50 - 150
D 47 13C4_PFHpA	1078744	1114276			103.3	50 - 150
13 PFHpA			200.00	172.45	86.2	70 - 130
D 45 13C3_PFHxS	306958	300274			97.8	50 - 150
14 PFHxS			182.00	194.76	107	70 - 130
29 ADONA			188.40	191.68	101.7	70 - 130
D 64 13C2_6:2 FTS_2	297562	303485			102	50 - 150
2 6:2 FTS			189.60	206.31	108.8	70 - 130
20 PFOA			200.00	201.27	100.6	70 - 130
D 53 13C8_PFOA	1021364	1075940			105.3	50 - 150
12 PFHpS			190.40	203.72	107	70 - 130
D 54 13C8_PFOS	258986	270799			104.6	50 - 150
18 PFOS			185.60	194.90	105	70 - 130
17 PFNA			200.00	207.17	103.6	70 - 130
D 56 13C9_PFNA	1016403	1029709			101.3	50 - 150
30 9Cl-PF3ONS			186.40	170.89	91.7	70 - 130
D 55 13C8_PFOSA	491853	487846			99.2	50 - 150
19 PFOSA			200.00	200.26	100.1	70 - 130
16 PFNS			192.00	202.58	105.5	70 - 130
3 8:2 FTS			191.60	236.43	123.4	70 - 130
D 65 13C2_8:2 FTS_2	286368	303915			106.1	50 - 150
10 PFDA			200.00	206.93	103.5	70 - 130
D 51 13C6_PFDA	988943	884093			89.4	50 - 150
D 58 d3-MeFOSAA	1304722	1405859			107.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	180.77	90.4	70 - 130
9 PFDS			192.80	209.95	108.9	70 - 130
25 PFUdA			200.00	206.24	103.1	70 - 130
D 60 d5-EtFOSAA	1171880	1185634			101.2	50 - 150
D 52 13C7_PFUdA	820462	874174			106.5	50 - 150
5 N-EtFOSAA			200.00	219.25	109.6	70 - 130
D 61 d7-MeFOSE	147736	147052			99.5	50 - 150
32 MeFOSE			200.00	250.41	125.2	70 - 130
26 MeFOSA			200.00	210.53	105.3	70 - 130
D 57 d3-MeFOSA	85068	66164			77.8	50 - 150
31 11Cl-PF3OUDS			188.40	158.69	84.2	70 - 130
D 62 d9-EtFOSE	149942	150688			100.5	50 - 150
33 EtFOSE			200.00	232.24	116.1	70 - 130
D 59 d5-EtFOSA	61503	63216			102.8	50 - 150
27 EtFOSA			200.00	187.73	93.9	70 - 130
D 38 13C2_PFDoA	898934	832475			92.6	50 - 150
11 PFDoA			200.00	213.87	106.9	70 - 130
4 10:2 FTS			192.80	197.75	102.6	70 - 130
34 PFDOS			193.60	172.55	89.1	70 - 130
24 PFTrDA			200.00	189.65	94.8	70 - 130
23 PFTeDA			200.00	203.07	101.5	70 - 130
D 42 13C2_PFTeDA	977593	997255			102	50 - 150
35 PFHxDA			200.00	230.48	115.2	70 - 130
D 40 13C2_PFHxDA	482998	446658			92.5	50 - 150
36 PFODA			200.00	171.06	85.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321011.d
Injection Date: 03-Aug-2021 10:15:29 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200A CONF_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1225669			103.4	50 - 150
8 PFBA			200.00	201.58	100.8	70 - 130
D 50 13C5_PFPeA	1263824	1183499			93.6	50 - 150
21 PFPeA			200.00	209.32	104.7	70 - 130
7 PFBS			176.80	181.11	102.4	70 - 130
D 44 13C3_PFBS	312372	340973			109.2	50 - 150
1 4:2 FTS			186.80	194.54	104.1	70 - 130
D 63 13C2_4:2 FTS_2	369798	340984			92.2	50 - 150
D 49 13C5_PFHxA	1074983	915787			85.2	50 - 150
15 PFHxA			200.00	233.48	116.7	70 - 130
22 PFPeS			187.60	202.62	108	70 - 130
28 GenX			400.00	502.59	125.6	70 - 130
D 66 13C3_GenX	701708	702837			100.2	50 - 150
D 47 13C4_PFHpA	1078744	1073240			99.5	50 - 150
13 PFHpA			200.00	191.09	95.5	70 - 130
D 45 13C3_PFHxS	306958	300181			97.8	50 - 150
14 PFHxS			182.00	188.05	103.3	70 - 130
29 ADONA			188.40	189.56	100.6	70 - 130
D 64 13C2_6:2 FTS_2	297562	319567			107.4	50 - 150
2 6:2 FTS			189.60	214.54	113.2	70 - 130
20 PFOA			200.00	200.41	100.2	70 - 130
D 53 13C8_PFOA	1021364	1028200			100.7	50 - 150
12 PFHpS			190.40	193.67	101.7	70 - 130
D 54 13C8_PFOS	258986	271036			104.7	50 - 150
18 PFOS			185.60	196.62	105.9	70 - 130
17 PFNA			200.00	229.08	114.5	70 - 130
D 56 13C9_PFNA	1016403	1040530			102.4	50 - 150
30 9Cl-PF3ONS			186.40	178.56	95.8	70 - 130
D 55 13C8_PFOSA	491853	501043			101.9	50 - 150
19 PFOSA			200.00	212.14	106.1	70 - 130
16 PFNS			192.00	183.54	95.6	70 - 130
3 8:2 FTS			191.60	173.69	90.7	70 - 130
D 65 13C2_8:2 FTS_2	286368	302154			105.5	50 - 150
10 PFDA			200.00	197.32	98.7	70 - 130
D 51 13C6_PFDA	988943	975094			98.6	50 - 150
D 58 d3-MeFOSAA	1304722	1303279			99.9	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	237.92	119	70 - 130
9 PFDS			192.80	202.73	105.1	70 - 130
25 PFUdA			200.00	210.03	105	70 - 130
D 60 d5-EtFOSAA	1171880	1268290			108.2	50 - 150
D 52 13C7_PFUdA	820462	907565			110.6	50 - 150
5 N-EtFOSAA			200.00	176.50	88.2	70 - 130
D 61 d7-MeFOSE	147736	148779			100.7	50 - 150
32 MeFOSE			200.00	242.14	121.1	70 - 130
26 MeFOSA			200.00	231.59	115.8	70 - 130
D 57 d3-MeFOSA	85068	70554			82.9	50 - 150
31 11Cl-PF3OUDS			188.40	161.19	85.6	70 - 130
D 62 d9-EtFOSE	149942	140531			93.7	50 - 150
33 EtFOSE			200.00	217.82	108.9	70 - 130
D 59 d5-EtFOSA	61503	67484			109.7	50 - 150
27 EtFOSA			200.00	185.60	92.8	70 - 130
D 38 13C2_PFDoA	898934	818788			91.1	50 - 150
11 PFDoA			200.00	227.41	113.7	70 - 130
4 10:2 FTS			192.80	165.38	85.8	70 - 130
34 PFDOS			193.60	191.14	98.7	70 - 130
24 PFTrDA			200.00	192.77	96.4	70 - 130
23 PFTeDA			200.00	197.63	98.8	70 - 130
D 42 13C2_PFTeDA	977593	1024319			104.8	50 - 150
35 PFHxDA			200.00	205.20	102.6	70 - 130
D 40 13C2_PFHxDA	482998	494826			102.4	50 - 150
36 PFODA			200.00	159.64	79.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321028.d
Injection Date: 03-Aug-2021 13:15:12 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 16
Sample Info: CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1284187			108.4	50 - 150
8 PFBA			1000.00	884.58	88.5	70 - 130
D 50 13C5_PFPeA	1263824	1188281			94	50 - 150
21 PFPeA			1000.00	958.06	95.8	70 - 130
7 PFBS			884.00	801.42	90.7	70 - 130
D 44 13C3_PFBS	312372	360939			115.5	50 - 150
1 4:2 FTS			934.00	1038.41	111.2	70 - 130
D 63 13C2_4:2 FTS_2	369798	314426			85	50 - 150
D 49 13C5_PFHxA	1074983	1061998			98.8	50 - 150
15 PFHxA			1000.00	955.03	95.5	70 - 130
22 PFPeS			938.00	808.85	86.2	70 - 130
28 GenX			2000.00	2472.23	123.6	70 - 130
D 66 13C3_GenX	701708	716093			102	50 - 150
D 47 13C4_PFHpA	1078744	1181049			109.5	50 - 150
13 PFHpA			1000.00	793.41	79.3	70 - 130
D 45 13C3_PFHxS	306958	335435			109.3	50 - 150
14 PFHxS			910.00	791.80	87	70 - 130
29 ADONA			942.00	888.90	94.4	70 - 130
D 64 13C2_6:2 FTS_2	297562	305395			102.6	50 - 150
2 6:2 FTS			948.00	1179.38	124.4	70 - 130
20 PFOA			1000.00	871.36	87.1	70 - 130
D 53 13C8_PFOA	1021364	1135943			111.2	50 - 150
12 PFHpS			952.00	819.73	86.1	70 - 130
D 54 13C8_PFOS	258986	275889			106.5	50 - 150
18 PFOS			928.00	828.81	89.3	70 - 130
17 PFNA			1000.00	759.03	75.9	70 - 130
D 56 13C9_PFNA	1016403	1311897			129.1	50 - 150
30 9Cl-PF3ONS			932.00	853.98	91.6	70 - 130
D 55 13C8_PFOSA	491853	449293			91.3	50 - 150
19 PFOSA			1000.00	1106.28	110.6	70 - 130
16 PFNS			960.00	860.42	89.6	70 - 130
3 8:2 FTS			958.00	1021.25	106.6	70 - 130
D 65 13C2_8:2 FTS_2	286368	270628			94.5	50 - 150
10 PFDA			1000.00	951.70	95.2	70 - 130
D 51 13C6_PFDA	988943	968760			98	50 - 150
D 58 d3-MeFOSAA	1304722	1260144			96.6	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1007.79	100.8	70 - 130
9 PFDS			964.00	896.49	93	70 - 130
25 PFUdA			1000.00	957.41	95.7	70 - 130
D 60 d5-EtFOSAA	1171880	1081556			92.3	50 - 150
D 52 13C7_PFUdA	820462	851741			103.8	50 - 150
5 N-EtFOSAA			1000.00	1078.20	107.8	70 - 130
D 61 d7-MeFOSE	147736	143804			97.3	50 - 150
32 MeFOSE			1000.00	1034.00	103.4	70 - 130
26 MeFOSA			1000.00	1251.81	125.2	70 - 130
D 57 d3-MeFOSA	85068	60120			70.7	50 - 150
31 11Cl-PF3OUDS			942.00	776.77	82.5	70 - 130
D 62 d9-EtFOSE	149942	139779			93.2	50 - 150
33 EtFOSE			1000.00	1031.72	103.2	70 - 130
D 59 d5-EtFOSA	61503	59161			96.2	50 - 150
27 EtFOSA			1000.00	955.32	95.5	70 - 130
D 38 13C2_PFDoA	898934	898105			99.9	50 - 150
11 PFDoA			1000.00	916.71	91.7	70 - 130
4 10:2 FTS			964.00	1002.90	104	70 - 130
34 PFDOS			968.00	812.08	83.9	70 - 130
24 PFTrDA			1000.00	863.97	86.4	70 - 130
23 PFTeDA			1000.00	999.70	100	70 - 130
D 42 13C2_PFTeDA	977593	1044027			106.8	50 - 150
35 PFHxDA			1000.00	976.06	97.6	70 - 130
D 40 13C2_PFHxDA	482998	469444			97.2	50 - 150
36 PFODA			1000.00	792.35	79.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321040.d
Injection Date: 03-Aug-2021 15:22:17 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 27
Sample Info: CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1193730			100.7	50 - 150
8 PFBA			1000.00	914.54	91.5	70 - 130
D 50 13C5_PFPeA	1263824	1146092			90.7	50 - 150
21 PFPeA			1000.00	984.75	98.5	70 - 130
7 PFBS			884.00	824.23	93.2	70 - 130
D 44 13C3_PFBS	312372	329568			105.5	50 - 150
1 4:2 FTS			934.00	1091.64	116.9	70 - 130
D 63 13C2_4:2 FTS_2	369798	316907			85.7	50 - 150
D 49 13C5_PFHxA	1074983	1030253			95.8	50 - 150
15 PFHxA			1000.00	913.11	91.3	70 - 130
22 PFPeS			938.00	849.50	90.6	70 - 130
28 GenX			2000.00	2560.30	128	70 - 130
D 66 13C3_GenX	701708	659682			94	50 - 150
D 47 13C4_PFHpA	1078744	1099561			101.9	50 - 150
13 PFHpA			1000.00	765.29	76.5	70 - 130
D 45 13C3_PFHxS	306958	293997			95.8	50 - 150
14 PFHxS			910.00	828.90	91.1	70 - 130
29 ADONA			942.00	1019.41	108.2	70 - 130
D 64 13C2_6:2 FTS_2	297562	298479			100.3	50 - 150
2 6:2 FTS			948.00	1136.26	119.9	70 - 130
20 PFOA			1000.00	908.62	90.9	70 - 130
D 53 13C8_PFOA	1021364	1054515			103.2	50 - 150
12 PFHpS			952.00	893.77	93.9	70 - 130
D 54 13C8_PFOS	258986	249359			96.3	50 - 150
18 PFOS			928.00	876.49	94.4	70 - 130
17 PFNA			1000.00	922.57	92.3	70 - 130
D 56 13C9_PFNA	1016403	1032602			101.6	50 - 150
30 9Cl-PF3ONS			932.00	877.88	94.2	70 - 130
D 55 13C8_PFOSA	491853	567516			115.4	50 - 150
19 PFOSA			1000.00	821.08	82.1	70 - 130
16 PFNS			960.00	897.89	93.5	70 - 130
3 8:2 FTS			958.00	955.60	99.7	70 - 130
D 65 13C2_8:2 FTS_2	286368	262214			91.6	50 - 150
10 PFDA			1000.00	1118.28	111.8	70 - 130
D 51 13C6_PFDA	988943	769313			77.8	50 - 150
D 58 d3-MeFOSAA	1304722	1185599			90.9	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1053.91	105.4	70 - 130
9 PFDS			964.00	950.78	98.6	70 - 130
25 PFUdA			1000.00	882.52	88.3	70 - 130
D 60 d5-EtFOSAA	1171880	985770			84.1	50 - 150
D 52 13C7_PFUdA	820462	884754			107.8	50 - 150
5 N-EtFOSAA			1000.00	1222.19	122.2	70 - 130
D 61 d7-MeFOSE	147736	142385			96.4	50 - 150
32 MeFOSE			1000.00	1121.22	112.1	70 - 130
26 MeFOSA			1000.00	989.56	99	70 - 130
D 57 d3-MeFOSA	85068	64849			76.2	50 - 150
31 11Cl-PF3OUDS			942.00	808.25	85.8	70 - 130
D 62 d9-EtFOSE	149942	134568			89.7	50 - 150
33 EtFOSE			1000.00	1018.46	101.8	70 - 130
D 59 d5-EtFOSA	61503	59816			97.3	50 - 150
27 EtFOSA			1000.00	925.04	92.5	70 - 130
D 38 13C2_PFDoA	898934	844494			93.9	50 - 150
11 PFDoA			1000.00	959.02	95.9	70 - 130
4 10:2 FTS			964.00	877.92	91.1	70 - 130
34 PFDOS			968.00	856.20	88.5	70 - 130
24 PFTrDA			1000.00	841.13	84.1	70 - 130
23 PFTeDA			1000.00	1013.76	101.4	70 - 130
D 42 13C2_PFTeDA	977593	940482			96.2	50 - 150
35 PFHxDA			1000.00	1151.02	115.1	70 - 130
D 40 13C2_PFHxDA	482998	361804			74.9	50 - 150
36 PFODA			1000.00	1008.22	100.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321051.d
Injection Date: 03-Aug-2021 17:18:53 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 37
Sample Info: CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1134721			95.7	50 - 150
8 PFBA			1000.00	890.12	89	70 - 130
D 50 13C5_PFPeA	1263824	1159723			91.8	50 - 150
21 PFPeA			1000.00	910.96	91.1	70 - 130
7 PFBS			884.00	760.67	86	70 - 130
D 44 13C3_PFBS	312372	318550			102	50 - 150
1 4:2 FTS			934.00	1206.74	129.2	70 - 130
D 63 13C2_4:2 FTS_2	369798	320627			86.7	50 - 150
D 49 13C5_PFHxA	1074983	1006652			93.6	50 - 150
15 PFHxA			1000.00	873.37	87.3	70 - 130
22 PFPeS			938.00	905.59	96.5	70 - 130
28 GenX			2000.00	2330.15	116.5	70 - 130
D 66 13C3_GenX	701708	634755			90.5	50 - 150
D 47 13C4_PFHpA	1078744	887643			82.3	50 - 150
13 PFHpA			1000.00	921.36	92.1	70 - 130
D 45 13C3_PFHxS	306958	274210			89.3	50 - 150
14 PFHxS			910.00	859.73	94.5	70 - 130
29 ADONA			942.00	1004.71	106.7	70 - 130
D 64 13C2_6:2 FTS_2	297562	257546			86.6	50 - 150
2 6:2 FTS			948.00	1177.40	124.2	70 - 130
20 PFOA			1000.00	861.39	86.1	70 - 130
D 53 13C8_PFOA	1021364	957299			93.7	50 - 150
12 PFHpS			952.00	857.62	90.1	70 - 130
D 54 13C8_PFOS	258986	245946			95	50 - 150
18 PFOS			928.00	759.07	81.8	70 - 130
17 PFNA			1000.00	1055.74	105.6	70 - 130
D 56 13C9_PFNA	1016403	970674			95.5	50 - 150
30 9Cl-PF3ONS			932.00	838.87	90	70 - 130
D 55 13C8_PFOSA	491853	412102			83.8	50 - 150
19 PFOSA			1000.00	1033.58	103.4	70 - 130
16 PFNS			960.00	806.16	84	70 - 130
3 8:2 FTS			958.00	966.38	100.9	70 - 130
D 65 13C2_8:2 FTS_2	286368	258704			90.3	50 - 150
10 PFDA			1000.00	932.12	93.2	70 - 130
D 51 13C6_PFDA	988943	881524			89.1	50 - 150
D 58 d3-MeFOSAA	1304722	1116152			85.5	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1063.62	106.4	70 - 130
9 PFDS			964.00	762.17	79.1	70 - 130
25 PFUdA			1000.00	990.16	99	70 - 130
D 60 d5-EtFOSAA	1171880	1023644			87.4	50 - 150
D 52 13C7_PFUdA	820462	724513			88.3	50 - 150
5 N-EtFOSAA			1000.00	1003.41	100.3	70 - 130
D 61 d7-MeFOSE	147736	128865			87.2	50 - 150
32 MeFOSE			1000.00	1062.94	106.3	70 - 130
26 MeFOSA			1000.00	1118.20	111.8	70 - 130
D 57 d3-MeFOSA	85068	54784			64.4	50 - 150
31 11Cl-PF3OUDS			942.00	732.10	77.7	70 - 130
D 62 d9-EtFOSE	149942	126317			84.2	50 - 150
33 EtFOSE			1000.00	991.11	99.1	70 - 130
D 59 d5-EtFOSA	61503	58224			94.7	50 - 150
27 EtFOSA			1000.00	1098.63	109.9	70 - 130
D 38 13C2_PFDoA	898934	763926			85	50 - 150
11 PFDoA			1000.00	945.38	94.5	70 - 130
4 10:2 FTS			964.00	894.51	92.8	70 - 130
34 PFDOS			968.00	812.76	84	70 - 130
24 PFTrDA			1000.00	913.73	91.4	70 - 130
23 PFTeDA			1000.00	922.45	92.2	70 - 130
D 42 13C2_PFTeDA	977593	921705			94.3	50 - 150
35 PFHxDA			1000.00	1015.84	101.6	70 - 130
D 40 13C2_PFHxDA	482998	373716			77.4	50 - 150
36 PFODA			1000.00	870.90	87.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321062.d
Injection Date: 03-Aug-2021 19:15:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 47
Sample Info: CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1277954			107.8	50 - 150
8 PFBA			1000.00	887.50	88.8	70 - 130
D 50 13C5_PFPeA	1263824	1378425			109.1	50 - 150
21 PFPeA			1000.00	810.31	81	70 - 130
7 PFBS			884.00	837.36	94.7	70 - 130
D 44 13C3_PFBS	312372	347251			111.2	50 - 150
1 4:2 FTS			934.00	987.54	105.7	70 - 130
D 63 13C2_4:2 FTS_2	369798	354000			95.7	50 - 150
D 49 13C5_PFHxA	1074983	1048870			97.6	50 - 150
15 PFHxA			1000.00	1013.40	101.3	70 - 130
22 PFPeS			938.00	879.94	93.8	70 - 130
28 GenX			2000.00	2450.52	122.5	70 - 130
D 66 13C3_GenX	701708	715702			102	50 - 150
D 47 13C4_PFHpA	1078744	1157994			107.3	50 - 150
13 PFHpA			1000.00	796.74	79.7	70 - 130
D 45 13C3_PFHxS	306958	304029			99	50 - 150
14 PFHxS			910.00	850.55	93.5	70 - 130
29 ADONA			942.00	949.42	100.8	70 - 130
D 64 13C2_6:2 FTS_2	297562	306090			102.9	50 - 150
2 6:2 FTS			948.00	1307.08	137.9	70 - 130
20 PFOA			1000.00	972.43	97.2	70 - 130
D 53 13C8_PFOA	1021364	1130229			110.7	50 - 150
12 PFHpS			952.00	907.01	95.3	70 - 130
D 54 13C8_PFOS	258986	263883			101.9	50 - 150
18 PFOS			928.00	894.92	96.4	70 - 130
17 PFNA			1000.00	894.19	89.4	70 - 130
D 56 13C9_PFNA	1016403	1163592			114.5	50 - 150
30 9Cl-PF3ONS			932.00	858.72	92.1	70 - 130
D 55 13C8_PFOSA	491853	435903			88.6	50 - 150
19 PFOSA			1000.00	1126.12	112.6	70 - 130
16 PFNS			960.00	946.29	98.6	70 - 130
3 8:2 FTS			958.00	833.13	87	70 - 130
D 65 13C2_8:2 FTS_2	286368	300413			104.9	50 - 150
10 PFDA			1000.00	780.24	78	70 - 130
D 51 13C6_PFDA	988943	1093785			110.6	50 - 150
D 58 d3-MeFOSAA	1304722	1242374			95.2	50 - 150

Report Date: 04-Aug-2021 18:09:50 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\080321-DOD.b\080321062.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1060.13	106	70 - 130
9 PFDS			964.00	947.57	98.3	70 - 130
25 PFUdA			1000.00	1046.88	104.7	70 - 130
D 60 d5-EtFOSAA	1171880	1159668			99	50 - 150
D 52 13C7_PFUdA	820462	809101			98.6	50 - 150
5 N-EtFOSAA			1000.00	1008.54	100.9	70 - 130
D 61 d7-MeFOSE	147736	152693			103.4	50 - 150
32 MeFOSE			1000.00	1026.33	102.6	70 - 130
26 MeFOSA			1000.00	1202.27	120.2	70 - 130
D 57 d3-MeFOSA	85068	59014			69.4	50 - 150
31 11Cl-PF3OUDS			942.00	879.57	93.4	70 - 130
D 62 d9-EtFOSE	149942	147986			98.7	50 - 150
33 EtFOSE			1000.00	992.81	99.3	70 - 130
D 59 d5-EtFOSA	61503	65784			107	50 - 150
27 EtFOSA			1000.00	924.61	92.5	70 - 130
D 38 13C2_PFDoA	898934	892406			99.3	50 - 150
11 PFDoA			1000.00	909.18	90.9	70 - 130
4 10:2 FTS			964.00	914.27	94.8	70 - 130
34 PFDOS			968.00	852.13	88	70 - 130
24 PFTrDA			1000.00	894.25	89.4	70 - 130
23 PFTeDA			1000.00	917.83	91.8	70 - 130
D 42 13C2_PFTeDA	977593	1087540			111.2	50 - 150
35 PFHxDA			1000.00	1005.17	100.5	70 - 130
D 40 13C2_PFHxDA	482998	420924			87.1	50 - 150
36 PFODA			1000.00	879.65	88	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321069.d
Injection Date: 03-Aug-2021 20:30:07 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 53
Sample Info: CCV 1000D_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1294282			109.2	50 - 150
8 PFBA			1000.00	907.81	90.8	70 - 130
D 50 13C5_PFPeA	1263824	1251074			99	50 - 150
21 PFPeA			1000.00	893.38	89.3	70 - 130
7 PFBS			884.00	759.58	85.9	70 - 130
D 44 13C3_PFBS	312372	376863			120.6	50 - 150
1 4:2 FTS			934.00	1017.42	108.9	70 - 130
D 63 13C2_4:2 FTS_2	369798	362289			98	50 - 150
D 49 13C5_PFHxA	1074983	1158723			107.8	50 - 150
15 PFHxA			1000.00	867.21	86.7	70 - 130
22 PFPeS			938.00	848.88	90.5	70 - 130
28 GenX			2000.00	2453.01	122.7	70 - 130
D 66 13C3_GenX	701708	699740			99.7	50 - 150
D 47 13C4_PFHpA	1078744	1174986			108.9	50 - 150
13 PFHpA			1000.00	769.52	77	70 - 130
D 45 13C3_PFHxS	306958	319755			104.2	50 - 150
14 PFHxS			910.00	872.28	95.9	70 - 130
29 ADONA			942.00	1010.90	107.3	70 - 130
D 64 13C2_6:2 FTS_2	297562	294436			98.9	50 - 150
2 6:2 FTS			948.00	1477.02	155.8	70 - 130
20 PFOA			1000.00	909.51	91	70 - 130
D 53 13C8_PFOA	1021364	1122898			109.9	50 - 150
12 PFHpS			952.00	880.73	92.5	70 - 130
D 54 13C8_PFOS	258986	279538			107.9	50 - 150
18 PFOS			928.00	860.73	92.8	70 - 130
17 PFNA			1000.00	859.10	85.9	70 - 130
D 56 13C9_PFNA	1016403	1139426			112.1	50 - 150
30 9Cl-PF3ONS			932.00	827.59	88.8	70 - 130
D 55 13C8_PFOSA	491853	498027			101.3	50 - 150
19 PFOSA			1000.00	1050.96	105.1	70 - 130
16 PFNS			960.00	892.57	93	70 - 130
3 8:2 FTS			958.00	832.82	86.9	70 - 130
D 65 13C2_8:2 FTS_2	286368	316980			110.7	50 - 150
10 PFDA			1000.00	862.61	86.3	70 - 130
D 51 13C6_PFDA	988943	1057240			106.9	50 - 150
D 58 d3-MeFOSAA	1304722	1246819			95.6	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1013.40	101.3	70 - 130
9 PFDS			964.00	974.80	101.1	70 - 130
25 PFUdA			1000.00	978.06	97.8	70 - 130
D 60 d5-EtFOSAA	1171880	1133052			96.7	50 - 150
D 52 13C7_PFUdA	820462	867849			105.8	50 - 150
5 N-EtFOSAA			1000.00	1029.86	103	70 - 130
D 61 d7-MeFOSE	147736	144237			97.6	50 - 150
32 MeFOSE			1000.00	1085.00	108.5	70 - 130
26 MeFOSA			1000.00	1022.74	102.3	70 - 130
D 57 d3-MeFOSA	85068	70675			83.1	50 - 150
31 11Cl-PF3OUDS			942.00	791.23	84	70 - 130
D 62 d9-EtFOSE	149942	140200			93.5	50 - 150
33 EtFOSE			1000.00	1070.63	107.1	70 - 130
D 59 d5-EtFOSA	61503	65540			106.6	50 - 150
27 EtFOSA			1000.00	1070.61	107.1	70 - 130
D 38 13C2_PFDoA	898934	879715			97.9	50 - 150
11 PFDoA			1000.00	913.79	91.4	70 - 130
4 10:2 FTS			964.00	790.57	82	70 - 130
34 PFDOS			968.00	789.86	81.6	70 - 130
24 PFTrDA			1000.00	921.33	92.1	70 - 130
23 PFTeDA			1000.00	934.16	93.4	70 - 130
D 42 13C2_PFTeDA	977593	1043230			106.7	50 - 150
35 PFHxDA			1000.00	1079.53	108	70 - 130
D 40 13C2_PFHxDA	482998	432419			89.5	50 - 150
36 PFODA			1000.00	921.35	92.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321070.d
Injection Date: 03-Aug-2021 20:40:42 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 100
Sample Info: CCB C5 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1314377			110.9	50 - 150
8 PFBA			1000.00	1.5037	0.2	70 - 130
D 50 13C5_PFPeA	1263824	1286500			101.8	50 - 150
21 PFPeA						
7 PFBS						
D 44 13C3_PFBS	312372	363925			116.5	50 - 150
1 4:2 FTS						
D 63 13C2_4:2 FTS_2	369798	404597			109.4	50 - 150
D 49 13C5_PFHxA	1074983	1054982			98.1	50 - 150
15 PFHxA						
22 PFPeS						
28 GenX						
D 66 13C3_GenX	701708	842222			120	50 - 150
D 47 13C4_PFHpA	1078744	1163960			107.9	50 - 150
13 PFHpA						
D 45 13C3_PFHxS	306958	303947			99	50 - 150
14 PFHxS						
29 ADONA						
D 64 13C2_6:2 FTS_2	297562	323758			108.8	50 - 150
2 6:2 FTS						
20 PFOA						
D 53 13C8_PFOA	1021364	1196562			117.2	50 - 150
12 PFHpS						
D 54 13C8_PFOS	258986	277378			107.1	50 - 150
18 PFOS			928.00	3.5848	0.4	70 - 130
17 PFNA						
D 56 13C9_PFNA	1016403	1055421			103.8	50 - 150
30 9Cl-PF3ONS			932.00	0.14974	0	70 - 130
D 55 13C8_PFOSA	491853	531132			108	50 - 150
19 PFOSA						
16 PFNS						
3 8:2 FTS						
D 65 13C2_8:2 FTS_2	286368	341091			119.1	50 - 150
10 PFDA						
D 51 13C6_PFDA	988943	917131			92.7	50 - 150
D 58 d3-MeFOSAA	1304722	1411098			108.2	50 - 150

Report Date: 04-Aug-2021 18:08:40 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\080321-DOD.b\080321070.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1.9409	0.2	70 - 130
9 PFDS						
25 PFUdA						
D 60 d5-EtFOSAA	1171880	1350815			115.3	50 - 150
D 52 13C7_PFUdA	820462	833578			101.6	50 - 150
5 N-EtFOSAA						
D 61 d7-MeFOSE	147736	163887			110.9	50 - 150
32 MeFOSE			1000.00	7.3817	0.7	70 - 130
26 MeFOSA						
D 57 d3-MeFOSA	85068	71466			84	50 - 150
31 11Cl-PF3OUDS			942.00	0.56361	0.1	70 - 130
D 62 d9-EtFOSE	149942	162179			108.2	50 - 150
33 EtFOSE						
D 59 d5-EtFOSA	61503	69613			113.2	50 - 150
27 EtFOSA						
D 38 13C2_PFDoA	898934	867325			96.5	50 - 150
11 PFDoA						
4 10:2 FTS						
34 PFDOS						
24 PFTrDA						
23 PFTeDA						
D 42 13C2_PFTeDA	977593	1089646			111.5	50 - 150
35 PFHxDA			1000.00	10.141	1	70 - 130
D 40 13C2_PFHxDA	482998	559339			115.8	50 - 150
36 PFODA						

SCIEX
The Power of Precision

SCIEX Triple Quad™ 4500/4500MD Systems

Planned Maintenance Procedure



GEN-IDV-08-6710-E

October 2020

This document is provided to customers who have purchased SCIEX equipment to use in the operation of such SCIEX equipment. This document is copyright protected and any reproduction of this document or any part of this document is strictly prohibited, except as SCIEX may authorize in writing.

Software that may be described in this document is furnished under a license agreement. It is against the law to copy, modify, or distribute the software on any medium, except as specifically allowed in the license agreement. Furthermore, the license agreement may prohibit the software from being disassembled, reverse engineered, or decompiled for any purpose. Warranties are as stated therein.

Portions of this document may make reference to other manufacturers and/or their products, which may contain parts whose names are registered as trademarks and/or function as trademarks of their respective owners. Any such use is intended only to designate those manufacturers' products as supplied by SCIEX for incorporation into its equipment and does not imply any right and/or license to use or permit others to use such manufacturers' and/or their product names as trademarks.

SCIEX warranties are limited to those express warranties provided at the time of sale or license of its products and are the sole and exclusive representations, warranties, and obligations of SCIEX. SCIEX makes no other warranty of any kind whatsoever, expressed or implied, including without limitation, warranties of merchantability or fitness for a particular purpose, whether arising from a statute or otherwise in law or from a course of dealing or usage of trade, all of which are expressly disclaimed, and assumes no responsibility or contingent liability, including indirect or consequential damages, for any use by the purchaser or for any adverse circumstances arising therefrom.
(GEN-IDV-09-10816-C)

SCIEX Diagnostics products are for *in vitro* diagnostic use. Product(s) may not be available in all countries. For information on availability, please contact your local representative or refer to sciex.com. All other SCIEX products are for research use only. Not for use in diagnostic procedures.

Trademarks and/or registered trademarks mentioned herein, including associated logos, are the property of AB Sciex Pte. Ltd., or their respective owners, in the United States and/or certain other countries.

AB SCIEX™ is being used under license.

© 2020 DH Tech. Dev. Pte. Ltd.

EC REP

AB Sciex UK Limited
Phoenix House
Lakeside Drive, Centre Park
Warrington Cheshire
WA1 1RX, UK

AB Sciex Pte. Ltd.
Blk33, #04-06 Marsiling Industrial Estate Road 3
Woodlands Central Industrial Estate, Singapore 739256

Contents

1 Introduction....4

2 Planned Maintenance Tasks....5
Pre-Planned Maintenance....5
Pre-PM Tasks....5
PC Health Check....6
Vacuum System Tests....6
Pre-PM Pressure Test....7
Inspect for Contamination....7
Pre-PM System Tests....8
Planned Maintenance....13
Mass Spectrometer Maintenance....13
Turbo V™ Ion Source Maintenance....15
Software Maintenance....16
Post-Planned Maintenance....17
Voltage Tests....17
Post-PM Pressure Test....18
Inspect for Contamination....19
Post-PM System Tests....20
Post-PM Tasks....29
Wrap-up....31

3 Signoff....32
Comments and Exceptions....33

A Inspect for Contamination....34
Guidelines for Cleaning the Front End....34

Introduction 1

Note: For regulatory and safety information for the mass spectrometer, refer to the *System User Guide*.

The planned maintenance (PM) procedure is designed to help maintain overall system performance.

The PM is not intended to take the place of an Operational Qualification (OQ) nor is it intended to verify the instrument specifications. Separate Installation Qualification (IQ) and OQ services are available. Contact a SCIEX representative.

The procedure must be performed by a trained SCIEX Field Service Employee (FSE).

The procedure has been developed for the SCIEX Triple Quad™ 4500/4500MD System with the Turbo V™ Ion Source. It does not apply to any other products or processes.

The procedure does not address any customer-specific analytical protocol (performance qualification) or method validation.

Note: If an issue is identified and the system requires repair, then the customer is responsible for the repair at the expense of the customer, except to the extent that the system and the required repairs are covered by a SCIEX warranty or service contract. A separate repair service call must be opened and the repair hours must not be charged against this procedure.

Planned Maintenance Tasks 2

Note: Perform all procedures using the Turbo V™ Ion Source, unless otherwise specified.

Pre-Planned Maintenance

Note: Guideline values are for reference only. The pre-PM test results are not required to meet or exceed these values.

Pre-PM Tasks

Task	Complete	N/A
Ask the customer about system performance since the last visit and record comments.	✓	—
If the customer maintains a log for the system, then review it.	○	◉
Review the work to be performed with the customer.	✓	—

PC Health Check

Task	Complete	N/A
Inspect the status of the RAID 1 hard drives.	✓	—

Vacuum System Tests

Task			Complete
Record the turbo pump operational values. **Parameter** / **Results** Temperature (ºC) / 45 Current (A) / 3.9 Voltage (V) / 23 Power (W) / 87 Driving frequency (Hz) / 800			✓
Inspect the vacuum gauge filament using the Analyst® Service Diagnostics (ASD) Software and identify the filament position. If the mass spectrometer is using filament 2, then order a replacement vacuum gauge as a separate service call.	1	◉	✓
	2	○	

Pre-PM Pressure Test

Pre-PM Pressure Test is Complete	✓

Test	Guideline	Result
Vacuum chamber pressure with CAD gas off	0.4×10^{-5} torr ≤ $P_{CAD\ 0}$ ≤ 1.1×10^{-5} torr	0.4e-5
Pressure difference (CAD_{12} minus CAD_0)	1.8×10^{-5} torr ≤ ($P_{CAD\ 12} - P_{CAD\ 0}$) ≤ 2.8×10^{-5} torr	2.3e-5

Inspect for Contamination

Task	Complete	N/A
Inspect for front-end contamination. Refer to Inspect for Contamination.	✓	—

Pre-PM System Tests

Q1 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	≥ 8.0×10^6	3.1e7	0.6 to 0.8	0.93
500.380	≥ 8.0×10^6	3.7e7	0.6 to 0.8	0.71
906.673	≥ 2.0×10^7	6.2e7	0.6 to 0.8	0.75
1,952.427	≥ 8.8×10^5	8.0e6	0.6 to 0.8	0.71

Q3 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	≥ 8.0×10^6	4.1e7	0.6 to 0.8	0.73
500.380	≥ 8.0×10^6	3.6e7	0.6 to 0.8	0.75
906.673	≥ 2.0×10^7	6.2e7	0.6 to 0.8	0.59
1,952.427	≥ 8.8×10^5	1.3e7	0.6 to 0.8	0.65

Q1 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
933.636	≥ 1.8×10^7	3.0e7	0.6 to 0.8	0.65
1,863.306	≥ 1.4×10^6	4.1e6	0.6 to 0.8	0.68

Q3 Negative MS Test is Complete	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
933.636	≥ 1.8×10^7	3.0e7	0.6 to 0.8	0.65
1,863.306	≥ 2.0×10^6	4.1e6	0.6 to 0.8	0.68

Reserpine MS/MS Transmission Test is Complete	✓

- **Test solution:** Reserpine solution 0.167 pmol/µL
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s (both MS and MS/MS)
- **Scan mode:** Product Ion (MS2)
- **Product Of:** 609.3 (or as calibrated)
- **Product Ion:** 195.1
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.

Guideline	**Result**
Transmission efficiency $\frac{Intensity\ for\ ion\ at\ m/z\ 195.1}{Intensity\ for\ ion\ at\ m/z\ 609.3\ (or\ as\ calibrated)} \times 100 \geq 10\%$	14%

Planned Maintenance

Mass Spectrometer Maintenance

Task	Complete	N/A
Shut down the system and then disconnect the mains supply power cable.	✓	—
If required, replace the roughing pump oil. The recommended interval is every 3 years. **Note:** If an oil change is not required, then inspect the oil level and top up, if necessary. **CAUTION: Potential System Damage. Do not mix different types of oil. Mixing mineral oil with synthetic oil can cause pump failure.**	✓	—
If required, replace the roughing pump oil exhaust filter. The recommended interval is every 3 years.	○	◒
Confirm that there is no excessive roughing pump oil leakage. Clean up any oil.	✓	—
Make sure that the roughing pump exhaust is properly routed to the ventilation system.	✓	—

Planned Maintenance Tasks

Task	Complete	N/A
Inspect the exhaust system: • Make sure that all of the gas fittings at the rear bulkhead are tight. • Make sure that all of the exhaust hoses are free of kinks. • Make sure that all of the hoses at the waste bottle are secure, and there are no signs of leaks. • Make sure that the waste bottle is in an upright position. • Make sure that the exhaust hose is secured to the lab ventilation system. • Confirm that no liquid is trapped in the exhaust lines.	✓	—
Clean or replace the four air filters in the base of the mass spectrometer chassis.	✓	—
(If applicable) Clean the turbo pump filter screen.	○	◉
(If applicable) Verify the operation of the SCIEX-supplied bench cooling fans.	◉	○
Clean the curtain plate.	✓	—
Clean the orifice plate.	✓	—
Clean the QJet® Ion Guide and IQ0 lens.	✓	—
(If contamination is detected) Clean the Q0 region and the IQ1 lens.	○	◉
Inspect the cable connections: • Make sure that the power cables for the mass spectrometer, LC system, roughing pump, syringe pump, gas generator, and UPS are securely connected. • Make sure that the communications cables for the GPIB/Ethernet ports, LC connections, and roughing pump are securely connected.	✓	—

Task	Complete	N/A
Verify system support functions — gas: • Confirm the input gas pressures at the regulators are within specifications. • Confirm that there is no liquid present in the gas lines.	✓	—
Verify the expiry date on the battery system for the UPS (sold by SCIEX), and then recommend replacement of the battery tray, if required.	○	◒
Start up the system.	✓	—

Turbo V™ Ion Source Maintenance

Task	Complete	N/A
If necessary, replace the electrode in the TurboIonSpray® and APCI Probes.	◒	○
With the TurboIonSpray® probe installed, verify that the temperature (TEM) reaches the recommended set point of 500 °C.	✓	—
(If applicable) With the APCI probe installed, verify that the temperature (TEM) reaches the recommended set point of 400 °C.	○	◒
Inspect the ion source and, if visible signs of contamination are present, clean the inner surfaces using lint-free wipes and a 50:50 methanol:water solution. **Note:** Remove the corona discharge needle before cleaning.	○	◒

Software Maintenance

Note: This task is not applicable to MD systems.

Task	Complete	N/A
(Obtain customer approval first) Install any applicable Analyst® Software HotFixes. **Note:** Make sure that the compatible instrument firmware is installed.	○	◉

Post-Planned Maintenance

Voltage Tests

Task		Complete
Inspect the RF tuning voltages at the QPS amplifier module and then, if required, tune the coil boxes.		✓
Inspect the detector voltage. Optimize, if required.		✓
Detector voltage	1800	

Post-PM Pressure Test

Post-PM Pressure Test is Complete	✓

Test	Specification	Result
Vacuum chamber pressure with CAD gas off	0.4×10^{-5} torr $\leq P_{CAD\ 0} \leq 1.1 \times 10^{-5}$ torr	0.6e-5
Pressure difference (CAD_{12} minus CAD_0)	1.8×10^{-5} torr $\leq (P_{CAD\ 12} - P_{CAD\ 0}) \leq 2.8 \times 10^{-5}$ torr	2.3e-5

Inspect for Contamination

Task	Complete	N/A
Inspect for front-end contamination. Refer to Inspect for Contamination.	✓	—

Post-PM System Tests

Q1 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
175.133	≥ 8.0×10^6	2.9e7	0.6 to 0.8	0.73
500.380	≥ 8.0×10^6	3.2e7	0.6 to 0.8	0.72
906.673	≥ 2.0×10^7	4.8e7	0.6 to 0.8	0.72
1,952.427	≥ 8.8×10^5	5.5e6	0.6 to 0.8	0.60

Q1 Positive MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q3 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
175.133	≥ 8.0×10^6	3.5e7	0.6 to 0.8	0.75
500.380	≥ 8.0×10^6	2.9e7	0.6 to 0.8	0.75
906.673	≥ 2.0×10^7	5.0e7	0.6 to 0.8	0.62
1,952.427	≥ 8.8×10^5	9.6e6	0.6 to 0.8	0.64

Q3 Positive MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q1 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
933.636	≥ 1.8×10^7	2.9e7	0.6 to 0.8	0.64
1,863.306	≥ 1.4×10^6	5.3e6	0.6 to 0.8	0.70

Q1 Negative MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q3 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
933.636	≥ 1.8×10^7	3.6e7	0.6 to 0.8	0.69
1,863.306	≥ 2.0×10^6	5.4e6	0.6 to 0.8	0.73

Q3 Negative MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Reserpine MS/MS Transmission Test is Complete	✓

- **Test solution:** Reserpine solution 0.167 pmol/µL
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s (both MS and MS/MS)
- **Scan mode:** Product Ion (MS2)
- **Product Of:** 609.3 (or as calibrated)
- **Product Ion:** 195.1
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.

Specification	**Result**
Transmission efficiency $\frac{Intensity\ for\ ion\ at\ m/z\ 195.1}{Intensity\ for\ ion\ at\ m/z\ 609.3\ (or\ as\ calibrated)} \times 100 \geq 10\%$	11.8%

Post-PM Tasks

Task	Complete	N/A
Delete any unnecessary files.	✓	—
Back up the Analyst Data folder.	✓	—
(If applicable) Defragment the hard drive.	○	◉
(Not applicable for MD instrument families) If the customer has a Software Support Plan, then perform the Software Health Check: • (Obtain customer approval first) Install any compatible HotFixes and updates for SCIEX add-on software.	○	◉

StatusScope® Remote Monitoring Service Tasks

The StatusScope® Remote Monitoring Service is not applicable for MD systems.

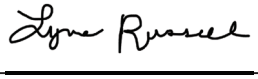
Planned Maintenance Tasks

Task	Complete	N/A
Note: Installation of the StatusScope® Remote Monitoring Service is available only to warranty and eligible contract customers. Refer to sciex.com/instrument-service-and-support/statusscope-remote-monitoring for a list of eligible contracts. If the StatusScope® Remote Monitoring Service is not installed, then perform these tasks: • If the customer does not want the StatusScope® Remote Monitoring Service installed, then skip the remaining steps in this section. • If the customer wants the StatusScope® Remote Monitoring Service installed, then complete the steps in this section.	○	◒
Verify the connection to the server for the StatusScope® Remote Monitoring Service. **Note:** Use the **StatusScopePortCheck.exe**. The utility is included with the StatusScope® installer.	○	◒
Install the agent for the StatusScope® Remote Monitoring Service.	○	◒
Ask the customer to log on to SCIEX Now™ to verify that the instrument is connected to the server for the StatusScope® Remote Monitoring Service. **Note:** The instrument is shown under the account of the Primary Contact.	○	◒

Wrap-up

Task	Complete	N/A
Review the work performed with the customer.	✓	—
Record the test results in this document and then attach all of the test data.	✓	—
Review the routine maintenance schedule and the procedures with the customer.	✓	—
Complete this document: • Review the test results with the customer. • Provide the customer with the completed document and the test data. • If an electronic copy of the document is supplied to the customer, then save a copy on the Service drive.	✓	—

Signoff 3

Organization	Pace South Carolina		
Mass spectrometer serial number	BJ29321608	Service request number	
FSE name	Lynne Russell	Date (yyyy-mm-dd)	2021-03-17
FSE signature			

Comments and Exceptions

Inspect for Contamination A

Perform a Q1 and Q3 charging test to determine whether front end contamination is present.

1. Run the **Pos PPG** method for 10 minutes, monitoring the Total Ion Count (TIC) for degradation of the signal or a decrease in sensitivity.
2. Change the polarity to Negative, and then scan for one minute.
3. Change the polarity to Positive, and then make sure that the **IS** parameter returns to the original value.
4. Run the method.

   If the signal sensitivity is restored temporarily but the Total Ion Count (TIC) again degrades by more than 5% over a 10 minute run, then a possible front-end contamination is indicated.
5. Repeat the test in Negative polarity using the Q1 Neg PPG method.

Guidelines for Cleaning the Front End

If charging tests indicate that cleaning is necessary, then clean the front-end components, including the QJet® Ion Guide, IQ0 lens, Q0 quadrupole, and IQ1 lens.

Removing the ion optics is considered a repair activity. FSEs must open a separate service repair call.

Note: This procedure does not provide troubleshooting for all technical root causes of signal degradation or charging effect. Signal degradation might also result from a contaminated TurboIonSpray® Probe or electrode, method parameters that are not optimized, or other factors.

SCIEX
The Power of Precision

SCIEX Triple Quad™ 4500/4500MD Systems

Planned Maintenance Procedure



GEN-IDV-08-6710-E

October 2020

This document is provided to customers who have purchased SCIEX equipment to use in the operation of such SCIEX equipment. This document is copyright protected and any reproduction of this document or any part of this document is strictly prohibited, except as SCIEX may authorize in writing.

Software that may be described in this document is furnished under a license agreement. It is against the law to copy, modify, or distribute the software on any medium, except as specifically allowed in the license agreement. Furthermore, the license agreement may prohibit the software from being disassembled, reverse engineered, or decompiled for any purpose. Warranties are as stated therein.

Portions of this document may make reference to other manufacturers and/or their products, which may contain parts whose names are registered as trademarks and/or function as trademarks of their respective owners. Any such use is intended only to designate those manufacturers' products as supplied by SCIEX for incorporation into its equipment and does not imply any right and/or license to use or permit others to use such manufacturers' and/or their product names as trademarks.

SCIEX warranties are limited to those express warranties provided at the time of sale or license of its products and are the sole and exclusive representations, warranties, and obligations of SCIEX. SCIEX makes no other warranty of any kind whatsoever, expressed or implied, including without limitation, warranties of merchantability or fitness for a particular purpose, whether arising from a statute or otherwise in law or from a course of dealing or usage of trade, all of which are expressly disclaimed, and assumes no responsibility or contingent liability, including indirect or consequential damages, for any use by the purchaser or for any adverse circumstances arising therefrom.
(GEN-IDV-09-10816-C)

SCIEX Diagnostics products are for *in vitro* diagnostic use. Product(s) may not be available in all countries. For information on availability, please contact your local representative or refer to sciex.com. All other SCIEX products are for research use only. Not for use in diagnostic procedures.

Trademarks and/or registered trademarks mentioned herein, including associated logos, are the property of AB Sciex Pte. Ltd., or their respective owners, in the United States and/or certain other countries.

AB SCIEX™ is being used under license.

© 2020 DH Tech. Dev. Pte. Ltd.

EC REP

AB Sciex UK Limited
Phoenix House
Lakeside Drive, Centre Park
Warrington Cheshire
WA1 1RX, UK

AB Sciex Pte. Ltd.
Blk33, #04-06 Marsiling Industrial Estate Road 3
Woodlands Central Industrial Estate, Singapore 739256

Contents

1 Introduction....4

2 Planned Maintenance Tasks....5
Pre-Planned Maintenance....5
Pre-PM Tasks....5
PC Health Check....6
Vacuum System Tests....6
Pre-PM Pressure Test....7
Inspect for Contamination....7
Pre-PM System Tests....8
Planned Maintenance....13
Mass Spectrometer Maintenance....13
Turbo V™ Ion Source Maintenance....15
Software Maintenance....16
Post-Planned Maintenance....17
Voltage Tests....17
Post-PM Pressure Test....18
Inspect for Contamination....19
Post-PM System Tests....20
Post-PM Tasks....29
Wrap-up....31

3 Signoff....32
Comments and Exceptions....33

A Inspect for Contamination....34
Guidelines for Cleaning the Front End....34

Introduction 1

Note: For regulatory and safety information for the mass spectrometer, refer to the *System User Guide*.

The planned maintenance (PM) procedure is designed to help maintain overall system performance.

The PM is not intended to take the place of an Operational Qualification (OQ) nor is it intended to verify the instrument specifications. Separate Installation Qualification (IQ) and OQ services are available. Contact a SCIEX representative.

The procedure must be performed by a trained SCIEX Field Service Employee (FSE).

The procedure has been developed for the SCIEX Triple Quad™ 4500/4500MD System with the Turbo V™ Ion Source. It does not apply to any other products or processes.

The procedure does not address any customer-specific analytical protocol (performance qualification) or method validation.

Note: If an issue is identified and the system requires repair, then the customer is responsible for the repair at the expense of the customer, except to the extent that the system and the required repairs are covered by a SCIEX warranty or service contract. A separate repair service call must be opened and the repair hours must not be charged against this procedure.

Planned Maintenance Tasks 2

Note: Perform all procedures using the Turbo V™ Ion Source, unless otherwise specified.

Pre-Planned Maintenance

Note: Guideline values are for reference only. The pre-PM test results are not required to meet or exceed these values.

Pre-PM Tasks

Task	Complete	N/A
Ask the customer about system performance since the last visit and record comments.	✓	—
If the customer maintains a log for the system, then review it.	○	◉
Review the work to be performed with the customer.	✓	—

PC Health Check

Task	Complete	N/A
Inspect the status of the RAID 1 hard drives.		—

Vacuum System Tests

Task			Complete
Record the turbo pump operational values. **Parameter** / **Results** Temperature (ºC) — see notes Current (A) — see notes Voltage (V) — see notes Power (W) — see notes Driving frequency (Hz) — see notes			
Inspect the vacuum gauge filament using the Analyst® Service Diagnostics (ASD) Software and identify the filament position. If the mass spectrometer is using filament 2, then order a replacement vacuum gauge as a separate service call.	1	○	
	2	○	

Pre-PM Pressure Test

Pre-PM Pressure Test is Complete	✓

Test	Guideline	Result
Vacuum chamber pressure with CAD gas off	0.4×10^{-5} torr $\leq P_{CAD\ 0} \leq 1.1 \times 10^{-5}$ torr	0.4e-5
Pressure difference (CAD_{12} minus CAD_0)	1.8×10^{-5} torr $\leq (P_{CAD\ 12} - P_{CAD\ 0}) \leq 2.8 \times 10^{-5}$ torr	2.1e-5

Inspect for Contamination

Task	Complete	N/A
Inspect for front-end contamination. Refer to Inspect for Contamination.	✓	—

Pre-PM System Tests

Q1 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	≥ 8.0×10^6	2.5e7	0.6 to 0.8	0.87
500.380	≥ 8.0×10^6	2.4e7	0.6 to 0.8	0.81
906.673	≥ 2.0×10^7	3.9e7	0.6 to 0.8	0.79
1,952.427	≥ 8.8×10^5	7.7e6	0.6 to 0.8	1.1

Q3 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	≥ 8.0×10^6	3.0e7	0.6 to 0.8	0.75
500.380	≥ 8.0×10^6	2.7e7	0.6 to 0.8	0.81
906.673	≥ 2.0×10^7	4.7e7	0.6 to 0.8	0.78
1,952.427	≥ 8.8×10^5	7.8e6	0.6 to 0.8	0.85

Q1 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
933.636	≥ 1.8×10^7	2.4e7	0.6 to 0.8	0.65
1,863.306	≥ 1.4×10^6	3.7e6	0.6 to 0.8	0.73

Q3 Negative MS Test is Complete	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
933.636	≥ 1.8×10^7	3.1e7	0.6 to 0.8	0.79
1,863.306	≥ 2.0×10^6	6.2e6	0.6 to 0.8	0.76

Reserpine MS/MS Transmission Test is Complete	✓

- **Test solution:** Reserpine solution 0.167 pmol/µL
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s (both MS and MS/MS)
- **Scan mode:** Product Ion (MS2)
- **Product Of:** 609.3 (or as calibrated)
- **Product Ion:** 195.1
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.

Guideline	**Result**
Transmission efficiency $\frac{Intensity\ for\ ion\ at\ m/z\ 195.1}{Intensity\ for\ ion\ at\ m/z\ 609.3\ (or\ as\ calibrated)} \times 100 \geq 10\%$	6.6%

Planned Maintenance

Mass Spectrometer Maintenance

Task	Complete	N/A
Shut down the system and then disconnect the mains supply power cable.	✓	—
If required, replace the roughing pump oil. The recommended interval is every 3 years. **Note:** If an oil change is not required, then inspect the oil level and top up, if necessary. **CAUTION: Potential System Damage. Do not mix different types of oil. Mixing mineral oil with synthetic oil can cause pump failure.**	✓	—
If required, replace the roughing pump oil exhaust filter. The recommended interval is every 3 years.	◉	○
Confirm that there is no excessive roughing pump oil leakage. Clean up any oil.		—
Make sure that the roughing pump exhaust is properly routed to the ventilation system.	✓	—

Planned Maintenance Tasks

Task	Complete	N/A
Inspect the exhaust system: • Make sure that all of the gas fittings at the rear bulkhead are tight. • Make sure that all of the exhaust hoses are free of kinks. • Make sure that all of the hoses at the waste bottle are secure, and there are no signs of leaks. • Make sure that the waste bottle is in an upright position. • Make sure that the exhaust hose is secured to the lab ventilation system. • Confirm that no liquid is trapped in the exhaust lines.	✓	—
Clean or replace the four air filters in the base of the mass spectrometer chassis.	✓	—
(If applicable) Clean the turbo pump filter screen.	○	◉
(If applicable) Verify the operation of the SCIEX-supplied bench cooling fans.	◉	○
Clean the curtain plate.	✓	—
Clean the orifice plate.	✓	—
Clean the QJet® Ion Guide and IQ0 lens.	✓	—
(If contamination is detected) Clean the Q0 region and the IQ1 lens.	◉	○
Inspect the cable connections: • Make sure that the power cables for the mass spectrometer, LC system, roughing pump, syringe pump, gas generator, and UPS are securely connected. • Make sure that the communications cables for the GPIB/Ethernet ports, LC connections, and roughing pump are securely connected.	✓	—

Task	Complete	N/A
Verify system support functions — gas: • Confirm the input gas pressures at the regulators are within specifications. • Confirm that there is no liquid present in the gas lines.	✓	—
Verify the expiry date on the battery system for the UPS (sold by SCIEX), and then recommend replacement of the battery tray, if required.	○	◒
Start up the system.	✓	—

Turbo V™ Ion Source Maintenance

Task	Complete	N/A
If necessary, replace the electrode in the TurboIonSpray® and APCI Probes.	◒	○
With the TurboIonSpray® probe installed, verify that the temperature (TEM) reaches the recommended set point of 500 °C.	✓	—
(If applicable) With the APCI probe installed, verify that the temperature (TEM) reaches the recommended set point of 400 °C.	○	◒
Inspect the ion source and, if visible signs of contamination are present, clean the inner surfaces using lint-free wipes and a 50:50 methanol:water solution. **Note:** Remove the corona discharge needle before cleaning.	◒	○

Software Maintenance

Note: This task is not applicable to MD systems.

Task	Complete	N/A
(Obtain customer approval first) Install any applicable Analyst® Software HotFixes. **Note:** Make sure that the compatible instrument firmware is installed.	○	◉

Post-Planned Maintenance

Voltage Tests

Task		Complete
Inspect the RF tuning voltages at the QPS amplifier module and then, if required, tune the coil boxes.		✓
Inspect the detector voltage. Optimize, if required.		✓
Detector voltage	2100	

Post-PM Pressure Test

Post-PM Pressure Test is Complete	✓

Test	Specification	Result
Vacuum chamber pressure with CAD gas off	0.4×10^{-5} torr $\leq P_{CAD\ 0} \leq 1.1 \times 10^{-5}$ torr	0.8e-5
Pressure difference (CAD_{12} minus CAD_0)	1.8×10^{-5} torr $\leq (P_{CAD\ 12} - P_{CAD\ 0}) \leq 2.8 \times 10^{-5}$ torr	2.5e-5

Inspect for Contamination

Task	Complete	N/A
Inspect for front-end contamination. Refer to Inspect for Contamination.	✓	—

Post-PM System Tests

Q1 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
175.133	≥ 8.0×10^6	2.1e7	0.6 to 0.8	0.73
500.380	≥ 8.0×10^6	2.8e7	0.6 to 0.8	0.70
906.673	≥ 2.0×10^7	3.8e7	0.6 to 0.8	0.73
1,952.427	≥ 8.8×10^5	6.0e6	0.6 to 0.8	0.69

Q1 Positive MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q3 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
175.133	≥ 8.0×10^6	2.8e7	0.6 to 0.8	0.73
500.380	≥ 8.0×10^6	3.1e7	0.6 to 0.8	0.70
906.673	≥ 2.0×10^7	4.6e7	0.6 to 0.8	0.69
1,952.427	≥ 8.8×10^5	5.5e6	0.6 to 0.8	0.69

Q3 Positive MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q1 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
933.636	≥ 1.8×10^7	2.6e7	0.6 to 0.8	0.70
1,863.306	≥ 1.4×10^6	4.3e6	0.6 to 0.8	0.71

Q1 Negative MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q3 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
933.636	≥ 1.8×10^7	3.4e7	0.6 to 0.8	0.77
1,863.306	≥ 2.0×10^6	5.6e6	0.6 to 0.8	0.72

Q3 Negative MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Reserpine MS/MS Transmission Test is Complete	✓

- **Test solution:** Reserpine solution 0.167 pmol/µL
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s (both MS and MS/MS)
- **Scan mode:** Product Ion (MS2)
- **Product Of:** 609.3 (or as calibrated)
- **Product Ion:** 195.1
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.

Specification	**Result**
Transmission efficiency $\frac{Intensity\ for\ ion\ at\ m/z\ 195.1}{Intensity\ for\ ion\ at\ m/z\ 609.3\ (or\ as\ calibrated)} \times 100 \geq 10\%$	11%

Post-PM Tasks

Task	Complete	N/A
Delete any unnecessary files.	✓	—
Back up the Analyst Data folder.	✓	—
(If applicable) Defragment the hard drive.	○	◉
(Not applicable for MD instrument families) If the customer has a Software Support Plan, then perform the Software Health Check: • (Obtain customer approval first) Install any compatible HotFixes and updates for SCIEX add-on software.	○	◉

StatusScope® Remote Monitoring Service Tasks

The StatusScope® Remote Monitoring Service is not applicable for MD systems.

Planned Maintenance Tasks

Task	Complete	N/A
Note: Installation of the StatusScope® Remote Monitoring Service is available only to warranty and eligible contract customers. Refer to sciex.com/instrument-service-and-support/statusscope-remote-monitoring for a list of eligible contracts. If the StatusScope® Remote Monitoring Service is not installed, then perform these tasks: • If the customer does not want the StatusScope® Remote Monitoring Service installed, then skip the remaining steps in this section. • If the customer wants the StatusScope® Remote Monitoring Service installed, then complete the steps in this section.	○	◒
Verify the connection to the server for the StatusScope® Remote Monitoring Service. **Note:** Use the **StatusScopePortCheck.exe**. The utility is included with the StatusScope® installer.	○	◒
Install the agent for the StatusScope® Remote Monitoring Service.	○	◒
Ask the customer to log on to SCIEX Now™ to verify that the instrument is connected to the server for the StatusScope® Remote Monitoring Service. **Note:** The instrument is shown under the account of the Primary Contact.	○	◒

Wrap-up

Task	Complete	N/A
Review the work performed with the customer.	✓	—
Record the test results in this document and then attach all of the test data.	✓	—
Review the routine maintenance schedule and the procedures with the customer.	✓	—
Complete this document: • Review the test results with the customer. • Provide the customer with the completed document and the test data. • If an electronic copy of the document is supplied to the customer, then save a copy on the Service drive.	✓	—

Signoff 3

Organization	Pace South Carolina		
Mass spectrometer serial number	EB250231807	Service request number	5030888
FSE name	Lynne Russell	Date (yyyy-mm-dd)	2021-03-25
FSE signature			

Comments and Exceptions

Unable to check RAID and perform vacuum system test because I did not have admin privileges on the customer computer. LER 25MAR2021

Inspect for Contamination A

Perform a Q1 and Q3 charging test to determine whether front end contamination is present.

1. Run the **Pos PPG** method for 10 minutes, monitoring the Total Ion Count (TIC) for degradation of the signal or a decrease in sensitivity.
2. Change the polarity to Negative, and then scan for one minute.
3. Change the polarity to Positive, and then make sure that the **IS** parameter returns to the original value.
4. Run the method.

   If the signal sensitivity is restored temporarily but the Total Ion Count (TIC) again degrades by more than 5% over a 10 minute run, then a possible front-end contamination is indicated.
5. Repeat the test in Negative polarity using the Q1 Neg PPG method.

Guidelines for Cleaning the Front End

If charging tests indicate that cleaning is necessary, then clean the front-end components, including the QJet® Ion Guide, IQ0 lens, Q0 quadrupole, and IQ1 lens.

Removing the ion optics is considered a repair activity. FSEs must open a separate service repair call.

Note: This procedure does not provide troubleshooting for all technical root causes of signal degradation or charging effect. Signal degradation might also result from a contaminated TurboIonSpray® Probe or electrode, method parameters that are not optimized, or other factors.

Extract Dilution Preparations

537	**1X**	**5X**	**10X**	**20X**	**50X**	**100X**	**200X**	**500X**	**1000X**	**2000X**
EXTRACT (uL)	950	200	100	50	20	10	20	8	4	2
IS (uL)	50	40	45	47.5	49	49.5	199	199.6	199.8	199.9
96% MeOH (uL)	-	760	855	902.5	931	940.5	3781	3792.4	3796.2	3798.1
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/Vol	1/(Vol*0.2)	1/(Vol*0.1)	1/(Vol*0.05)	1/(Vol*0.02)	1/(Vol*0.01)	1/(Vol*0.005)	1/(Vol*0.002)	1/(Vol*0.001)	1/(Vol*0.0005)
ID Aq	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	(1/0.91)* (FV/V_o)	5* (FV/V_o)	10* (FV/V_o)	20* (FV/V_o)	50* (FV/V_o)	100* (FV/V_o)	200* (FV/V_o)	500* (FV/V_o)	1000* (FV/V_o)	2000* (FV/V_o)
DAI	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
SAMPLE (uL)	700	140	70	35	14	7	14	5.6	2.8	1.4
SUR (uL)	25	25	25	25	25	25	100	100	100	100
MeOH (uL)	275	275	275	275	275	275	1100	1100	1100	1100
Water (uL)	0	560	630	665	686	693	2786	2794.4	2797.2	2798.6
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/.7	1/.14	1/.07	1/.035	1/.014	1/.007	4/.014	4/.0056	4/.0028	4/.0014
ID Solid	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	((V_E/(M*S))/ 0.91)/1000	((V_E/(M*S))/ 0.2)/1000	((V_E/(M*S))/ 0.1)/1000	((V_E/(M*S))/ 0.05)/1000	((V_E/(M*S))/ 0.02)/1000	((V_E/(M*S))/ 0.01)/1000	((V_E/(M*S))/ 0.005)/1000	((V_E/ (M*S))/ 0.002)/1000	((V_E/ (M*S))/ 0.001)/1000	((V_E/ (M*S))/ 0.0005)/1000

NOTE: Dilutions of 100x or below will be prepped in 1-mL FV; dilutions higher than 100x and will be prepped in 4-mL FV.

Analyst: ARC2 **Level 2 Analyst:** NA

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1745

Prep Batch: 10113

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/27/2021 1332
End Date: 07/27/2021 1639

Conc Analyst: ARC2
Conc Start Date: 07/27/2021 1639
Conc End Date: 07/27/2021 1639

Surrogate: SVLC-1581
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH>96%/MECH/4%/H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ10113-001	MB		1	PFAS by ID SOP QSMB-15	280	30	250		0.000	10.0	MB init:278.40g,fin:30.38g;LCS init:275.50g,fin:29.86g;
WQ10113-002	LCS		1	PFAS by ID SOP QSMB-15	280	30	250	SVLC-1575	0.200	10.0	Sorbent dry start/end:1514/1519;Buffer:SV21-584;Amm-MeOH:SV21-585(4mL);QC Water:21-1503;
WG20004-013	Sample	ACRC5-14039A-071421	1	PFAS by ID SOP QSMB-15	290.74	32.15	259		0.000	10.0	Bottletop#329;Pipettes:20-2535,383;QC Bottles: M-1-172-04BB;XL-AW:21-1522;Reservoirs:21-998;
WG20004-014	Sample	ACRC3-W7-9-071421	1	PFAS by ID SOP QSMB-15	270	32.68	237		0.000	10.0	Filter cartridges:21-1634;Elution tubes:21-1455;Falcon tubes:21-582;Centrifuge tubes:20-2814;Storage bottles:21-1346;
WG20004-015	Sample	ACRC5-WNB-14-071421	1	PFAS by ID SOP QSMB-15	298.04	32.68	265		0.000	10.0	MeOH Ext:4mL,Filt:2mL;IS:SVLC-1569(0.010mL); ASV/Caps: 21-714/21-715;
WG20004-016	Sample	FB-06-071421	1	PFAS by ID SOP QSMB-15	305.21	31.87	273		0.000	10.0	
WG20004-017	Sample	ACRC1,7-WU4-9-071521	1	PFAS by ID SOP QSMB-15	310.13	32.07	278		0.000	10.0	
WG20004-018	Sample	ACRC1,7-PZA1-5C-071521	1	PFAS by ID SOP QSMB-15	305.11	32.31	273		0.000	10.0	
WG20004-018MS	MS		1	PFAS by ID SOP QSMB-15	305.1	31.96	273	SVLC-1575	0.200	10.0	Stacked cartridge test 21-1636 blank init:286.52g,fin:32.16g;
WG20004-018MD	MSD		1	PFAS by ID SOP QSMB-15	299.79	32.29	268	SVLC-1575	0.200	10.0	Stacked cartridge test 21-1636 LCS init:284.54g,fin:32.29g;

(end of report) **Total Samples: 6**

Analyst: ALM **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1746

Prep Batch: 10188

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/27/2021 1619
End Date: 07/27/2021 2229

Conc Analyst: ALM
Conc Start Date: 07/27/2021 0000
Conc End Date: 07/27/2021 0000

Surrogate: SVLC-1581
Surrogate Vol. (mL): 0.110

Ext Solvent: MEOH>96%/MEOH/4%/H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ10188-001	MB		1	PFAS by ID SOP QSMB-15	250		250		0.000	10.0	Init: 293.75g; Final: 33.28g
WQ10188-002	LCS		1	PFAS by ID SOP QSMB-15	250		250	SVLC-1575	0.200	10.0	Init: 290.76g; Final: 33.00g
WG27016-001	Sample	AFFF21-GAC-01-072621-00	1	PFAS by ID SOP QSMB-15	305.29	33.74	272		0.000	10.0	Sorbent dry start/end: 1st: 1805/1810,2nd: 2145/2150;Buf 584;Amm>MeOH:SV21-593(4mL);QC Water:21-1503;
WG20004-019	Sample	FB-07-071521	1	PFAS by ID SOP QSMB-15	285.31	31.92	253		0.000	10.0	Bottletop#329;Pipettes:20-2535,20-1288;QC Bottles: M-1-172-04BB;XL-AW.21-1522;Reservoirs:21-998;
WG20004-020	Sample	ACPC5-14D12A-071621	1	PFAS by ID SOP QSMB-15	303.33	32.23	271		0.000	10.0	Filter cartridges:21-1634;Elution tubes:21-1455;Falcon tubes:21-582;Centrifuge tubes:20-2814
WG20004-021	Sample	ACPC5-14D12A-071621-FD	1	PFAS by ID SOP QSMB-15	299.13	32.86	266		0.000	10.0	MeOH Ext:4mL,Filt:2mL;IS:SVLC-1576(0.010mL); ASV/Caps: 21-714/21-715;Storage bottles:20-2633/21-1346;
WG20004-022	Sample	ACPC3-WI9-2-071621	1	PFAS by ID SOP QSMB-15	327.41	31.92	295		0.000	10.0	
WG20004-023	Sample	ACPC3-WI7-10-071621	1	PFAS by ID SOP QSMB-15	324.81	32.46	292		0.000	10.0	
WG20004-024	Sample	ACPC24-171A-071621	1	PFAS by ID SOP QSMB-15	297.46	32.21	265		0.000	10.0	
WG20004-024MSMS			1	PFAS by ID SOP QSMB-15	297.12	31.9	265	SVLC-1575	0.200	10.0	
WG20004-025	Sample	FB-08-071621	1	PFAS by ID SOP QSMB-15	301.48	32.32	269		0.000	10.0	
WG20004-026	Sample	FB-07-071621	1	PFAS by ID SOP QSMB-15	291.93	32.42	260		0.000	10.0	
WG27017-001	Sample	AFFF21-FRB-01-072621-00	1	PFAS by ID SOP QSMB-15	298.32	33.59	265		0.000	10.0	
WG27017-002	Sample	AFFF21-ICE-01-072621-01	1	PFAS by ID SOP QSMB-15	215.23	33.15	182		0.000	10.0	NCM56610

Analyst: ALM **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1746

Prep Batch: 10188

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/27/2021 1619
End Date: 07/27/2021 2229

Conc Analyst: ALM
Conc Start Date: 07/27/2021 0000
Conc End Date: 07/27/2021 0000

Surrogate: SVLC-1581
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH>96%/MECH/4%/H2O

Reagents Vol. (mL): 10

Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WG22011-001	Sample	ACRC24-W89-1-071921	1	PFAS by ID SOP QSMB-15	306.62	32.64	274		0.000	10.0	
WG22011-002	Sample	ACRC3-W7-3-071921	1	PFAS by ID SOP QSMB-15	305.64	32.42	273		0.000	10.0	
WG22011-003	Sample	ACRC3-W7-3-071921-FD	1	PFAS by ID SOP QSMB-15	316.86	32.59	284		0.000	10.0	
WG22011-004	Sample	ACRC3-W7-11-071921	1	PFAS by ID SOP QSMB-15	285.55	31.86	254		0.000	10.0	NCM56611
WG22011-005	Sample	ACRC03-W7-13-071921	1	PFAS by ID SOP QSMB-15	317.07	32.2	285		0.000	10.0	
WG22011-006	Sample	ACRC03-UST-MW-02-071921	1	PFAS by ID SOP QSMB-15	292.64	32.47	260		0.000	10.0	
WG22011-007	Sample	ACRC21-W4-14-071921	1	PFAS by ID SOP QSMB-15	298.38	32.89	265		0.000	10.0	
WG22011-007DUP	Duplicate		1	PFAS by ID SOP QSMB-15	285.07	32.28	253		0.000	10.0	
WG22011-008	Sample	ACRC21-W6-6-071921	1	PFAS by ID SOP QSMB-15	291.72	32.55	259		0.000	10.0	
WG22011-009	Sample	FB-09-071921	1	PFAS by ID SOP QSMB-15	229.83	33.04	197		0.000	10.0	NCM56610

(end of report) **Total Samples: 20**

Analyst: ALM **Level 2 Analyst:** NA

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1747

Prep Batch: 10648

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/30/2021 1838
End Date: 07/30/2021 2316

Conc Analyst: ALM
Conc Start Date: 07/30/2021 0000
Conc End Date: 07/30/2021 0000

Surrogate: SVLC-1584
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH-96%MECH/4%H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ10648-001	MB		1	PFAS by ID SOP QSMB-15	250		250		0.000	10.0	Init: 287.76g; Final: 32.79g; NOM56830, 56831
WQ10648-002	LCS		1	PFAS by ID SOP QSMB-15	250		250	SVLC-1583	0.200	10.0	Init: 287.32g; Final: 33.34g
WG30006-008	Sample	AFFF21-GW03-23-072921-00-T4	1	PFAS by ID SOP QSMB-15	276.86	32.78	244		0.000	10.0	Sorbent dry start/end:2159/2204;Buffer:SV21-584;Amm-MeOH:SV21-593(4mL);QC Water:21-1503;
WG30006-009	Sample	AFFF21-GW03-15-072921-00-T4	1	PFAS by ID SOP QSMB-15	294.95	33.48	261		0.000	10.0	Bottletop#329;Pipettes:20-2535,393,21-1600;QC Bottles: M-1-172-04BB;XL-AW.21-1522;Reservoirs:21-998;
WG29009-001	Sample	AFFF01-SW01-072821-00-T2	1	PFAS by ID SOP QSMB-15	321.54	45.49	276		0.000	10.0	Filter cartridges:21-1519;Falcon tubes:21-582;Centrifuge tubes:20-2814;Storage bottles:20-2633;
WG29009-001	MS	MS	1	PFAS by ID SOP QSMB-15	314.47	45.88	269	SVLC-1583	0.200	10.0	MeOH Ext:4mL,Filt:2mL;IS:SVLC-1576(0.010mL); ASV/Caps: 21-714/21-715;
WG29009-001	MD	MSD	1	PFAS by ID SOP QSMB-15	308.54	45.71	263	SVLC-1583	0.200	10.0	
WG29009-009	Sample	AFFF01-RB-072821-01-T1	1	PFAS by ID SOP QSMB-15	270.43	32.03	238		0.000	10.0	
WG20004-020	Sample	ACFC5-14D12A-071621	2	PFAS by ID SOP QSMB-15	319.07	32.59	286		0.000	10.0	
WG20004-021	Sample	ACFC5-14D12A-071621-FD	2	PFAS by ID SOP QSMB-15	315.43	32.96	282		0.000	10.0	
WG22011-001	Sample	ACFC24-W89-1-071921	2	PFAS by ID SOP QSMB-15	294.56	32.35	262		0.000	10.0	
WG22011-002	Sample	ACFC3-W7-3-071921	2	PFAS by ID SOP QSMB-15	315.62	32.26	283		0.000	10.0	

(end of report) **Total Samples: 8**

Analyst: ALM **Level 2 Analyst:** NA

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1745

Prep Batch: 10799

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 08/02/2021 1842
End Date: 08/02/2021 2252

Conc Analyst: ALM
Conc Start Date: 08/02/2021 0000
Conc End Date: 08/02/2021 0000

Surrogate: SVLC-1589
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH+96%MECH/4%H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ10799-001	MB		1	PFAS by ID SOP QSMB-15	250		250		0.000	10.0	Init: 281.09g; Final: 32.30g
WQ10799-002	LCS		1	PFAS by ID SOP QSMB-15	250		250	SVLC-1583	0.200	10.0	Init: 285.19g; Final: 33.09g
WQ10799-003	LCSD		1	PFAS by ID SOP QSMB-15	250		250	SVLC-1583	0.200	10.0	Init: 289.06g; Final: 31.32g
WG20004-014	Sample	ACRC3-W7-9-071421	2	PFAS by ID SOP QSMB-15	272.24	31.95	240		0.000	10.0	Sorbent dry start/end:2145/2150;Amm-MeOH:SV21-604(4mL);QC Water:21-1503;
WG31020-010	Sample	AFFF01-FRB-02-073021-T1	1	PFAS by ID SOP QSMB-15	268.78	31.71	237		0.000	10.0	Bottletop#329;Pipettes:20-2535,383;QC Bottles: M-1-172-04BB;XL-AW:21-1522;Reservoirs:21-687;
WG31020-015	Sample	AFFF01-FRB-01-073021-T2	1	PFAS by ID SOP QSMB-15	261.02	32.37	229		0.000	10.0	Filter cartridges:21-1520;Elution tubes:21-1455;Storage bottles:21-1346;
WG28008-006	Sample	ASTC-DECON-(072721)	1	PFAS by ID SOP QSMB-15	314.71	32.9	282		0.000	10.0	MeOH Ext:4mL,Filt:2mL;IS:SVLC-1576(0.010mL); ASV/Caps: 21-714/21-715;
WG29004-001	Sample	FTKX-FB-1-072721	1	PFAS by ID SOP QSMB-15	269.03	32.7	236		0.000	10.0	
WG29004-002	Sample	FTKX-EB-1-072721	1	PFAS by ID SOP QSMB-15	271.41	33.49	238		0.000	10.0	
WG29004-007	Sample	FTKX-FD-1-SW-072721	1	PFAS by ID SOP QSMB-15	288.57	33.15	255		0.000	10.0	

(end of report) **Total Samples: 7**

Analyst: ALM **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1744

Prep Batch: 99902

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/23/2021 1742
End Date: 07/23/2021 2321

Conc Analyst: ALM
Conc Start Date: 07/23/2021 0000
Conc End Date: 07/23/2021 0000

Surrogate: SVLC-1579
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH+96%MECH/4%H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ99902-001	MB		1	PFAS by ID SOP QSMB-15	250		250		0.000	10.0	Init: 294.18g; Final: 32.99g
WQ99902-002	LCS		1	PFAS by ID SOP QSMB-15	250		250	SVLC-1575	0.200	10.0	Init: 290.08g; Final: 31.15g
WG16047-007	Sample	CU2-RCVTW-071621	3	PFAS by ID SOP QSMB-15	295.59	32.49	263		0.000	10.0	Sorbent dry start/end:1st:2048/2053,2nd:2235/2240;Buf 584;Amm-MeOH:SV21-585(4mL);QC Water:21-1503;
WG20002-029	Sample	ERB-071321-S	1	PFAS by ID SOP QSMB-15	285.15	32.43	253		0.000	10.0	Bottletop#329;Pipettes:20-2535,383;QC Bottles: M-1-172-04BB;XL-AW:21-1522;Reservoirs:21-998;
WG20004-001	Sample	ACRC18-11E02A-071221	1	PFAS by ID SOP QSMB-15	318.1	32.37	286		0.000	10.0	Filter cartridges:21-1634;Elution tubes:21-1455;Falcon tubes:21-582;Centrifuge tubes:20-2814;Storage bottles:21-1346;
WG20004-001MS	MS		1	PFAS by ID SOP QSMB-15	304.91	32.31	273	SVLC-1575	0.200	10.0	MeOH Ext:4mL,Filt:2mL;IS:SVLC-1569(0.010mL); ASV/Caps: 21-714/21-715;
WG20004-002	Sample	ACRC18-WNB-7-071221	1	PFAS by ID SOP QSMB-15	291.14	32.28	259		0.000	10.0	
WG20004-002DU	Duplicate		1	PFAS by ID SOP QSMB-15	298.85	32.45	266		0.000	10.0	
WG20004-003	Sample	ACRC1-11N21A1-071221	1	PFAS by ID SOP QSMB-15	308.11	32.1	276		0.000	10.0	
WG20004-004	Sample	ACRC8-WI1-2-071221	1	PFAS by ID SOP QSMB-15	270.7	31.85	239		0.000	10.0	NCM56466
WG20004-005	Sample	ACRC6-WV4-18-071221	1	PFAS by ID SOP QSMB-15	301.3	32.4	269		0.000	10.0	
WG20004-006	Sample	FB04-071221	1	PFAS by ID SOP QSMB-15	320.03	32.16	288		0.000	10.0	
WG20004-007	Sample	ACRC25-15H12A-071321	1	PFAS by ID SOP QSMB-15	272.83	32.53	240		0.000	10.0	
WG20004-008	Sample	ACRC25-15B10A-071321	1	PFAS by ID SOP QSMB-15	308.54	31.97	277		0.000	10.0	

Analyst: ALM **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1744

Prep Batch: 99902

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/23/2021 1742

End Date: 07/23/2021 2321

Conc Analyst: ALM

Conc Start Date: 07/23/2021 0000

Conc End Date: 07/23/2021 0000

Surrogate: SVLC-1579

Surrogate Vol. (mL): 0.110

Ext Solvent: MECH-96%/MECH/4%/H2O

Reagents Vol. (mL): 10

Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WG20004-009	Sample	ACRC24-64A-071321	1	PFAS by ID SOP QSMB-15	292.61	31.95	261		0.000	10.0	
WG20004-010	Sample	ACRC24-WU4-1-071321	1	PFAS by ID SOP QSMB-15	258.85	32.28	227		0.000	10.0	
WG20004-011	Sample	FB-05-071321	1	PFAS by ID SOP QSMB-15	307.15	32.24	275		0.000	10.0	
WG20004-012	Sample	ACRC5-WU4-19-071421	1	PFAS by ID SOP QSMB-15	323.9	32.6	291		0.000	10.0	

(end of report) **Total Samples: 14**

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072521-DOD.b\072521007.d		
Injection Date:	25-Jul-2021 12:44:01	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.721	1.721	0	866805	19	>100:1			1001.00	934.23	96.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.727		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.089	2.099	0	914465	16	>100:1			1001.00	947.45	99.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.099		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.151	0	269161	15	>100:1			1001.00	946.34	94.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.151		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.511		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.424	2.433	0	175270	17	>100:1			5005.00	3817.63	98.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.441		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.467	2.476	0	751311	18	>100:1			1001.00	887.63	95.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.476		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.586	2.594	0	842854	18	>100:1			5005.00	5934.00	93.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.594		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.853	2.862	0	772610	18	>100:1			1001.00	870.24	90.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.862		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.871	2.880	0	244137	18	>100:1			1001.00	971.77	97.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.880		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.898		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.259		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.220	3.227	0	159700	23	>100:1			5005.00	4306.43	91.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.220		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.246	3.252	0	811578	21	>100:1			1001.00	950.22	102.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.259		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.620	3.628	0	208780	25	>100:1			1001.00	978.24	96.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.628		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.836		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.975		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.265		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.423		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.763		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.628	3.635	0	829225	20	>100:1			1001.00	936.89	97.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.635		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.896	3.904	0	432309	17	>100:1			1001.00	1078.27	97.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.904		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.967	3.975	0	150620	18	>100:1			5005.00	5274.57	88.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.967		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.555		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.967	3.975	0	722132	19	>100:1			1001.00	1004.66	96.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.975		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.120	4.136	0	968450	17	>100:1			5005.00	5409.23	97.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.136		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.274	4.284	0	715518	16	>100:1			1001.00	1063.95	96.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.284		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.284	4.284	0	936399	15	>100:1			5005.00	5782.26	103	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.293		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.311	4.302	1	181482	14	>100:1			1001.00	1209.33	102.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.312		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.330	4.321	1	57741	15	>100:1			1001.00	970.79	84.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.330		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.547	4.555	0	688965	18	>100:1			1001.00	950.17	91.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.555		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.791		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.465	4.465	0	175371	16	>100:1			1001.00	1223.28	98	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.473		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.490	4.490	0	58076	18	>100:1			1001.00	1011.01	96.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.498		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.001	5.014	0	853944	19	>100:1			1001.00	1079.82	93.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		5.014		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.398	5.416	-1	577341	18	>100:1			1001.00	1417.65	100.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.398	5.416	-1/0	9424	18	42:1	Target = 13.88		10.163	10.163		
813 > 269	40	5.398	5.416		729	21	35:1	12.92 (6.94-20.83)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.816		ND								
*** 37 13C2_PFDA**													
515 > 470		3.975	3.985	0	822707	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.467	2.476	0	870289	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.246	3.259	0	972534	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.721	1.727	0	1000602	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.620	3.628	0	256151	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072621-DOD.b\072621007.d		
Injection Date:	26-Jul-2021 12:15:44	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Reagent:	Istds	Conc. Level: Smp	Vol. Added: 0.0100 ml
Reagent:	Surrogates	Conc. Level: Smp	Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.719	1.719	0	965910	20	>100:1			1001.00	1041.04	98.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.719		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.087	2.088	0	959526	17	>100:1			1001.00	994.14	94.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.140	0	297682	15	>100:1			1001.00	1046.61	102.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.140		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.493		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.423	2.415	1	210458	18	>100:1			5005.00	4584.08	87.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.415		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.458	2.459	0	880964	17	>100:1			1001.00	1040.81	101.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.459		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.579	2.579	0	748837	18	>100:1			5005.00	5272.08	102.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.579	2.579	0/0	1132	11	3.8:1	Target = 0.79		9.4523	9.4523		
285 > 185	66	2.586	2.579		1922	19	5.4:1	0.58 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.845	2.847	0	929361	17	>100:1			1001.00	1046.79	98.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.847		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.863	2.864	0	260762	18	>100:1			1001.00	1037.94	95.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.864		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.882		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.243		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.204	3.205	0	207033	29	>100:1			5005.00	5582.79	94.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.211		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.229	3.230	0	900586	22	>100:1			1001.00	1054.44	101.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.237		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.604	3.598	1	207160	20	>100:1			1001.00	970.65	90	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.598		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.810		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.938		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.233		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.390		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.731		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.604	3.606	0	922911	20	>100:1			1001.00	1042.74	101	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.613		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.888	3.884	1	456715	19	>100:1			1001.00	1139.14	102	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.884		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.942	3.946	0	184725	19	>100:1			5005.00	6468.90	101.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.954		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.529		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.950	3.946	1	751249	18	>100:1			1001.00	1045.17	91.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.946		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.095	4.100	0	997643	17	>100:1			5005.00	5572.28	96.1	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.108		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.256	4.252	1	733407	15	>100:1			1001.00	1090.55	94.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.252		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.256	4.252	1	883090	16	>100:1			5005.00	5453.08	94.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.262		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.302	4.290	1	165246	15	>100:1			1001.00	1101.14	123.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.308		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.321	4.318	1	65249	14	>100:1			1001.00	1097.02	94.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.327		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.515	4.521	0	778542	17	>100:1			1001.00	1073.71	98.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.521		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.762		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.457	4.455	1	154345	18	>100:1			1001.00	1076.62	100.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.472		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.482	4.472	1	58636	18	>100:1			1001.00	1020.76	78.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.480		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.974	4.980	0	735864	17	>100:1			1001.00	930.51	91.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.980		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.360	5.365	0	483096	18	>100:1			1001.00	1186.23	95.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.360	5.373	0/0	8586	14	26:1	Target = 13.88		11.065	11.065		
813 > 269	40	5.360	5.373		681	15	31:1	12.60 (6.94-20.83)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.744		ND								
*** 37 13C2_PFDA**													
515 > 470		3.950	3.946	1	757074	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.458	2.467	0	773226	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.229	3.237	0	855933	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.719	1.719	0	911522	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.597	3.606	0	234768	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072721-DOD.b\072721007.d		
Injection Date:	27-Jul-2021 11:40:41	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.708	1	1044264	20	>100:1			1001.00	1125.49	97.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.714		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.079	2.079	1	1037981	16	>100:1			1001.00	1075.43	97	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.079		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.131	1	308139	15	>100:1			1001.00	1083.38	102.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.131		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.485		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	273087	18	>100:1			5005.00	5948.23	105.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.450	1	905179	18	>100:1			1001.00	1069.42	97	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.450		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.572	2.572	1	712445	19	>100:1			5005.00	5015.87	85.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.572		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.838	2.837	1	938468	18	>100:1			1001.00	1057.05	98.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.837		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.846	1	291721	17	>100:1			1001.00	1161.17	106.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.855		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.872		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.227		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.189	3.189	0	244361	22	>100:1			5005.00	6589.37	102.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.196		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.214	3.215	0	990229	23	>100:1			1001.00	1159.39	101.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.221		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.591	3.592	0	223422	19	>100:1			1001.00	1046.85	91.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.592		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.795		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.922		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.223		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.379		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.718		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.591	3.592	0	953021	21	>100:1			1001.00	1076.76	103.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.606		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.884	3.877	1	484180	19	>100:1			1001.00	1207.64	108.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.877		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.921	3.929	0	196050	19	>100:1			5005.00	6865.49	104.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.914		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.519		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.929	3.929	0	803110	18	>100:1			1001.00	1117.32	98.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.929		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.082	4.091	0	1263940	17	>100:1			5005.00	7059.67	117	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.091		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.232	4.232	0	734350	16	>100:1			1001.00	1091.95	102.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.242		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.241	4.242	0	1033020	17	>100:1			5005.00	6378.90	92.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.251		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.297	4.288	1	157381	20	>100:1			1001.00	1048.73	99.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.298		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.316	4.307	1	62111	16	>100:1			1001.00	1044.26	83.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.316		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.502	4.511	0	751752	16	>100:1			1001.00	1036.76	97.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.502		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.742		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.453	4.453	0	163050	17	>100:1			1001.00	1137.34	111.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.462		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.478	4.470	1	61326	17	>100:1			1001.00	1067.59	99.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.478		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.959	4.960	0	769411	17	>100:1			1001.00	972.93	97.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.960		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.343	5.343	0	474917	17	>100:1			1001.00	1166.15	101.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.343	5.352	0/0	7337	13	26:1	Target = 13.88		9.6184	9.6184		
813 > 269	40	5.334	5.352		795	12	34:1	9.22 (6.94-20.83)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.718		ND								
*** 37 13C2_PFDA**													
515 > 470		3.937	3.937	0	753940	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.450	1	788131	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.214	3.221	0	876853	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.715	1.714	1	980093	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.584	3.592	0	237314	22	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821007.d		
Injection Date:	28-Jul-2021 12:58:02	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.712	1	514911	20	>100:1			1001.00	933.83	94.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.712		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.094	2.088	1	486224	16	>100:1			1001.00	941.68	96.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.146	2.141	1	169243	15	>100:1			1001.00	975.09	94.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.141		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.487		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.416	0	94842	17	>100:1			5005.00	4757.36	100.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.459	2.451	1	558806	17	>100:1			1001.00	926.60	88.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.451		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.574	2.567	1	1168151	18	>100:1			5005.00	5485.03	98.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.575		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.827	0	483025	17	>100:1			1001.00	995.96	100.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.827		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.844	2.846	0	145808	24				1001.00	1049.87	99.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.846		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.864		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.213		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.185	3.187	0	85628	21	>100:1			5005.00	5460.01	103.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.187		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.211	3.213	0	468013	21	>100:1			1001.00	945.93	99.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.207		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.584	0	139485	18	>100:1			1001.00	1001.51	96.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.584		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.796		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.935		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.235		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.396		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.747		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.590	3.592	0	593988	18	>100:1			1001.00	975.04	100.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.592		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.884	3.885	0	303074	17	>100:1			1001.00	1135.20	98.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.885		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.942	3.935	1	81236	19				5005.00	4799.45	88.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.935		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.542		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.942	3.943	0	514081	17	>100:1			1001.00	871.54	84.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.943		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.102	4.105	0	708877	17	>100:1			5005.00	5310.56	103.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.114		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.252	4.255	0	566843	16				1001.00	862.94	91.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.255		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.262	4.255	1	617640	15	>100:1			5005.00	5374.04	96.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.265		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.312	4.306	1	91688	14	>100:1			1001.00	1220.59	111.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.326		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.333	4.336	0	53403	16	>100:1			1001.00	1085.48	109.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.336		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.477	4.479	0	100333	14	>100:1			1001.00	1281.73	109.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.488		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.495	4.497	0	51189	15	>100:1			1001.00	1232.10	111.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.506		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.531	4.533	0	572892	16	>100:1			1001.00	771.65	90.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.533		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.774		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.995	4.991	1	761042	19	>100:1			1001.00	869.74	95.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.991		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.385	5.387	0	912191	17	>100:1			1001.00	1089.73	96.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.385	5.387	0/0	5682	23	26:1	Target = 10.45		10.435	10.435		
813 > 269	40	5.376	5.387		388	19	20:1	14.64 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.766		ND								
*** 37 13C2_PFDA**													
515 > 470		3.942	3.943	0	622792	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.451	1	541240	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.211	3.213	0	488278	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.715	1.712	1	454334	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.584	0	140885	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072821-DOD.b\072821009.d		
Injection Date:	28-Jul-2021 11:52:16	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.721	0	1058899	20	>100:1			1001.00	1141.26	99.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.721		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.079	2.079	0	1022010	15	>100:1			1001.00	1058.88	92.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.079		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.141	0	304499	16	>100:1			1001.00	1070.58	101.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.141		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.494		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.416	0	270727	18	>100:1			5005.00	5896.82	103.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.459	2.459	0	842720	18	>100:1			1001.00	995.62	90.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.459		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.579	2.579	0	712415	19	>100:1			5005.00	5015.66	96.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.579		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.846	2.846	0	853853	17	>100:1			1001.00	961.74	86.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.846		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.864	2.864	0	278739	19	>100:1			1001.00	1109.50	99.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.864		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.890		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.240		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.201	3.208	0	243368	24	>100:1			5005.00	6562.59	97.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.202		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.233	3.233	0	969681	22	>100:1			1001.00	1135.34	99.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.233		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.606	3.606	0	252048	20	>100:1			1001.00	1180.98	107.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.613		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.810		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.937		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.241		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.396		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.736		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.606	3.613	0	938328	19	>100:1			1001.00	1060.16	98.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.613		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.883	3.884	0	525788	17	>100:1			1001.00	1311.42	107.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.884		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.944	3.953	0	204999	19	>100:1			5005.00	7178.87	81.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.945		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.535		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.952	3.953	0	839734	19	>100:1			1001.00	1168.27	100.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.953		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.106	4.106	0	1149632	18	>100:1			5005.00	6421.21	106.2	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.106		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.260	4.260	0	706265	17	>100:1			1001.00	1050.19	91.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.260		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.260	4.260	0	1188326	16	>100:1			5005.00	7337.91	120	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.269		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.297	4.288	1	167121	16	>100:1			1001.00	1113.63	98.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.306		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.315	4.316	0	59283	13	>100:1			1001.00	996.72	84.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.316		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.526	4.535	0	706915	17	>100:1			1001.00	974.92	89.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.526		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.766		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.453	4.446	1	158827	16	>100:1			1001.00	1107.88	118.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.469		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.478	0	65596	22	>100:1			1001.00	1141.92	101.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.478		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.982	4.983	0	715113	18	>100:1			1001.00	904.27	94.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.983		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.377	5.377	0	459063	18	>100:1			1001.00	1127.22	98	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.377	5.386	0/0	6989	16	22:1	Target = 13.88		9.4786	9.4786		
813 > 269	40	5.394	5.386		657	21	18:1	10.63 (6.94-20.83)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.776		ND								
*** 37 13C2_PFDA**													
515 > 470		3.944	3.953	0	770160	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.459	0	783789	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.233	3.233	0	881130	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.715	1.721	0	949053	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.606	3.606	0	230080	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b\072921068.d		
Injection Date:	30-Jul-2021 00:05:50	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	55
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Stephen E. Somerville
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.713	1.712	1	830450	21	>100:1			1001.00	951.09	83.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.719		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.076	1	830265	15	>100:1			1001.00	926.58	84.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.076		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.129	1	266449	15	>100:1			1001.00	953.30	83.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.129		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.484		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.414	2.414	1	175517	17	>100:1			5005.00	4747.65	96.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.414		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.449	2.449	1	741495	19	>100:1			1001.00	933.88	83	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.449		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.571	2.570	1	950057	18	>100:1			5005.00	5277.78	99.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.570		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.836	1	824082	18	>100:1			1001.00	1014.49	89.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.836		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.854	2.853	1	240326	17	>100:1			1001.00	949.17	84.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.853		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.880		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.227		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.196	3.189	1	162993	22	>100:1			5005.00	4788.42	94.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.196		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.221	3.221	1	814296	22	>100:1			1001.00	1010.57	90.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.221		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.594	3.587	1	206421	18	>100:1			1001.00	968.89	89.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.594		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.796		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.923		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.226		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.383		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.720		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.602	3.594	1	784435	20	>100:1			1001.00	914.42	82.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.594		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.885	3.885	1	449779	20	>100:1			1001.00	1045.14	103.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.885		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.931	3.931	1	151009	18	>100:1			5005.00	5245.60	105.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.923		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.522		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.939	3.939	1	672423	18	>100:1			1001.00	910.22	79.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.939		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.093	1	1007139	17	>100:1			5005.00	5195.21	106.4	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.101		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.245	4.245	1	1023868	16	>100:1			5005.00	5832.98	113.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.254		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.245	4.245	1	738411	17	>100:1			1001.00	1052.62	92.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.245		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.301	4.301	1	177278	16	>100:1			1001.00	943.81	91.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.310		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.319	4.319	1	60052	15	>100:1			1001.00	946.20	103.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.319		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.465	4.457	1	177526	18	>100:1			1001.00	1008.19	103.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.473		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.481	1	61006	24	>100:1			1001.00	1009.57	114.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.489		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.514	4.506	1	856828	18	>100:1			1001.00	1149.91	100.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.514		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.751		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.966	4.966	1	816287	17	>100:1			1001.00	1065.13	94.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.966		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.348	5.348	1	507728	18	>100:1			1001.00	1040.01	102.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.357	5.348	1/0	10035	23	31:1	Target = 12.85		13.593	13.593		
813 > 269	40	5.348	5.348		755	16	29:1	13.29 (6.42-19.29)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.723		ND								
*** 37 13C2_PFDA**													
515 > 470		3.947	3.939	1	735918	20	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.458	2.449	1	700041	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.228	3.221	1	794814	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.719	1.712	1	820792	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.594	3.601	0	214158	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\073121-DOD.b\073121007.d		
Injection Date:	31-Jul-2021 13:04:55	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.699	1	609606	21	>100:1			1001.00	1105.57	96.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.705		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.067	1	568132	16	>100:1			1001.00	1100.31	97.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.067		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	1	171331	15	>100:1			1001.00	987.12	94.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.120		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.451		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.389	2.380	1	107904	18	>100:1			5005.00	5412.56	98.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.380		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.425	2.425	1	627508	17	>100:1			1001.00	1040.53	93.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.425		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.541	2.541	1	1220739	17	>100:1			5005.00	5731.95	96.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.541		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.791	2.791	1	535330	18	>100:1			1001.00	1103.81	98.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.800		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.809	2.809	1	152660	17	>100:1			1001.00	1099.21	103.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.800		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.827		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.174		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.140	3.148	0	96584	20	>100:1			5005.00	6158.61	103.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.141		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.167	3.168	0	527786	21	>100:1			1001.00	1066.75	103.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.168		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.545	0	139733	19	>100:1			1001.00	1003.29	94.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.545		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.754		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.880		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.197		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.357		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.701		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.544	3.553	0	649103	19	>100:1			1001.00	1065.51	102.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.553		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.836	3.839	0	284462	17	>100:1			1001.00	1065.48	99.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.839		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.893	3.888	1	111770	17				5005.00	6603.41	103	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.896		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.500		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.893	3.896	0	588720	17	>100:1			1001.00	998.07	95.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.896		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.050	4.054	0	679044	18	>100:1			5005.00	5087.06	106.3	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.063		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.213	4.217	0	614742	16	>100:1			1001.00	935.86	91.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.206		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.213	4.217	0	603087	16	>100:1			5005.00	5247.42	101.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.217		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.274	4.278	0	87606	16	>100:1			1001.00	1166.25	96.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.288		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.294	4.288	1	50301	11	>100:1			1001.00	1022.43	92.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.298		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.437	1	90927	15	>100:1			1001.00	1161.57	95.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.446		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.461	4.464	0	49036	16	>100:1			1001.00	1180.28	94.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.473		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.487	4.491	0	614476	15	>100:1			1001.00	827.66	94.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.482		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.728		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.949	4.951	0	914972	18	>100:1			1001.00	1045.65	96	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.951		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.335	5.339	0	933402	18	>100:1			1001.00	1115.07	103.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.343	5.339	1/1	5340	16	26:1	Target = 10.45		9.5839	9.5839		
813 > 269	40	5.343	5.339		633	17	29:1	8.43 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.712		ND								
*** 37 13C2_PFDA**													
515 > 470		3.893	3.896	0	618812	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.425	2.425	1	578002	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.167	3.168	0	519387	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.699	1.699	1	527602	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.544	3.545	0	135742	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\080321-DOD.b\080321007.d		
Injection Date:	03-Aug-2021 13:17:37	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.698	1	611743	21	>100:1			1001.00	1109.45	96.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.698		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.066	1	563144	15	>100:1			1001.00	1090.65	95.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.066		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.119	1	181147	15	>100:1			1001.00	1043.68	97.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.119		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.451		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.379	1	111520	17	>100:1			5005.00	5593.94	94.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.379		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.425	2.415	1	642249	17	>100:1			1001.00	1064.97	94.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.415		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.541	2.531	1	1241310	17	>100:1			5005.00	5828.54	97.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.531		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.791	2.781	1	512712	18	>100:1			1001.00	1057.17	93.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.790		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.809	2.799	1	147877	18	>100:1			1001.00	1064.77	94.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.799		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.827		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.172		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.147	3.139	1	92382	19	>100:1			5005.00	5890.67	94.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.139		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.167	3.165	1	506643	22	>100:1			1001.00	1024.01	99.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.165		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.535	1	144332	18	>100:1			1001.00	1036.31	100.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.535		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.745		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.885		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.183		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.353		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.698		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.536	3.543	0	655920	20	>100:1			1001.00	1076.71	96.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.543		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.828	3.828	1	308533	17	>100:1			1001.00	1155.64	104	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.836		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.885	3.885	1	95420	17				5005.00	5637.45	98.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.885		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.496		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.894	3.893	1	620723	18	>100:1			1001.00	1052.33	99.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.893		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.043	4.050	0	667092	17	>100:1			5005.00	4997.53	88	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.050		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.204	4.202	1	688211	16				1001.00	1047.70	97.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.213		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.204	4.202	1	680834	16	>100:1			5005.00	5923.89	98.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.213		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.265	4.264	1	88821	15	>100:1			1001.00	1182.42	95.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.274		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.286	4.284	1	52388	13	100:1			1001.00	1064.85	98.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.284		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.435	4.424	1	95752	14				1001.00	1223.21	93.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.442		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.453	4.451	1	46531	15	>100:1			1001.00	1119.98	93.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.460		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.480	4.478	1	624613	16				1001.00	841.31	89.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.478		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.725		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.950	4.949	1	974860	17	>100:1			1001.00	1114.09	99.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.949		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.338	5.335	1	938618	17	>100:1			1001.00	1121.30	98.6	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.343	1/0	5858	17	28:1	Target = 10.45		10.455	10.455		
813 > 269	40	5.338	5.343		466	21	29:1	12.57 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.717		ND								
*** 37 13C2_PFDA**													
515 > 470		3.894	3.893	1	645055	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.425	2.415	1	602307	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.167	3.165	1	523932	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.699	1.698	1	527530	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.536	3.535	1	138830	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\organics\LL\LCMSMS01.i\080321-DOD.b\080321012.d		
Injection Date:	03-Aug-2021 10:26:02	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.715	1	1250230	20	>100:1			1001.00	1431.85	105.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.715		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.079	2.079	1	1182791	16	>100:1			1001.00	1320.01	93.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.079		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.131	1	368874	16	>100:1			1001.00	1319.75	118.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.131		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.485		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.416	0	365522	18	>100:1			5005.00	9887.19	98.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.450	1	1130770	18	>100:1			1001.00	1424.15	105.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.459		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.572	2.572	1	815953	18	>100:1			5005.00	4532.80	116.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.579		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.830	2.838	0	1115735	18	>100:1			1001.00	1373.53	103.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.838		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.839	2.846	0	331537	19	>100:1			1001.00	1309.41	108	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.846		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.873		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.221		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.183	3.195	0	319876	22	>100:1			5005.00	9397.34	107.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.202		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.209	3.221	0	1129172	23	>100:1			1001.00	1401.34	110.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.214		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.579	3.584	0	262019	26	>100:1			1001.00	1229.85	101.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.593	3.584	1/1	1904	30	10:1	Target = 4.05	0.20	6.5752	6.5752		
499 > 99	54	3.601	3.584		494	30	4.5:1	3.85 (2.02-6.07)	2.24				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.788		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.914		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.213		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.379		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.717		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.586	3.591	0	1050156	20	>100:1			1001.00	1224.17	103.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.591		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.862	3.861	1	527624	19	>100:1			1001.00	1226.02	107.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.869		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.931	3.929	1	308593	17	>100:1			5005.00	10720	107.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.929		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.518		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.923	3.937	0	992080	19	>100:1			1001.00	1342.92	100.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.929		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.084	4.090	0	1329647	16	>100:1			5005.00	6858.84	101.9	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.090		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.233	4.241	0	1381455	16	>100:1			5005.00	7870.15	117.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.251		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.233	4.241	0	866289	17	>100:1			1001.00	1234.91	105.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.241		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.280	4.279	1	157567	15	>100:1			1001.00	838.87	106.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.288		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.299	4.297	1	71126	14	>100:1			1001.00	1120.68	83.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.297		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.441	4.439	1	162265	18	>100:1			1001.00	921.52	108.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.453		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.463	4.453	1	64113	16	>100:1			1001.00	1060.99	104.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.469		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.504	4.510	0	845404	17	>100:1			1001.00	1134.58	94	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.510		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.748		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.960	4.968	0	1016639	16	>100:1			1001.00	1326.55	104	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.968		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.352	5.360	0	509407	17	>100:1			1001.00	1043.45	105.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.352	5.360	0/0	7760	14	20:1	Target = 12.85		10.477	10.477		
813 > 269	40	5.360	5.360		572	21	19:1	13.56 (6.42-19.29)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.740		ND								
*** 37 13C2_PFDA**													
515 > 470		3.923	3.929	0	876341	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.450	1	984526	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.215	3.214	1	1026437	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.715	1.715	1	1087225	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.579	3.584	0	245358	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\080421-DOD.b\080421008.d		
Injection Date:	04-Aug-2021 12:49:43	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	98
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.699	1	639493	20	>100:1			1001.00	1159.77	101.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.699		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.067	0	627844	16	>100:1			1001.00	1215.96	105.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.067		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.119	2.120	0	184066	15	>100:1			1001.00	1060.49	96.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.120		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.451		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.380	1	125438	17	>100:1			5005.00	6292.08	110.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.380		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.424	2.424	0	742236	17	>100:1			1001.00	1230.77	106	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.424		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.540	2.531	1	1322093	18	>100:1			5005.00	6207.86	107.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.540		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.790	2.791	0	571229	16	>100:1			1001.00	1177.83	101.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.791		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.808	2.809	0	155142	18	>100:1			1001.00	1117.08	95.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.809		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.836		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.174		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.152	3.141	1	94946	21	>100:1			5005.00	6054.16	100.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.154		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.172	3.168	1	540327	19	>100:1			1001.00	1092.09	103.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.168		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	145214	17	>100:1			1001.00	1042.64	93.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.545		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.747		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.888		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.187		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.357		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.701		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.551	3.545	1	703671	19	>100:1			1001.00	1155.09	103	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.545		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.835	3.831	1	320765	17	>100:1			1001.00	1201.46	95.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.831		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.893	3.888	1	109620	17				5005.00	6476.39	99.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.896		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.500		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.893	3.896	0	620789	18	>100:1			1001.00	1052.44	98.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.896		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.058	4.054	1	836711	17	>100:1			5005.00	6268.23	105	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.063		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.211	4.206	1	672347	15	>100:1			1001.00	1023.55	102.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.206		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.211	4.206	1	729628	16	>100:1			5005.00	6348.44	107.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.227		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.262	4.268	0	91480	15	>100:1			1001.00	1217.82	112.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.278		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.282	4.278	1	54028	13	>100:1			1001.00	1098.18	106.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.288		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.432	4.428	1	113633	16	>100:1			1001.00	1451.64	107.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.446		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.450	4.455	0	48456	15	>100:1			1001.00	1166.32	105.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.464		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.495	4.482	1	626277	16	>100:1			1001.00	843.56	86.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.491		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.728		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.956	4.951	1	1017728	17	>100:1			1001.00	1163.09	99.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.951		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.343	5.347	0	1050225	18	>100:1			1001.00	1254.63	106.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													U
813 > 769	40		5.347		ND								
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.726		ND								
*** 37 13C2_PFDA**													
515 > 470		3.901	3.896	1	646233	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.424	2.424	0	649803	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.172	3.168	1	561876	19	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.704	1.699	1	553737	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	146729	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **D. WILSON** **DATE:** **SEPTEMBER 20, 2021**

FROM: **MICHELLE L. WOEBER** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – POLY- AND PERFLUOROALKYL SUBSTANCES**
NASA-AMES
SAMPLE DELIVERY GROUP (SDG) WG22011

SAMPLES: 21/Aqueous/PFAS

AOPC03-UST-MW-02-071921	AOPC03-W7-13-071921	AOPC10-WGC2-1-072121
AOPC10-WGC2-10-072121	AOPC10-WGC2-13-072121	AOPC10-WGC2-8-072121
AOPC17,21-WU5-12-072021	AOPC21-W4-14-071921	AOPC21-W4-6-072021
AOPC21-W6-5-072021	AOPC21-W6-6-071921	AOPC21-WU5-10-072021
AOPC24-W89-1-071921	AOPC3-W7-11-071921	AOPC3-W7-3-071921
AOPC3-W7-3-071921-FD	AOPC9-W2-13-072021	FB-09-071921
FB-10-072021	FB-11-072121	SWB-01-072021

Overview

The sample set for NASA-Ames, SDG WG22011, consisted of seventeen (17) aqueous environmental samples, three (3) field blanks, and one (1) source water blank. All twenty-one (21) samples were analyzed for poly-and perfluoroalkyl substances (PFAS). One field duplicate pair was associated with this SDG: AOPC3-W7-3-071921/AOPC3-W7-3-071921-FD.

The samples were collected by Tetra Tech, Inc. on July 19-21, 2021 and analyzed by Pace Analytical Services. All analyses were conducted in accordance with Department of Defense ((DOD)/Department of Energy (DOE) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3, PFAS using LC/MS/MS Appendix B Table B-15 (2019). The data contained in this SDG was validated via EPA Stage 4 with regard to the following parameters:

*	• Data completeness
*	• Hold times/Sample Preservation
*	• Mass Calibration
*	• LC/MS/MS System Tuning and Performance
*	• Mass Spectral Acquisition Rate
*	• Instrument Sensitivity Check
*	• Ion Transition Check
	• Ion Ratios
	• Initial/Continuing Calibrations
*	• Laboratory Instrument/Method and Field Blank Results
	• Extraction Internal Standard Recoveries
	• Laboratory Control Sample Results
	• Matrix Spike/Matrix Spike Duplicate Results
*	• Laboratory Duplicate Precision
	• Field Duplicate Precision
*	• Compound Identification
*	• Compound Quantitation

* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, and documentation supporting these findings is presented in Appendix C.

INITIAL/CONTINUING CALIBRATIONS

The Continuing Calibration Verification (CCV) performed on 07/30/2021 @ 18:32 had a Percent Recovery (%R) for N-methylperfluorooctane sulfonamidoacetate (NMFOSA) which exceeded the 130% quality control limit. Samples AOPC17,21-WU5-12-072021, AOPC21-W6-5-072021, AOPC9-W2-13-072021, and SWB-01-072021 were affected. The non-detected results reported for NMFOSA in the affected samples were qualified as estimated, (UJ).

ION RATIOS

The following compounds had ion ratio %Rs outside the 50%-150% quality control limits:

Sample	Compound
AOPC3-W7-3-071921	Perfluoropentanesulfonic acid (PFPeS)
AOPC03-W7-13-071921	Perfluorononanoic acid (PFNA)
AOPC03-UST-MW-02-071921	Perfluorododecanoic acid (PFDoA)
AOPC17,21-WU5-12-072021	Perfluorooctane sulfonamide (FOSA)

The detected results reported for these compounds in these samples were qualified as estimated, (J).

EXTRACTED INTERNAL STANDARD RECOVERIES

The %R for extracted internal standard compound, 13C2-4:2 fluorotelomer sulfonate (4:2FTS), was above the 150% quality control limit in samples AOPC10-WGC2-10-072121 and AOPC21-W4-14-071921. In addition, the %Rs for 13C2-perfluorododecaonoic acid (PFDoA), 13C2-perfluorotetradecanoic acid (PFTeA), and 13C9-perfluorobutanoic acid (PFBA) were below 50% but greater than 20% in sample AOPC10-WGC2-10-072121. The laboratory did not re-extract/reanalyze due to evidence of matrix interference. No action was taken for the compound associated with 13C2-4:2FTS because this compound was not detected in sample AOPC10-WGC2-10-072121 but was qualified in sample AOPC21-W4-14-071921 as estimated (J+). The detected result reported the affected compound, PFBA, was qualified as estimated with a high bias, (J+). The non-detected results reported for PFDoA and PFTeA were qualified as estimated, (UJ).

LABORATORY CONTROL SAMPLE RESULTS

The Laboratory Control Sample (LCS) analysis associated with preparation batch #10188 had a %R for perfluoropentanesulfonic acid (PFPeS) which exceeded the upper quality control limit. All samples, except samples AOPC21-W4-14-071921 and FB-09-071921 (due to insufficient volume), were re-extracted/reanalyzed. The samples reanalyzed in preparation batch #10675 had high %Rs for 6:2FTS and PFPeS, therefore, the initial analysis was used in the data validation. The detected result reported for PFPeS in sample AOPC03-W7-13-071921 was qualified as estimated, (J), due to conflicting directional bias. The detected results reported for PFPeS in samples AOPC03-UST-MW-02-071921, AOPC21-W4-14-071921, AOPC21-W6-6-071921, AOPC3-W7-11-071921, and AOPC3-W7-3-071921-FD were qualified as estimated with a high bias, (J+). No action was taken for sample FB-09-071921 because PFPeS was not detected in this sample. No action was taken for samples AOPC24-W89-1-071921 and AOPC3-W7-3-071921 because these samples were reanalyzed for PFPeS in preparation batch #10648 with an acceptable LCS %R for PFPeS.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

The Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses of sample AOPC17,21-WU5-12-072021 had MS %R for 6:2FTS and Relative Percent Difference (RPD) which exceeded the upper quality control limits.

The detected result reported for 6:2FTS in the parent sample was qualified as estimated, (J), due to conflicting directional bias.

FIELD DUPLICATE PRECISION

The RPD for 6:2FTS exceeded the 30% quality control limit in the field duplicate pair, AOPC3-W7-3-071921/AOPC3-W7-3-071921-FD. The detected results reported for this compound in the field duplicate pair were qualified as estimated, (J), due to field duplicate imprecision.

Additional Comments

The %Rs for the extracted internal standard compound, 13C2-4:2FTS, were above the upper quality control limit in samples AOPC03-W7-13-071921, AOPC03-UST-MW-02-071921, and AOPC17,21-WU5-12-072021. No action was taken because the compound associated with this extracted internal standard was not detected in these samples.

The %Rs for the extracted internal standard compounds, 13C2-4:2FTS and 13C2-8:2FTS, were above the upper quality control limit in sample AOPC21-W4-14-071921. No action was taken because the compounds associated with these extracted internal standards were not detected in this sample.

The RPD for PFHxS in the laboratory duplicate analysis of sample AOPC21-W4-14-071921 exceeded the 20% quality control criterion. No action was taken because the detected results were below the LOQ.

Detected results reported below the limit of quantitation (LOQ) but above the Detection Limit (DL) were qualified as estimated, (J). Non-detected results were reported to the limit of detection (LOD).

Instances of manual integrations were present in this data package. All manual integrations were documented by the laboratory and are noted in the raw data of the original data package.

Executive Summary

Laboratory Performance Issues: A CCV had a %R above the quality control limit. Ion ratio %Rs were noncompliant in some samples. Extracted internal standards were noncompliant. A LCS %R was high.

Other Factors Affecting Data Quality: The MS/MSD analyses had a high %R. Field duplicate imprecision was noted for one compound. Some samples were diluted. Detected results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled “Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis be QSM Table B15” (May 1, 2020). The text of this report has been formulated to address only those areas affecting data quality.

Michelle L. Woeber

Tetra Tech, Inc.
Michelle L. Woeber
Chemist/Data Validator

Joseph A. Samchuck

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

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

Data Qualifier Definitions

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

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

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

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

PROJ_NO: 09033A	NSAMPLE	AOPC03-UST-MW-02-071921			AOPC03-W7-13-071921			AOPC10-WGC2-10-072121			AOPC10-WGC2-1-072121		
SDG: WG22011	LAB_ID	WG22011-006			WG22011-005			WG22011-019			WG22011-020		
FRACTION: PFAS	SAMP_DATE	7/19/2021			7/19/2021			7/21/2021			7/21/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.9	U		3.5	U		3.9	U		4	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.9	U		3.5	U		3.9	U		4	U	
4:2 FLUOROTELOMER SULFONATE		3.9	U		3.5	U		3.9	U		4	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		290			210			3.9	U		4.4	J	P
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.9	U		3.5	U		3.9	U		4	U	
9CL-PF3ONS		3.9	U		3.5	U		3.9	U		4	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		6.1	J	P	3.5	U		3.9	U		4	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.9	U		3.5	U		3.9	U		4	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.9	U		3.5	U		3.9	U		4	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		15			17			24			4.7		
PERFLUOROBUTANESULFONIC ACID (PFBS)		13			7.6			29			18		
PERFLUOROBUTANOIC ACID (PFBA)		18			11			59	J+	N	19		
PERFLUORODECANESULFONIC ACID (PFDS)		1.9	U		1.8	U		2	U		2	U	
PERFLUORODECANOIC ACID (PFDA)		1.2	J	P	1.8	U		2	U		2	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.4	J	PQ	1.8	U		2	UJ	N	2	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.4	J	P	1.8	U		2	U		2	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		2.9	J	P	2.1	J	P	16			2.6	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		57			36			26			26		
PERFLUOROHEXANOIC ACID (PFHXA)		3.3	J	P	2.1	J	P	48			8.4		
PERFLUORONONANESULFONIC ACID (PFNS)		1.9	U		1.8	U		2	U		2	U	
PERFLUORONONANOIC ACID (PFNA)		1.9	U		1.6	J	PQ	2.7	J	P	2	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.9	U		0.93	J	P	2	U		2	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		50			23			9.1			4.5		
PERFLUOROPENTANESULFONIC ACID (PFPES)		5.6	J+	E	3.2	J	EP	5.1			7.5		

PROJ_NO: 09033A	NSAMPLE	AOPC10-WGC2-13-072121			AOPC10-WGC2-8-072121			AOPC17,21-WU5-12-072021			AOPC21-W4-14-071921		
SDG: WG22011	LAB_ID	WG22011-017			WG22011-018			WG22011-012			WG22011-007		
FRACTION: PFAS	SAMP_DATE	7/21/2021			7/21/2021			7/20/2021			7/19/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.7	U		3.4	U		3.7	U		3.8	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.7	U		3.4	U		3.7	U		3.8	U	
4:2 FLUOROTELOMER SULFONATE		3.7	U		3.4	U		3.7	U		3.8	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		3.7	U		7			3.5	J	DP	14		
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.7	U		3.4	U		3.7	U		3.8	U	
9CL-PF3ONS		3.7	U		3.4	U		3.7	U		3.8	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.7	U		3.4	U		3.7	U		3.8	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.7	U		3.4	U		3.7	U		3.8	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.7	U		3.4	U		3.7	UJ	C	3.8	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.9	U		41			1.8	J	P	60		
PERFLUOROBUTANESULFONIC ACID (PFBS)		16			5.4			1.9	U		13		
PERFLUOROBUTANOIC ACID (PFBA)		21			11			3.3	J	P	40		
PERFLUORODECANESULFONIC ACID (PFDS)		1.9	U		1.7	U		1.9	U		1.9	U	
PERFLUORODECANOIC ACID (PFDA)		1.9	U		1.7	U		1.9	U		2.5	J	P
PERFLUORODODECANOIC ACID (PFDOA)		1.9	U		1.7	U		1.9	U		1.9	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.9	U		3.1	J	P	1.9	U		1.4	J	P
PERFLUOROHEPTANOIC ACID (PFHPA)		1.9	U		4.6			1.9	U		8.5		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		17			37			2.1	J	P	67		
PERFLUOROHEXANOIC ACID (PFHXA)		1.9	U		9.2			1.7	J	P	20		
PERFLUORONONANESULFONIC ACID (PFNS)		1.9	U		1.7	U		1.9	U		1.9	U	
PERFLUORONONANOIC ACID (PFNA)		1.9	U		1.7	U		1.9	U		3.5	J	P
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.9	U		1.7	U		1.2	J	PQ	1.9	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		1.4	J	P	53			1.9	U		70		
PERFLUOROPENTANESULFONIC ACID (PFPES)		6.2			2.7	J	P	1.9	U		5.4	J+	E

PROJ_NO: 09033A	NSAMPLE	AOPC21-W4-6-072021			AOPC21-W6-5-072021			AOPC21-W6-6-071921			AOPC21-WU5-10-072021		
SDG: WG22011	LAB_ID	WG22011-015			WG22011-011			WG22011-008			WG22011-014		
FRACTION: PFAS	SAMP_DATE	7/20/2021			7/20/2021			7/19/2021			7/20/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		4	U		3.9	U		3.9	U		4	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		4	U		3.9	U		3.9	U		4	U	
4:2 FLUOROTELOMER SULFONATE		4	U		3.9	U		3.9	U		4	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		60			12			7.8			6	J	P
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		4	U		3.9	U		3.9	U		4	U	
9CL-PF3ONS		4	U		3.9	U		3.9	U		4	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		4	U		3.9	U		3.9	U		4	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		4	U		3.9	U		3.9	U		4	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		4	UJ	C	3.9	U		3.9	U		4	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		12			27			31			8.4		
PERFLUOROBUTANESULFONIC ACID (PFBS)		8.9			31			9.9			2.8	J	P
PERFLUOROBUTANOIC ACID (PFBA)		20			19			17			8		
PERFLUORODECANESULFONIC ACID (PFDS)		2	U		2	U		2	U		2	U	
PERFLUORODECANOIC ACID (PFDA)		3.9			2	U		2	U		1.7	J	P
PERFLUORODODECANOIC ACID (PFDOA)		2	U		2	U		2	U		2	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		2	U		1.1	J	P	1.7	J	P	2	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		2.8	J	P	2.6	J	P	11			2.6	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		3	J	P	77			73			1	J	P
PERFLUOROHEXANOIC ACID (PFHXA)		13			2.3	J	P	8.3			14		
PERFLUORONONANESULFONIC ACID (PFNS)		2	U		2	U		2	U		2	U	
PERFLUORONONANOIC ACID (PFNA)		1.9	J	P	2	U		2	U		1.2	J	P
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2	U		2	U		2	U		2	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		6.4			52			81			3.5	J	P
PERFLUOROPENTANESULFONIC ACID (PFPES)		2	U		8.9			5.5	J+	E	2	U	

PROJ_NO: 09033A	NSAMPLE	AOPC24-W89-1-071921			AOPC3-W7-11-071921			AOPC3-W7-3-071921			AOPC3-W7-3-071921-FD		
SDG: WG22011	LAB_ID	WG22011-001			WG22011-004			WG22011-002			WG22011-003		
FRACTION: PFAS	SAMP_DATE	7/19/2021			7/19/2021			7/19/2021			7/19/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF										AOPC3-W7-3-071921		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.7	U		4	U		3.7	U		3.5	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.7	U		4	U		3.7	U		3.5	U	
4:2 FLUOROTELOMER SULFONATE		3.7	U		4	U		3.7	U		3.5	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		43			2.6	J	P	48	J	G	28	J	G
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.7	U		4	U		3.7	U		3.5	U	
9CL-PF3ONS		3.7	U		4	U		3.7	U		3.5	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.7	U		4	U		3.7	U		3.5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.7	U		8.3			3.7	U		3.5	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.7	U		4	U		3.7	U		3.5	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		11			19			20			19		
PERFLUOROBUTANESULFONIC ACID (PFBS)		40			13			7.9			7.5		
PERFLUOROBUTANOIC ACID (PFBA)		12			12			12			12		
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U		2	U		1.9	U		1.8	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U		2	U		1.9	U		1.8	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U		1.1	J	P	1.9	U		1.8	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		0.94	J	P	1.3	J	P	1.9	U		1.8	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		4.2			2.5	J	P	1.9	U		0.93	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		130			65			40			42		
PERFLUOROHEXANOIC ACID (PFHXA)		21			4.1			1.4	J	P	1.2	J	P
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U		2	U		1.9	U		1.8	U	
PERFLUORONONANOIC ACID (PFNA)		1.8	U		2	U		1.9	U		1.8	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.8	U		2	U		1.9	U		1.8	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		57			59			33			30		
PERFLUOROPENTANESULFONIC ACID (PFPES)		34			8.8	J+	E	4.2	J	Q	4.1	J+	E

PROJ_NO: 09033A	NSAMPLE	AOPC9-W2-13-072021			FB-09-071921			FB-10-072021			FB-11-072121		
SDG: WG22011	LAB_ID	WG22011-010			WG22011-009			WG22011-016			WG22011-021		
FRACTION: PFAS	SAMP_DATE	7/20/2021			7/19/2021			7/20/2021			7/21/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.7	U		5	U		3.6	U		3.9	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.7	U		5	U		3.6	U		3.9	U	
4:2 FLUOROTELOMER SULFONATE		3.7	U		5	U		3.6	U		3.9	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		2.9	J	P	5	U		3.6	U		3.9	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.7	U		5	U		3.6	U		3.9	U	
9CL-PF3ONS		3.7	U		5	U		3.6	U		3.9	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.7	U		5	U		3.6	U		3.9	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.7	U		5	U		3.6	U		3.9	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.7	UJ	C	5	U		3.6	U		3.9	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		32			2.6	U		1.8	U		2	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		21			2.6	U		1.8	U		2	U	
PERFLUOROBUTANOIC ACID (PFBA)		29			2.6	U		1.8	U		2	U	
PERFLUORODECANESULFONIC ACID (PFDS)		1.9	U		2.6	U		1.8	U		2	U	
PERFLUORODECANOIC ACID (PFDA)		1.9	U		2.6	U		1.8	U		2	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.9	U		2.6	U		1.8	U		2	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.9	U		2.6	U		1.8	U		2	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		6.2			2.6	U		1.8	U		2	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		110			2.6	U		1.8	U		2	U	
PERFLUOROHEXANOIC ACID (PFHXA)		23			2.6	U		1.8	U		2	U	
PERFLUORONONANESULFONIC ACID (PFNS)		1.9	U		2.6	U		1.8	U		2	U	
PERFLUORONONANOIC ACID (PFNA)		1.9	U		2.6	U		1.8	U		2	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.9	U		2.6	U		1.8	U		2	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		9.1			2.6	U		1.8	U		2	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		17			2.6	U		1.8	U		2	U	

PROJ_NO: 09033A	NSAMPLE	SWB-01-072021		
SDG: WG22011	LAB_ID	WG22011-013		
FRACTION: PFAS	SAMP_DATE	7/20/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
11CL-PF3OUDS		3.4	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.4	U	
4:2 FLUOROTELOMER SULFONATE		3.4	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		3.4	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.4	U	
9CL-PF3ONS		3.4	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.4	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.4	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.4	UJ	C
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.7	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		1.7	U	
PERFLUOROBUTANOIC ACID (PFBA)		1.7	U	
PERFLUORODECANESULFONIC ACID (PFDS)		1.7	U	
PERFLUORODECANOIC ACID (PFDA)		1.7	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.7	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.7	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		1.7	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		1.7	U	
PERFLUOROHEXANOIC ACID (PFHXA)		1.7	U	
PERFLUORONONANESULFONIC ACID (PFNS)		1.7	U	
PERFLUORONONANOIC ACID (PFNA)		1.7	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.7	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		1.7	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		1.7	U	

PROJ_NO: 09033A	NSAMPLE	AOPC03-UST-MW-02-071921			AOPC03-W7-13-071921			AOPC10-WGC2-10-072121			AOPC10-WGC2-1-072121		
SDG: WG22011	LAB_ID	WG22011-006			WG22011-005			WG22011-019			WG22011-020		
FRACTION: PFAS	SAMP_DATE	7/19/2021			7/19/2021			7/21/2021			7/21/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		5.1			1.2	J	P	41			6.1		
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.9	U		1.8	U		2	UJ	N	2	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.9	U		1.8	U		2	U		2	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.9	U		1.8	U		2	U		2	U	

PROJ_NO: 09033A	NSAMPLE	AOPC10-WGC2-13-072121			AOPC10-WGC2-8-072121			AOPC17,21-WU5-12-072021			AOPC21-W4-14-071921		
SDG: WG22011	LAB_ID	WG22011-017			WG22011-018			WG22011-012			WG22011-007		
FRACTION: PFAS	SAMP_DATE	7/21/2021			7/21/2021			7/20/2021			7/19/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.9	U		7.7			1.4	J	P	12		
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.9	U		1.7	U		1.9	U		1.9	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.9	U		1.7	U		1.9	U		1.9	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.9	U		1.7	U		1.9	U		1.9	U	

PROJ_NO: 09033A	NSAMPLE	AOPC21-W4-6-072021			AOPC21-W6-5-072021			AOPC21-W6-6-071921			AOPC21-WU5-10-072021		
SDG: WG22011	LAB_ID	WG22011-015			WG22011-011			WG22011-008			WG22011-014		
FRACTION: PFAS	SAMP_DATE	7/20/2021			7/20/2021			7/19/2021			7/20/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		6.6			1.7	J	P	5.7			11		
PERFLUOROTETRADECANOIC ACID (PFTEA)		2	U		2	U		2	U		2	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2	U		2	U		2	U		2	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		2	U		2	U		2	U		2	U	

PROJ_NO: 09033A	NSAMPLE	AOPC24-W89-1-071921			AOPC3-W7-11-071921			AOPC3-W7-3-071921			AOPC3-W7-3-071921-FD		
SDG: WG22011	LAB_ID	WG22011-001			WG22011-004			WG22011-002			WG22011-003		
FRACTION: PFAS	SAMP_DATE	7/19/2021			7/19/2021			7/19/2021			7/19/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF										AOPC3-W7-3-071921		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		13			2.4	J	P	1.9	U		1.8	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U		14			1.9	U		1.8	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U		2.1	J	P	1.9	U		1.8	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U		2	U		1.9	U		1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC9-W2-13-072021			FB-09-071921			FB-10-072021			FB-11-072121		
SDG: WG22011	LAB_ID	WG22011-010			WG22011-009			WG22011-016			WG22011-021		
FRACTION: PFAS	SAMP_DATE	7/20/2021			7/19/2021			7/20/2021			7/21/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		38			2.6	U		1.8	U		2	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.9	U		2.6	U		1.8	U		2	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.9	U		2.6	U		1.8	U		2	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.9	U		2.6	U		1.8	U		2	U	

PROJ_NO: 09033A	NSAMPLE	SWB-01-072021		
SDG: WG22011	LAB_ID	WG22011-013		
FRACTION: PFAS	SAMP_DATE	7/20/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.7	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.7	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.7	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.7	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-001
Description: AOPC24-W89-1-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1726	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1722	JJG	07/30/2021 1838	10648

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	43		7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	40		3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.94	J	3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	34		3.8	1.9	0.95	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	130		3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	4.2		3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	21		3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	11		3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	13		3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	57		3.6	1.8	0.91	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		94	50-150		85	50-150
13C2_6:2FTS		114	50-150		101	50-150
13C2_8:2FTS		91	50-150		94	50-150
13C2_PFDoA		89	50-150		72	50-150
13C2_PFTeDA		93	50-150		75	50-150
13C3_PFBS		87	50-150		81	50-150
13C3_PFHxS		84	50-150		79	50-150
13C3-HFPO-DA		93	50-150		88	50-150
13C4_PFBA		95	50-150		86	50-150
13C4_PFHpA		84	50-150		85	50-150
13C5_PFHxA		86	50-150		82	50-150
13C5_PFPeA		91	50-150		88	50-150
13C6_PFDA		85	50-150		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-001
Description: AOPC24-W89-1-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		96	50-150		74	50-150
13C8_PFOA		100	50-150		94	50-150
13C8_PFOS		85	50-150		79	50-150
13C8_PFOSA		86	50-150		85	50-150
13C9_PFNA		93	50-150		80	50-150
d5-EtFOSAA		99	50-150		80	50-150
d3-MeFOSAA		94	50-150		82	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-002
Description: AOPC3-W7-3-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1758	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1732	JJG	07/30/2021 1838	10648

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	48		7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.9		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.2		3.5	1.8	0.88	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	40		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.4	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	20		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	33		3.7	1.9	0.92	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		83	50-150		93	50-150
13C2_6:2FTS		105	50-150		84	50-150
13C2_8:2FTS		82	50-150		94	50-150
13C2_PFDoA		76	50-150		74	50-150
13C2_PFTeDA		78	50-150		81	50-150
13C3_PFBS		75	50-150		82	50-150
13C3_PFHxS		86	50-150		81	50-150
13C3-HFPO-DA		85	50-150		87	50-150
13C4_PFBA		85	50-150		86	50-150
13C4_PFHpA		89	50-150		89	50-150
13C5_PFHxA		75	50-150		82	50-150
13C5_PFPeA		88	50-150		82	50-150
13C6_PFDA		81	50-150		81	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-002
Description: AOPC3-W7-3-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		89	50-150		71	50-150
13C8_PFOA		96	50-150		93	50-150
13C8_PFOS		78	50-150		83	50-150
13C8_PFOSA		83	50-150		91	50-150
13C9_PFNA		84	50-150		84	50-150
d5-EtFOSAA		82	50-150		82	50-150
d3-MeFOSAA		85	50-150		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-003
Description: AOPC3-W7-3-071921-FD
Matrix: Aqueous
Date Sampled: 07/19/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1808	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1108	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	28		7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.5		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.1	L	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	42		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.93	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	19		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	30		3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		94	50-150		84	50-150
13C2_6:2FTS		113	50-150		135	50-150
13C2_8:2FTS		94	50-150		87	50-150
13C2_PFDoA		79	50-150		73	50-150
13C2_PFTeDA		82	50-150		77	50-150
13C3_PFBS		88	50-150		92	50-150
13C3_PFHxS		85	50-150		81	50-150
13C3-HFPO-DA		87	50-150		95	50-150
13C4_PFBA		88	50-150		88	50-150
13C4_PFHpA		85	50-150		89	50-150
13C5_PFHxA		78	50-150		79	50-150
13C5_PFPeA		87	50-150		81	50-150
13C6_PFDA		83	50-150		79	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-003
Description: AOPC3-W7-3-071921-FD
Matrix: Aqueous
Date Sampled: 07/19/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		86	50-150		86	50-150
13C8_PFOA		95	50-150		95	50-150
13C8_PFOS		87	50-150		79	50-150
13C8_PFOSA		86	50-150		90	50-150
13C9_PFNA		88	50-150		90	50-150
d5-EtFOSAA		91	50-150		84	50-150
d3-MeFOSAA		94	50-150		86	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-003
Description: AOPC3-W7-3-071921-FD
Matrix: Aqueous
Date Sampled: 07/19/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1808	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1108	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	50	L	7.2	3.6	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.3		3.6	1.8	0.90	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.8	L	3.6	1.8	0.90	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	37		3.6	1.8	0.90	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	11		3.6	1.8	0.90	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.5	J	3.6	1.8	0.90	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	20		3.6	1.8	0.90	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	31		3.6	1.8	0.90	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		94	50-150		84	50-150
13C2_6:2FTS		113	50-150		135	50-150
13C2_8:2FTS		94	50-150		87	50-150
13C2_PFDoA		79	50-150		73	50-150
13C2_PFTeDA		82	50-150		77	50-150
13C3_PFBS		88	50-150		92	50-150
13C3_PFHxS		85	50-150		81	50-150
13C3-HFPO-DA		87	50-150		95	50-150
13C4_PFBA		88	50-150		88	50-150
13C4_PFHpA		85	50-150		89	50-150
13C5_PFHxA		78	50-150		79	50-150
13C5_PFPeA		87	50-150		81	50-150
13C6_PFDA		83	50-150		79	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-003
Description: AOPC3-W7-3-071921-FD
Matrix: Aqueous
Date Sampled: 07/19/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		86	50-150		86	50-150
13C8_PFOA		95	50-150		95	50-150
13C8_PFOS		87	50-150		79	50-150
13C8_PFOSA		86	50-150		90	50-150
13C9_PFNA		88	50-150		90	50-150
d5-EtFOSAA		91	50-150		84	50-150
d3-MeFOSAA		94	50-150		86	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-004
Description: AOPC3-W7-11-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1819	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1118	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.6	J	7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	8.3		7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	13		3.9	2.0	0.98	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.3	J	3.9	2.0	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	8.8	L	3.9	2.0	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	65		3.9	2.0	0.98	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.9	2.0	0.98	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.1	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.5	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.1		3.9	2.0	0.98	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	19		3.9	2.0	0.98	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.4	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	14		3.9	2.0	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	59		3.9	2.0	0.98	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		80	50-150		85	50-150
13C2_6:2FTS		96	50-150		128	50-150
13C2_8:2FTS		69	50-150		92	50-150
13C2_PFDoA		59	50-150		74	50-150
13C2_PFTeDA		61	50-150		69	50-150
13C3_PFBS		67	50-150		98	50-150
13C3_PFHxS		68	50-150		75	50-150
13C3-HFPO-DA		71	50-150		97	50-150
13C4_PFBA		73	50-150		91	50-150
13C4_PFHpA		72	50-150		93	50-150
13C5_PFHxA		66	50-150		93	50-150
13C5_PFPeA		74	50-150		86	50-150
13C6_PFDA		65	50-150		78	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-004
Description: AOPC3-W7-11-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		70	50-150		83	50-150
13C8_PFOA		80	50-150		100	50-150
13C8_PFOS		71	50-150		87	50-150
13C8_PFOSA		68	50-150		90	50-150
13C9_PFNA		74	50-150		91	50-150
d5-EtFOSAA		71	50-150		87	50-150
d3-MeFOSAA		71	50-150		83	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-004
Description: AOPC3-W7-11-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1819	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1118	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	UL	7.6	3.8	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	2.7	J	7.6	3.8	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.8		3.8	1.9	0.95	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.1	J	3.8	1.9	0.95	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	7.7	L	3.8	1.9	0.95	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	60		3.8	1.9	0.95	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	10		3.8	1.9	0.95	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.3	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.1	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	18		3.8	1.9	0.95	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	5.5		3.8	1.9	0.95	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	54		3.8	1.9	0.95	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		80	50-150		85	50-150
13C2_6:2FTS		96	50-150		128	50-150
13C2_8:2FTS		69	50-150		92	50-150
13C2_PFDoA		59	50-150		74	50-150
13C2_PFTeDA		61	50-150		69	50-150
13C3_PFBS		67	50-150		98	50-150
13C3_PFHxS		68	50-150		75	50-150
13C3-HFPO-DA		71	50-150		97	50-150
13C4_PFBA		73	50-150		91	50-150
13C4_PFHpA		72	50-150		93	50-150
13C5_PFHxA		66	50-150		93	50-150
13C5_PFPeA		74	50-150		86	50-150
13C6_PFDA		65	50-150		78	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-004
Description: AOPC3-W7-11-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		70	50-150		83	50-150
13C8_PFOA		80	50-150		100	50-150
13C8_PFOS		71	50-150		87	50-150
13C8_PFOSA		68	50-150		90	50-150
13C9_PFNA		74	50-150		91	50-150
d5-EtFOSAA		71	50-150		87	50-150
d3-MeFOSAA		71	50-150		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-005
Description: AOPC03-W7-13-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1830	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1129	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	210		7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	UQ	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.6		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	0.93	J	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.2	JL	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	36		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	11		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.1	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.1	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.6	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	17		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	23		3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	165	50-150		110	50-150
13C2_6:2FTS		106	50-150		138	50-150
13C2_8:2FTS		88	50-150		98	50-150
13C2_PFDoA		80	50-150		79	50-150
13C2_PFTeDA		78	50-150		84	50-150
13C3_PFBS		90	50-150		99	50-150
13C3_PFHxS		89	50-150		82	50-150
13C3-HFPO-DA		94	50-150		102	50-150
13C4_PFBA		93	50-150		92	50-150
13C4_PFHpA		88	50-150		95	50-150
13C5_PFHxA		93	50-150		91	50-150
13C5_PFPeA		107	50-150		88	50-150
13C6_PFDA		82	50-150		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-005
Description: AOPC03-W7-13-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		89	50-150		90	50-150
13C8_PFOA		96	50-150		101	50-150
13C8_PFOS		84	50-150		84	50-150
13C8_PFOSA		86	50-150		87	50-150
13C9_PFNA		86	50-150		93	50-150
d5-EtFOSAA		93	50-150		90	50-150
d3-MeFOSAA		88	50-150		88	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-005
Description: AOPC03-W7-13-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1830	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1129	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	240	L	7.4	3.7	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.3		3.7	1.9	0.92	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.9	JL	3.7	1.9	0.92	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	32		3.7	1.9	0.92	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.2		3.7	1.9	0.92	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.6	J	3.7	1.9	0.92	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	J	3.7	1.9	0.92	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.2	J	3.7	1.9	0.92	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	14		3.7	1.9	0.92	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.2	J	3.7	1.9	0.92	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	31		3.7	1.9	0.92	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	165	50-150		110	50-150
13C2_6:2FTS		106	50-150		138	50-150
13C2_8:2FTS		88	50-150		98	50-150
13C2_PFDoA		80	50-150		79	50-150
13C2_PFTeDA		78	50-150		84	50-150
13C3_PFBS		90	50-150		99	50-150
13C3_PFHxS		89	50-150		82	50-150
13C3-HFPO-DA		94	50-150		102	50-150
13C4_PFBA		93	50-150		92	50-150
13C4_PFHpA		88	50-150		95	50-150
13C5_PFHxA		93	50-150		91	50-150
13C5_PFPeA		107	50-150		88	50-150
13C6_PFDA		82	50-150		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-005
Description: AOPC03-W7-13-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		89	50-150		90	50-150
13C8_PFOA		96	50-150		101	50-150
13C8_PFOS		84	50-150		84	50-150
13C8_PFOSA		86	50-150		87	50-150
13C9_PFNA		86	50-150		93	50-150
d5-EtFOSAA		93	50-150		90	50-150
d3-MeFOSAA		88	50-150		88	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-006
Description: AOPC03-UST-MW-02-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1425
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1840	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1139	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	290		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	6.1	J	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	13		3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.4	J	3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.6	L	3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	57		3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	18		3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.2	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.4	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.9	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.3	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	15		3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	5.1		3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	50		3.8	1.9	0.96	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	385	50-150	N	370	50-150
13C2_6:2FTS		128	50-150	N	188	50-150
13C2_8:2FTS		107	50-150		130	50-150
13C2_PFDoA		81	50-150		70	50-150
13C2_PFTeDA		68	50-150		64	50-150
13C3_PFBS		82	50-150		100	50-150
13C3_PFHxS		77	50-150		82	50-150
13C3-HFPO-DA		85	50-150		92	50-150
13C4_PFBA		92	50-150		94	50-150
13C4_PFHpA		90	50-150		95	50-150
13C5_PFHxA		102	50-150		103	50-150
13C5_PFPeA		110	50-150		104	50-150
13C6_PFDA		88	50-150		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-006
Description: AOPC03-UST-MW-02-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1425
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		90	50-150		93	50-150
13C8_PFOA		90	50-150		99	50-150
13C8_PFOS		73	50-150		83	50-150
13C8_PFOSA		84	50-150		97	50-150
13C9_PFNA		94	50-150		106	50-150
d5-EtFOSAA		106	50-150		114	50-150
d3-MeFOSAA		87	50-150		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-006
Description: AOPC03-UST-MW-02-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1425
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1840	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1139	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	320	QL	7.8	3.9	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	UQ	7.8	3.9	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	11		3.9	2.0	0.97	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.4	J	3.9	2.0	0.97	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.4	L	3.9	2.0	0.97	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	52		3.9	2.0	0.97	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	14		3.9	2.0	0.97	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	J	3.9	2.0	0.97	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	J	3.9	2.0	0.97	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.7	J	3.9	2.0	0.97	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.7	J	3.9	2.0	0.97	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.2	J	3.9	2.0	0.97	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	15		3.9	2.0	0.97	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	4.9		3.9	2.0	0.97	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	41		3.9	2.0	0.97	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	385	50-150	N	370	50-150
13C2_6:2FTS		128	50-150	N	188	50-150
13C2_8:2FTS		107	50-150		130	50-150
13C2_PFDoA		81	50-150		70	50-150
13C2_PFTeDA		68	50-150		64	50-150
13C3_PFBS		82	50-150		100	50-150
13C3_PFHxS		77	50-150		82	50-150
13C3-HFPO-DA		85	50-150		92	50-150
13C4_PFBA		92	50-150		94	50-150
13C4_PFHpA		90	50-150		95	50-150
13C5_PFHxA		102	50-150		103	50-150
13C5_PFPeA		110	50-150		104	50-150
13C6_PFDA		88	50-150		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-006
Description: AOPC03-UST-MW-02-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1425
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		90	50-150		93	50-150
13C8_PFOA		90	50-150		99	50-150
13C8_PFOS		73	50-150		83	50-150
13C8_PFOSA		84	50-150		97	50-150
13C9_PFNA		94	50-150		106	50-150
d5-EtFOSAA		106	50-150		114	50-150
d3-MeFOSAA		87	50-150		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-007
Description: AOPC21-W4-14-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1735
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1851	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	UQ	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	14	Q	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	UQ	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	13		3.8	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.4	J	3.8	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.4	L	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	67		3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	40		3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.5	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	8.5		3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	20		3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	3.5	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	60		3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	12		3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	70		3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	278	50-150
13C2_6:2FTS	N	226	50-150
13C2_8:2FTS	N	166	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		62	50-150
13C3_PFBS		73	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		71	50-150
13C4_PFBA		57	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		71	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		95	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-007
Description: AOPC21-W4-14-071921			Matrix: Aqueous
Date Sampled: 07/19/2021 1735		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	50-150
13C8_PFOS		74	50-150
13C8_PFOSA		73	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-008
Description: AOPC21-W6-6-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1750
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1912	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1150	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	7.8		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.9		3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	J	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.5	L	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	73		3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	17		3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	11		3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	8.3		3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	31		3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	5.7		3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	81		3.9	2.0	0.97	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		102	50-150		105	50-150
13C2_6:2FTS		103	50-150		135	50-150
13C2_8:2FTS		84	50-150		106	50-150
13C2_PFDoA		91	50-150		88	50-150
13C2_PFTeDA		89	50-150		87	50-150
13C3_PFBS		85	50-150		105	50-150
13C3_PFHxS		88	50-150		93	50-150
13C3-HFPO-DA		89	50-150		102	50-150
13C4_PFBA		94	50-150		98	50-150
13C4_PFHpA		92	50-150		98	50-150
13C5_PFHxA		86	50-150		90	50-150
13C5_PFPeA		94	50-150		96	50-150
13C6_PFDA		81	50-150		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-008
Description: AOPC21-W6-6-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1750
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		88	50-150		110	50-150
13C8_PFOA		97	50-150		104	50-150
13C8_PFOS		84	50-150		88	50-150
13C8_PFOSA		90	50-150		102	50-150
13C9_PFNA		91	50-150		99	50-150
d5-EtFOSAA		90	50-150		96	50-150
d3-MeFOSAA		89	50-150		95	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-008
Description: AOPC21-W6-6-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1750
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1912	JJG	07/27/2021 1619	10188
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1150	MMM	07/31/2021 1209	10675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	34	L	7.4	3.7	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.2		3.7	1.9	0.93	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.3	J	3.7	1.9	0.93	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.1	L	3.7	1.9	0.93	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	62		3.7	1.9	0.93	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	15		3.7	1.9	0.93	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	8.6		3.7	1.9	0.93	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7.5		3.7	1.9	0.93	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	29		3.7	1.9	0.93	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	5.1		3.7	1.9	0.93	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	70		3.7	1.9	0.93	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		102	50-150		105	50-150
13C2_6:2FTS		103	50-150		135	50-150
13C2_8:2FTS		84	50-150		106	50-150
13C2_PFDoA		91	50-150		88	50-150
13C2_PFTeDA		89	50-150		87	50-150
13C3_PFBS		85	50-150		105	50-150
13C3_PFHxS		88	50-150		93	50-150
13C3-HFPO-DA		89	50-150		102	50-150
13C4_PFBA		94	50-150		98	50-150
13C4_PFHpA		92	50-150		98	50-150
13C5_PFHxA		86	50-150		90	50-150
13C5_PFPeA		94	50-150		96	50-150
13C6_PFDA		81	50-150		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-008
Description: AOPC21-W6-6-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1750
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		88	50-150		110	50-150
13C8_PFOA		97	50-150		104	50-150
13C8_PFOS		84	50-150		88	50-150
13C8_PFOSA		90	50-150		102	50-150
13C9_PFNA		91	50-150		99	50-150
d5-EtFOSAA		90	50-150		96	50-150
d3-MeFOSAA		89	50-150		95	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-009
Description: FB-09-071921
Matrix: Aqueous
Date Sampled: 07/19/2021 1600
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/28/2021 1923	JJG	07/27/2021 1619	10188

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	5.0	U	10	5.0	2.5	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.6	UL	5.1	2.6	1.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.6	U	5.1	2.6	1.3	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		80	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		80	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-009
Description: FB-09-071921			Matrix: Aqueous
Date Sampled: 07/19/2021 1600		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		78	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-010
Description: AOPC9-W2-13-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1335
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 1925	JJG	07/28/2021 1734	10346

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.9	J	7.4	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	21		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	17		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	110		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	29		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	6.2		3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	23		3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	32		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	38		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.1		3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		93	50-150
13C2_6:2FTS		79	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		80	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		76	50-150
13C7_PFUdA		87	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-010
Description: AOPC9-W2-13-072021			Matrix: Aqueous
Date Sampled: 07/20/2021 1335		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		74	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-011
Description: AOPC21-W6-5-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1410
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 1936	JJG	07/28/2021 1734	10346

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	12		7.8	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	31		3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.1	J	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	8.9		3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	77		3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	19		3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.3	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	27		3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	52		3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		78	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		80	50-150
13C3_PFBS		77	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		73	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-011
Description: AOPC21-W6-5-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1410
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		75	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-012
Description: AOPC17,21-WU5-12-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1420
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 1947	JJG	07/28/2021 1734	10346

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	JS	7.4	3.7	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	UQ	7.4	3.7	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.2	J	3.7	1.9	0.93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.1	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.3	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.4	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	155	50-150
13C2_6:2FTS		106	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		72	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		93	50-150
13C5_PFPeA		98	50-150
13C6_PFDA		75	50-150
13C7_PFUdA		81	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-012
Description: AOPC17,21-WU5-12-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1420
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		80	50-150
13C9_PFNA		74	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-013
Description: SWB-01-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/30/2021 2019	JJG	07/28/2021 1734	10346

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	50-150
13C2_6:2FTS		112	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		77	50-150
13C3_PFHxS		78	50-150
13C3-HFPO-DA		80	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		77	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		87	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-013
Description: SWB-01-072021			Matrix: Aqueous
Date Sampled: 07/20/2021 1430		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	50-150
13C8_PFOS		75	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		74	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-014
Description: AOPC21-WU5-10-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1540
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1243	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.0	J	8.0	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.8	J	4.0	2.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.0	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	8.0		4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	14		4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.2	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	8.4		4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	11		4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.5	J	4.0	2.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		114	50-150
13C2_6:2FTS		127	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		71	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		73	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-014
Description: AOPC21-WU5-10-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1540
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-015
Description: AOPC21-W4-6-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1615
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1254	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	60		7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.9		3.9	2.0	0.98	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3.0	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	20		3.9	2.0	0.98	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	3.9		3.9	2.0	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.8	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	13		3.9	2.0	0.98	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	12		3.9	2.0	0.98	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	6.6		3.9	2.0	0.98	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	6.4		3.9	2.0	0.98	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		116	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		55	50-150
13C2_PFTeDA		56	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		69	50-150
13C3-HFPO-DA		74	50-150
13C4_PFBA		75	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		73	50-150
13C5_PFPeA		72	50-150
13C6_PFDA		63	50-150
13C7_PFUdA		70	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-015
Description: AOPC21-W4-6-072021			Matrix: Aqueous
Date Sampled: 07/20/2021 1615		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	50-150
13C8_PFOS		66	50-150
13C8_PFOSA		76	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		65	50-150
d3-MeFOSAA		69	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-016
Description: FB-10-072021
Matrix: Aqueous
Date Sampled: 07/20/2021 1650
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1304	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		85	50-150
13C2_6:2FTS		149	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		65	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		92	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		79	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		79	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-016
Description: FB-10-072021			Matrix: Aqueous
Date Sampled: 07/20/2021 1650		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		101	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-017
Description: AOPC10-WGC2-13-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0540
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1336	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	16		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	6.2		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	17		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	21		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.4	J	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		98	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		80	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-017
Description: AOPC10-WGC2-13-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0540
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-018
Description: AOPC10-WGC2-8-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1347	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	7.0		6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.4		3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	3.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.7	J	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	37		3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	11		3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	4.6		3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	9.2		3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	41		3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	7.7		3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	53		3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		103	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		69	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		69	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-018
Description: AOPC10-WGC2-8-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0545
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-019
Description: AOPC10-WGC2-10-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0730
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1357	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	UQ	7.8	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	29		3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.1		3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	26		3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	59	Q	3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	UQ	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	16		3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	48		3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.7	J	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	24		3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	41		3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	UQ	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	UQ	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.1		3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	163	50-150
13C2_6:2FTS		125	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA	N	43	50-150
13C2_PFTeDA	N	25	50-150
13C3_PFBS		74	50-150
13C3_PFHxS		69	50-150
13C3-HFPO-DA		65	50-150
13C4_PFBA	N	39	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		72	50-150
13C5_PFPeA		58	50-150
13C6_PFDA		66	50-150
13C7_PFUdA		78	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-019
Description: AOPC10-WGC2-10-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0730
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	50-150
13C8_PFOS		68	50-150
13C8_PFOSA		73	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		63	50-150
d3-MeFOSAA		69	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-020
Description: AOPC10-WGC2-1-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0740
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1408	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.4	J	7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	18		3.9	2.0	0.98	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	7.5		3.9	2.0	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	26		3.9	2.0	0.98	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	19		3.9	2.0	0.98	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.6	J	3.9	2.0	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	8.4		3.9	2.0	0.98	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.7		3.9	2.0	0.98	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	6.1		3.9	2.0	0.98	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.5		3.9	2.0	0.98	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		116	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		79	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		61	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		77	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		62	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		74	50-150
13C6_PFDA		67	50-150
13C7_PFUdA		73	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-020
Description: AOPC10-WGC2-1-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 0740
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	50-150
13C8_PFOS		69	50-150
13C8_PFOSA		83	50-150
13C9_PFNA		83	50-150
d5-EtFOSAA		73	50-150
d3-MeFOSAA		70	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG22011-021
Description: FB-11-072121
Matrix: Aqueous
Date Sampled: 07/21/2021 1100
Project Name: NASA ARC PFAS
Date Received: 07/22/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/03/2021 1418	MMM	07/29/2021 1100	10452

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		82	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		72	50-150
13C7_PFUdA		81	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG22011-021
Description: FB-11-072121			Matrix: Aqueous
Date Sampled: 07/21/2021 1100		Project Name: NASA ARC PFAS	
Date Received: 07/22/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		87	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		71	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

APPENDIX C

SUPPORT DOCUMENTATION

NASA-AMES
SDG WG22011

SAMPLE IDENTIFICATION	AOPC03-UST-MW-02-071921	
COMPOUND	6:2 FLUOROTELOMER SULFONATE (6:2FTS)	
COMPOUND AREA	401352	
INTERNAL STANDARD AMOUNT (ng/L)	5005	
DILUTION FACTOR	1	
INTERNAL STANDARD AREA	105203	
AVERAGE RRF	2.820442	
SAMPLE VOLUME (ml)	260	
VOLUME EXTRACT (ml)	10	
AUTOSAMPLER DILUTION	0.91	
CONCENTRATION =	286.1	ng/L
REPORTED CONCENTRATION	290	ng/L

(40`352 x 5005 ng/L x 10ml/(105203 x2.820442 x 260ml))/0.91

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821039.d		
Injection Date:	28-Jul-2021 18:40:36	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	32
Lab Sample ID:	WG22011-006	Lab Prep. Batch:	10188
Client ID:	AOPC03-UST-MW-02-071921	Sample Group:	WG22011
Sample Info:	WG22011-006	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Final Conc.:	Amt * DF * CF	Matrix/Level:	Aqueous

Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0422654

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	260	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.731	1.712	2	502674	16	>100:1			1001.00	911.64	92	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.731	1.712	2/0	201250	24	20:1			415.61	17.566		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.088	-1	553525	15	>100:1			1001.00	1072.02	109.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.067	2.088	-1/0	70530	11	11:1			120.18	5.0796		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.141	-1	146531	15	>100:1			1001.00	844.24	81.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.141	-1/0	57951	18	61:1	Target = 3.51		306.19	12.941		
298.9 > 99	44	2.120	2.141		15476	14	55:1	3.74 (1.75-5.27)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.425	2.487	-3/-2	18207	11	37:1	Target = 2.74		133.07	5.6243		
349 > 99	44	2.425	2.487		7466	12	38:1	2.43 (1.37-4.11)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.362	2.416	-3	363013	14	>100:1			5005.00	18209	385.2*	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.398	2.451	-3	644046	15	>100:1			1001.00	1067.95	102.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													J
313 > 269	49	2.398	2.451	-3/0	50703	13	18:1	Target = 19.67		77.091	3.2583		
313 > 119	49	2.398	2.451		3608	13	29:1	14.05 (9.83-29.50)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.505	2.567	-3	1003339	17	>100:1			5005.00	4711.16	84.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.575		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.746	2.827	-4	432819	15	>100:1			1001.00	892.44	89.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													J
363 > 319	47	2.746	2.827	-4/0	32855	13	28:1	Target = 3.69		67.758	2.8638		
363 > 169	47	2.755	2.827		9542	14	29:1	3.44 (1.84-5.53)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.755	2.846	-5	113087	17	>100:1			1001.00	814.27	77.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.755	2.846	-5/0	164497	24	>100:1	Target = 3.05	0.16	1359.72	57.469		
399 > 99	45	2.755	2.846		44861	24	>100:1	3.66 (1.52-4.57)	0.15				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.864		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													J
449 > 80	45	3.140	3.213	-4/1	3686	19	40:1	Target = 3.06		33.266	1.4060		
449 > 99	45	3.133	3.213		983	14	11:1	3.74 (1.53-4.59)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.100	3.187	-5	105203	22	>100:1			5005.00	6708.19	127.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.100	3.187	-5/0	401352	21	>100:1	Target = 1.82		6769.93	286.13		
427 > 81	64	3.107	3.187		221595	23	>100:1	1.81 (0.91-2.73)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.127	3.213	-5	424684	20	>100:1			1001.00	858.36	90.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.127	3.207	-4/1	157255	31	>100:1	Target = 2.88		390.40	16.500		M
413 > 169	53	3.127	3.207		56243	37	>100:1	2.79 (1.44-4.32)	0.14				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.506	3.584	-4	106192	25	>100:1			1001.00	762.46	73.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.506	3.584	-4/0	138794	40	>100:1	Target = 3.41	0.91	1178.57	49.813		
499 > 99	54	3.514	3.584		38280	36	>100:1	3.62 (1.70-5.12)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.796		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.935		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.235		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.396		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.514	3.592	-4	553713	18	>100:1			1001.00	908.93	93.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													Ja
463 > 419	56	3.521	3.592	-4/0	15585	18	17:1	Target = 6.36		26.743	1.1303		
463 > 169	56	3.499	3.592		1846	11	9.1:1	8.44 (3.18-9.54)					M
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.812	3.885	-4	257185	17	>100:1			1001.00	963.32	83.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.885		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.861	3.935	-4	98792	17	>100:1			5005.00	5836.67	107.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.935		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.869	3.943	-4	537629	18	>100:1			1001.00	911.46	88	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													J
513 > 469	51	3.869	3.943	-4/0	16582	17	18:1	Target = 13.35		28.967	1.2243		
513 > 169	51	3.869	3.943		1900	21	13:1	8.72 (6.67-20.03)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.025	4.105	-4	595931	17	>100:1			5005.00	4464.42	87	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.114		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.176	4.255	-4	552850	16	>100:1			1001.00	841.64	89.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.255		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.185	4.255	-4	678815	16	>100:1			5005.00	5906.32	106.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.265		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.444	4.533	-5	514659	17	>100:1			1001.00	693.21	81.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													J
613 > 569	38	4.444	4.533	-5/0	16907	17	32:1	Target = 10.01		32.464	1.3721		
613 > 169	38	4.444	4.533		1064	16		15.89 (5.00-15.02)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.774		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.883	4.991	-6	537908	16	>100:1			1001.00	614.73	67.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.991		ND								
*** 37 13C2_PFDA**													
515 > 470		3.869	3.943	-4	791198	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.398	2.451	-3	791337	14	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.127	3.213	-5	574378	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.731	1.712	2	597009	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.514	3.584	-4	165275	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

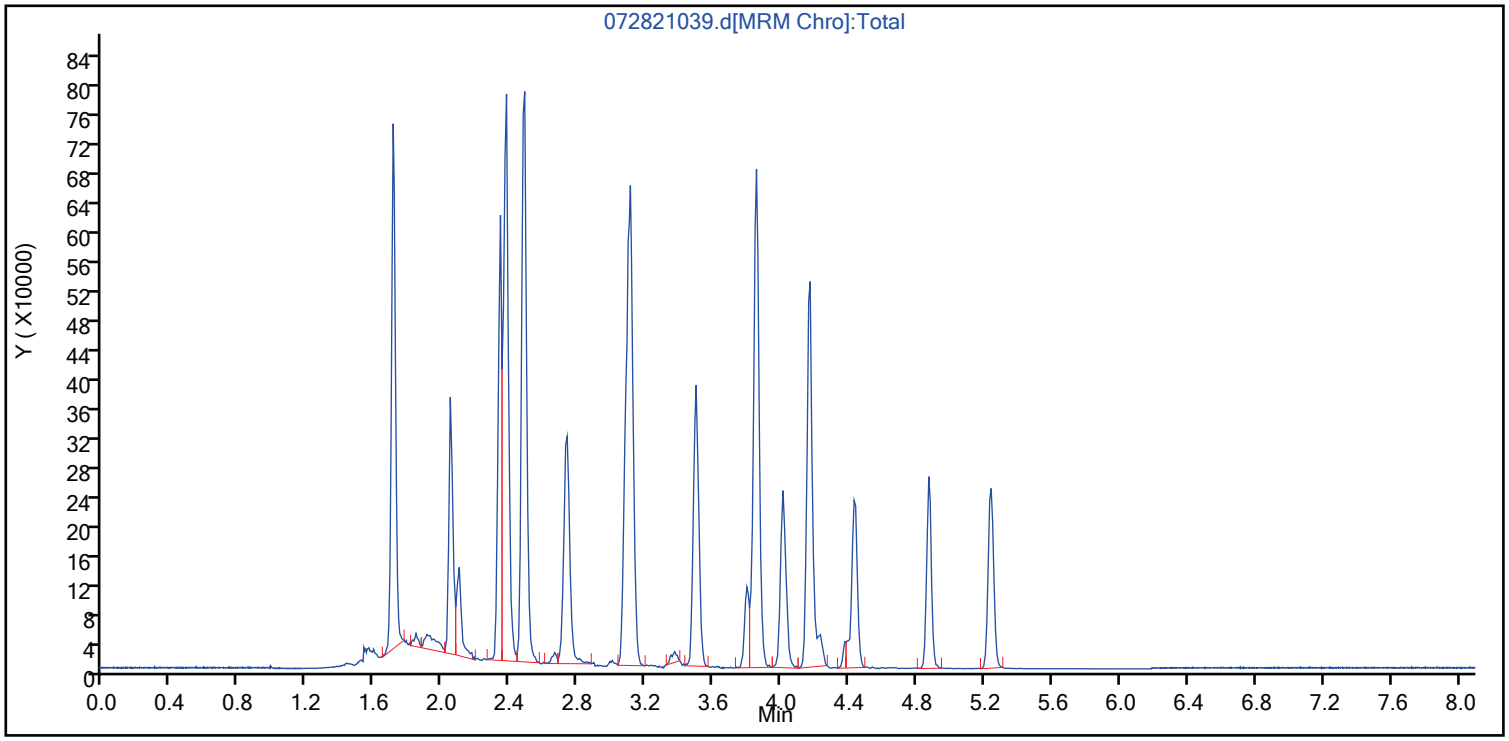
QC Flag Legend

U - Result Less Than Method Detection Limit
J - Compound Concentration Below Quantitation Limit
M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

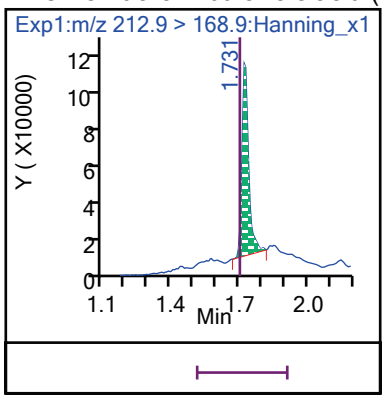
Report Date: 29-Jul-2021 18:54:47 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

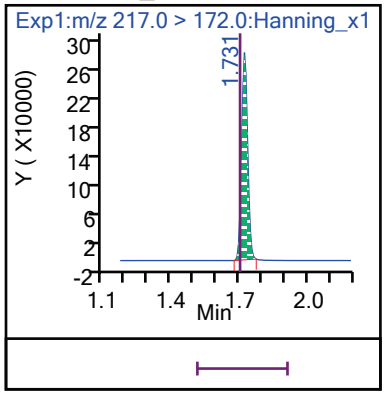
Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821039.d		
Injection Date:	28-Jul-2021 18:40:36	Inst. ID:	LCMSMS02.i
Client ID:	AOPC03-UST-MW-02-071921	Lab ID:	WG22011-006
Sample Info:	WG22011-006		
Dil. Factor:	1	Operator:	Justin Gavin



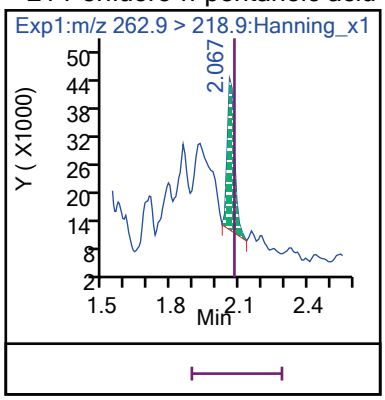
8 Perfluoro-n-butanoic acid (PFBA)



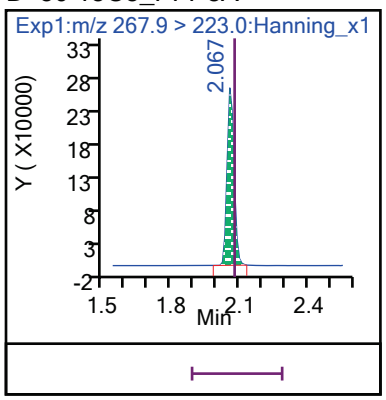
D 46 13C4_PFBA



21 Perfluoro-n-pentanoic acid (PFPeA)



D 50 13C5_PFPeA



ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 30%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
6:2 FLUOROTELOMER SULFONATE (6:2FTS)	48	28	3.5	52.63	TRUE	TRUE	TRUE	TRUE
PENTADECAFLUOROOCTANOIC ACID (PFOA)	20	19	1.8	5.13	FALSE	TRUE	TRUE	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	7.9	7.5	1.8	5.19	FALSE	TRUE	TRUE	FALSE
PERFLUOROBUTANOIC ACID (PFBA)	12	12	1.8	0.00	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEPTANOIC ACID (PFHPA)	1.9	0.93	1.8	68.55	TRUE	FALSE	FALSE	FALSE
PERFLUOROHEXANESULFONIC ACID (PFHXS)	40	42	1.8	4.88	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEXANOIC ACID (PFHXA)	1.4	1.2	1.8	15.38	FALSE	FALSE	FALSE	FALSE
PERFLUOROOCTANESULFONIC ACID (PFOS)	33	30	1.8	9.52	FALSE	TRUE	TRUE	FALSE
PERFLUOROPENTANESULFONIC ACID (PFPES)	4.2	4.1	1.8	2.41	FALSE	TRUE	TRUE	FALSE

SDG WG22011

AOPC3-W7-3-071921/AOPC3-W7-3-071921-FD

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122954

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x Cam Mus RCMa	Analysis (Attach list if more space is needed)	Page 1 of 3
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves Ryan Melendez		
Project Name: NASA ARC PFAS			WG22011
Project No.: 103IG667601; P.O. No.			KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Iced Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	6035 KG	Field Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC24-W89-1-071921	7/19/21	1210	G	X			2							X	
AOPC3-W7-3-071921	7/19/21	1430	G	X			2							X	
AOPC3-W7-3-071921-FD	7/19/21	1430	G	X			2							X	Field duplicate
AOPC3-W7-11-071921	7/19/21	1545	G	X			2							X	
AOPC03-W7-13-071921	7/19/21	1545	G	X			2							X	
AOPC03-UST-MW-02-071921	7/19/21	1425	G	X			2							X	
AOPC21-W4-14-071921	7/19/21	1735	G	X			2							X	
AOPC21-W6-6-071921	7/19/21	1750	G	X			2							X	
FB-09-071921	7/19/21	1600	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TE Cam Mus	7/21/21	1130	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fred Ex	7/22/21	915	4. Laboratory received by: Jacqueline Moore	7/22/21	915

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack
Receipt Temp. 2.1 °C
Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122956

Client: Tetra Tech
Address: 1999 Harrison St.
City: Oakland | State: CA | Zip Code: 94612
Project Name: NASA ARC PFAS
Project No.: 10316667601
P.O. No.:

Report to Contact: Mike Dahlquist
Sampler's Signature: x [signature]
Printed Name: Callie Neaves, Ryan Melendez, Elaia McDonald

Telephone No. / E-mail: (510)302-6310 / Mike.Dahlquist@tetratech.com
Analysis (Attach list if more space is needed)

Quote No.:
Page 2 of 3

WG22011
KES2

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 KIT	Field Filtered	PFAS (QSMB-15)	Remarks / Cooler I.D.
AOPC9-W2-13-072021	7/20/21	1335	G	X			2							X	
AOPC21-W6-5-072021	↓	1410	↓	↓			2							X	
AOPC17,21-WU5-12-072021	↓	1420	↓	↓			6							X	MS/MSD
SWB-01-072021	↓	1430	↓	↓			2							X	
AOPC21-WU5-10-072021	↓	1540	↓	↓			2							X	
AOPC21-W4-6-072021	↓	1615	↓	↓			2							X	
FB-10-072021	↓	1650	↓	↓			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	7/21/21	1130	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fred Ek	7/22/21	915	4. Laboratory received by: [signature]	7/22/21	915

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle): Yes No Ice Pack
Receipt Temp. 21 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122957

Client: Tetra Tech
Address: 1999 Harrison St.
City: Oakland | State: CA | Zip Code: 94612
Project Name: NASA ARC PFAS
Project No.: 103IG667601
P.O. No.:

Report to Contact: Mike Dahlquist
Sampler's Signature: x [signature] R Mel
Printed Name: Callie Neaves Ryan Melendez

Telephone No. / E-mail: (510)302-6310 / Mike.Dahlquist@tetratech.com
Analysis (Attach list if more space is needed)

Quote No.:
Page 3 of 3

WG22011
XES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G-Grab Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres	HNO3	HNO3	HCl	NaOH	NaOH	Field Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC10-WGC2-13-072121	7/21/21	0540	G	X			2							X	
AOPC10-WGC2-8-072121	7/21/21	0545	G	X			2							X	
AOPC10-WGC2-10-072121	7/21/21	0730	G	X			2							X	
AOPC10-WGC2-1-072121	7/21/21	0740	G	X			2							X	
FB-11-072121	7/21/21	1100	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)
Sample Disposal ☐ Return to Client ☐ Disposal by Lab
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	7/21/21	1130	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fed Ex	7/22/21	915	4. Laboratory received by: [signature]	7/22/21	915

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 2.1 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PaceAnalytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: JSM / 07/22/2021 Lot #: WG22011

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

2.1 / 2.1 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JSM Date: 07/22/2021

Comments:

Case Narrative
Tetra Tech
Lot Number: WG22011

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Samples WG22011-004, WG22011-019, WG22011-020 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

For samples WG22011-015, WG22011-019 sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Surrogate recovery may be adversely affected

10188

The laboratory control sample (LCS) for analytical batch 10421 recovered outside acceptance criteria for PFPeS. For the following sample there was an insufficient amount to perform a re-extraction or re-analysis: WG22011-007, WG22011-009. The data has been reported.

The laboratory control sample (LCS) for analytical batch 10188 recovered outside acceptance criteria for PFPeS. Affected samples were re-extracted and both sets of data have been reported.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for prep batch 10452 exceeded acceptance criteria for the following analytes: GenX. These analytes were biased high and were not detected in the samples affected: WG22011-014, WG22011-015, WG22011-016, WG22011-017, WG22011-018, WG22011-019, WG22011-020, WG22011-021.

The laboratory control sample (LCS) for prep batch 10675 recovered outside acceptance criteria for PFPeS and 6:2 FTS. For the following samples there was an insufficient amount to perform a re-extraction or re-analysis: WG22011-003, WG22011-004, WG22011-005, WG22011-006, WG22011-008. The data has been reported.

The continuing calibration verification (CCV) associated with samples WG22011-003, WG22011-004, WG22011-005, WG22011-006, WG22011-008, WG22011-014, WG22011-015, WG22011-016, WG22011-017, WG22011-018, WG22011-019, WG22011-020, WG22011-021 for analyte: GenX recovered above the upper control limit. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

Surrogate recovery for the following samples was outside the upper control limit: WG22011-005, WG22011-006, WG22011-012. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: WG22011-007. The sample was also the batch duplicate and had concurring surrogate recoveries. Both sets of data have been reported.

Surrogate recovery for the following sample was outside control limits: WG22011-019. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: WG22011-004. This sample was also the batch duplicate with acceptable results. Both sets of data have been reported.

The MS/MSD associated with sample WG22011-012 had 6:2 FTS recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample Summary
Tetra Tech
Lot Number: WG22011
Project Name: NASA ARC PFAS
Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC24-W89-1-071921	Aqueous	07/19/2021 1210	07/22/2021
002	AOPC3-W7-3-071921	Aqueous	07/19/2021 1430	07/22/2021
003	AOPC3-W7-3-071921-FD	Aqueous	07/19/2021 1430	07/22/2021
004	AOPC3-W7-11-071921	Aqueous	07/19/2021 1545	07/22/2021
005	AOPC03-W7-13-071921	Aqueous	07/19/2021 1545	07/22/2021
006	AOPC03-UST-MW-02-071921	Aqueous	07/19/2021 1425	07/22/2021
007	AOPC21-W4-14-071921	Aqueous	07/19/2021 1735	07/22/2021
008	AOPC21-W6-6-071921	Aqueous	07/19/2021 1750	07/22/2021
009	FB-09-071921	Aqueous	07/19/2021 1600	07/22/2021
010	AOPC9-W2-13-072021	Aqueous	07/20/2021 1335	07/22/2021
011	AOPC21-W6-5-072021	Aqueous	07/20/2021 1410	07/22/2021
012	AOPC17,21-WU5-12-072021	Aqueous	07/20/2021 1420	07/22/2021
013	SWB-01-072021	Aqueous	07/20/2021 1430	07/22/2021
014	AOPC21-WU5-10-072021	Aqueous	07/20/2021 1540	07/22/2021
015	AOPC21-W4-6-072021	Aqueous	07/20/2021 1615	07/22/2021
016	FB-10-072021	Aqueous	07/20/2021 1650	07/22/2021
017	AOPC10-WGC2-13-072121	Aqueous	07/21/2021 0540	07/22/2021
018	AOPC10-WGC2-8-072121	Aqueous	07/21/2021 0545	07/22/2021
019	AOPC10-WGC2-10-072121	Aqueous	07/21/2021 0730	07/22/2021
020	AOPC10-WGC2-1-072121	Aqueous	07/21/2021 0740	07/22/2021
021	FB-11-072121	Aqueous	07/21/2021 1100	07/22/2021

(21 samples)

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG22011

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC24-W89-1-071921	94	114	91	89	93	87	84	93	95
AOPC24-W89-1-071921	85	101	94	72	75	81	79	88	86
AOPC3-W7-3-071921	83	105	82	76	78	75	86	85	85
AOPC3-W7-3-071921	93	84	94	74	81	82	81	87	86
AOPC3-W7-3-071921-FD	94	113	94	79	82	88	85	87	88
AOPC3-W7-3-071921-FD	84	135	87	73	77	92	81	95	88
AOPC3-W7-11-071921	80	96	69	59	61	67	68	71	73
AOPC3-W7-11-071921	85	128	92	74	69	98	75	97	91
AOPC03-W7-13-071921	165 *	106	88	80	78	90	89	94	93
AOPC03-W7-13-071921	110	138	98	79	84	99	82	102	92
AOPC03-UST-MW-02-071921	385 *	128	107	81	68	82	77	85	92
AOPC03-UST-MW-02-071921	370 *	188 *	130	70	64	100	82	92	94
AOPC21-W4-14-071921	278 *	226 *	166 *	79	62	73	73	71	57
AOPC21-W6-6-071921	102	103	84	91	89	85	88	89	94
AOPC21-W6-6-071921	105	135	106	88	87	105	93	102	98
FB-09-071921	80	99	81	81	79	81	89	86	84
AOPC9-W2-13-072021	93	79	92	81	82	83	79	82	79
AOPC21-W6-5-072021	86	99	78	77	80	77	84	84	83
AOPC17,21-WU5-12-072021	155 *	106	92	78	72	79	79	87	95
SWB-01-072021	86	112	86	76	75	77	78	80	83
AOPC21-WU5-10-072021	114	127	90	71	71	84	83	87	84
AOPC21-W4-6-072021	116	110	97	55	56	81	69	74	75
FB-10-072021	85	149	93	73	65	88	80	92	87
AOPC10-WGC2-13-072121	98	94	90	75	81	93	84	97	79
AOPC10-WGC2-8-072121	103	107	81	69	81	95	90	86	69
AOPC10-WGC2-10-072121	163 *	125	85	43 *	25 *	74	69	65	39 *
AOPC10-WGC2-1-072121	116	110	79	79	61	87	77	88	62
FB-11-072121	82	110	82	74	77	92	82	88	86
WQ10188-001	86	99	85	81	86	79	76	90	82
WQ10188-002	66	82	81	71	75	71	72	79	73

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG22011

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC21-W4-14-071921DUP	282 *	213 *	166 *	73	61	69	72	69	58
WQ10648-001	73	84	74	68	70	70	74	78	74
WQ10648-002	79	75	80	70	73	70	73	78	74
WQ10675-001	95	107	110	84	86	103	73	95	93
WQ10675-002	114	103	107	98	107	81	99	107	99
WQ10346-001	71	80	83	71	75	79	77	82	77
WQ10346-002	74	83	83	73	79	80	81	86	81
AOPC17,21-WU5-12-072021MS	155 *	95	86	74	74	80	75	84	92
AOPC17,21-WU5-12-072021MSD	100	90	92	72	78	82	83	82	85
WQ10452-001	95	134	109	96	103	81	90	102	94
WQ10452-002	82	90	87	72	77	86	80	88	83

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG22011

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC24-W89-1-071921	84	86	91	85	96	100	85	86	
AOPC24-W89-1-071921	85	82	88	82	74	94	79	85	
AOPC3-W7-3-071921	89	75	88	81	89	96	78	83	
AOPC3-W7-3-071921	89	82	82	81	71	93	83	91	
AOPC3-W7-3-071921-FD	85	78	87	83	86	95	87	86	
AOPC3-W7-3-071921-FD	89	79	81	79	86	95	79	90	
AOPC3-W7-11-071921	72	66	74	65	70	80	71	68	
AOPC3-W7-11-071921	93	93	86	78	83	100	87	90	
AOPC03-W7-13-071921	88	93	107	82	89	96	84	86	
AOPC03-W7-13-071921	95	91	88	91	90	101	84	87	
AOPC03-UST-MW-02-071921	90	102	110	88	90	90	73	84	
AOPC03-UST-MW-02-071921	95	103	104	82	93	99	83	97	
AOPC21-W4-14-071921	86	77	71	89	95	82	74	73	
AOPC21-W6-6-071921	92	86	94	81	88	97	84	90	
AOPC21-W6-6-071921	98	90	96	93	110	104	88	102	
FB-09-071921	89	78	86	81	80	88	85	78	
AOPC9-W2-13-072021	80	85	80	76	87	77	80	79	
AOPC21-W6-5-072021	81	85	83	73	84	88	80	75	
AOPC17,21-WU5-12-072021	85	93	98	75	81	87	79	80	
SWB-01-072021	82	82	77	77	87	89	75	79	
AOPC21-WU5-10-072021	83	82	76	73	84	87	82	92	
AOPC21-W4-6-072021	76	73	72	63	70	78	66	76	
FB-10-072021	87	79	79	77	79	101	79	85	
AOPC10-WGC2-13-072121	87	92	82	79	80	92	82	90	
AOPC10-WGC2-8-072121	82	83	80	74	83	88	79	92	
AOPC10-WGC2-10-072121	85	72	58	66	78	81	68	73	
AOPC10-WGC2-1-072121	88	77	74	67	73	85	69	83	
FB-11-072121	82	86	80	72	81	93	86	86	
WQ10188-001	86	77	83	83	89	98	80	81	
WQ10188-002	81	74	80	71	69	83	73	70	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG22011

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC21-W4-14-071921DUP	86	72	75	84	91	82	70	74	
WQ10648-001	76	72	78	74	71	78	66	75	
WQ10648-002	69	77	76	74	76	77	72	79	
WQ10675-001	88	86	86	88	92	93	85	96	
WQ10675-002	102	98	101	83	92	97	95	111	
WQ10346-001	85	80	80	77	76	78	82	77	
WQ10346-002	87	91	84	79	77	85	84	78	
AOPC17,21-WU5-12-072021MS	82	91	90	74	88	79	71	80	
AOPC17,21-WU5-12-072021MSD	82	84	84	77	85	80	76	84	
WQ10452-001	96	91	96	85	103	93	88	95	
WQ10452-002	81	73	76	71	86	85	78	84	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG22011

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC24-W89-1-071921	93	99	94						0
AOPC24-W89-1-071921	80	80	82						0
AOPC3-W7-3-071921	84	82	85						0
AOPC3-W7-3-071921	84	82	83						0
AOPC3-W7-3-071921-FD	88	91	94						0
AOPC3-W7-3-071921-FD	90	84	86						0
AOPC3-W7-11-071921	74	71	71						0
AOPC3-W7-11-071921	91	87	83						0
AOPC03-W7-13-071921	86	93	88						1
AOPC03-W7-13-071921	93	90	88						0
AOPC03-UST-MW-02-071921	94	106	87						1
AOPC03-UST-MW-02-071921	106	114	91						2
AOPC21-W4-14-071921	95	105	100						3
AOPC21-W6-6-071921	91	90	89						0
AOPC21-W6-6-071921	99	96	95						0
FB-09-071921	89	89	88						0
AOPC9-W2-13-072021	74	89	79						0
AOPC21-W6-5-072021	75	86	83						0
AOPC17,21-WU5-12-072021	74	90	105						1
SWB-01-072021	74	82	84						0
AOPC21-WU5-10-072021	83	83	81						0
AOPC21-W4-6-072021	79	65	69						0
FB-10-072021	87	85	79						0
AOPC10-WGC2-13-072121	89	85	86						0
AOPC10-WGC2-8-072121	86	85	83						0
AOPC10-WGC2-10-072121	79	63	69						4
AOPC10-WGC2-1-072121	83	73	70						0
FB-11-072121	87	86	71						0
WQ10188-001	90	87	88						0
WQ10188-002	78	74	73						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG22011

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC21-W4-14-071921DUP	89	108	101						3
WQ10648-001	75	77	73						0
WQ10648-002	76	79	72						0
WQ10675-001	93	91	88						0
WQ10675-002	101	100	96						0
WQ10346-001	77	79	79						0
WQ10346-002	78	83	78						0
AOPC17,21-WU5-12-072021MS	75	86	102						1
AOPC17,21-WU5-12-072021MSD	71	82	84						0
WQ10452-001	98	100	89						0
WQ10452-002	72	85	69						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

CLIENT SAMPLE ID

WQ10188-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG22011

Project No.: 103IG667601
Lab Sample ID: WQ10188-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/27/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/28/2021

Time Analyzed: 13:10

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC24-W89-1-071921	WG22011-001		17:26
AOPC3-W7-3-071921	WG22011-002		17:58
AOPC3-W7-3-071921-FD	WG22011-003		18:08
AOPC3-W7-11-071921	WG22011-004		18:19
AOPC03-W7-13-071921	WG22011-005		18:30
AOPC03-UST-MW-02-071921	WG22011-006		18:40
AOPC21-W4-14-071921	WG22011-007		18:51
AOPC21-W6-6-071921	WG22011-008		19:12
FB-09-071921	WG22011-009		19:23
WQ10188-002	WQ10188-002		13:21
AOPC21-W4-14-071921DUP	WG22011-007DU		19:01

PFAS by LC/MS/MS - MB

Sample ID: WQ10188-001
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/28/2021 1310
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/28/2021 1310

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		76	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10188-001
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		98	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10188-002
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	18		1	122	70-150	07/28/2021 1321
11Cl-PF3OUdS	15	18		1	117	70-150	07/28/2021 1321
8:2 FTS	15	15		1	101	67-138	07/28/2021 1321
6:2 FTS	15	15		1	99	64-140	07/28/2021 1321
4:2 FTS	15	21		1	143	63-143	07/28/2021 1321
GenX	32	36		1	113	70-150	07/28/2021 1321
ADONA	15	20		1	129	70-150	07/28/2021 1321
EtFOSAA	16	18		1	113	61-135	07/28/2021 1321
MeFOSAA	16	16		1	103	65-136	07/28/2021 1321
PFBS	14	18		1	124	72-130	07/28/2021 1321
PFDS	15	17		1	113	53-142	07/28/2021 1321
PFHpS	15	20		1	133	69-134	07/28/2021 1321
PFNS	15	17		1	109	69-127	07/28/2021 1321
PFOSA	16	19		1	122	67-137	07/28/2021 1321
PFPeS	15	20	N	1	134	71-127	07/28/2021 1321
PFHxS	15	18		1	122	68-131	07/28/2021 1321
PFBA	16	20		1	123	73-129	07/28/2021 1321
PFDA	16	19		1	120	71-129	07/28/2021 1321
PFDoA	16	20		1	127	72-134	07/28/2021 1321
PFHpA	16	19		1	119	72-130	07/28/2021 1321
PFHxA	16	19		1	118	72-129	07/28/2021 1321
PFNA	16	18		1	114	69-130	07/28/2021 1321
PFOA	16	19		1	118	71-133	07/28/2021 1321
PFPeA	16	18		1	114	72-129	07/28/2021 1321
PFTeDA	16	19		1	117	71-132	07/28/2021 1321
PFTrDA	16	23		1	141	65-144	07/28/2021 1321
PFUdA	16	20		1	124	69-133	07/28/2021 1321
PFOS	15	18		1	122	65-140	07/28/2021 1321

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		66	50-150
13C2_6:2FTS		82	50-150
13C2_8:2FTS		81	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		71	50-150
13C3_PFHxS		72	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		73	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		74	50-150
13C5_PFPeA		80	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10188-002
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		71	50-150
13C7_PFUdA		69	50-150
13C8_PFOA		83	50-150
13C8_PFOS		73	50-150
13C8_PFOSA		70	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		74	50-150
d3-MeFOSAA		73	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG22011-007DU
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	07/28/2021 1901
11Cl-PF3OUdS	ND	ND		1	0.00	20	07/28/2021 1901
8:2 FTS	ND	ND		1	0.00	20	07/28/2021 1901
6:2 FTS	14	13		1	11	20	07/28/2021 1901
4:2 FTS	ND	ND		1	0.00	20	07/28/2021 1901
GenX	ND	ND		1	0.00	20	07/28/2021 1901
ADONA	ND	ND		1	0.00	20	07/28/2021 1901
EtFOSAA	ND	ND		1	0.00	20	07/28/2021 1901
MeFOSAA	ND	ND		1	0.00	20	07/28/2021 1901
PFBS	13	15		1	13	20	07/28/2021 1901
PFDS	ND	ND		1	0.00	20	07/28/2021 1901
PFHpS	1.4	2.4	+	1	51	20	07/28/2021 1901
PFNS	ND	ND		1	0.00	20	07/28/2021 1901
PFOSA	ND	ND		1	0.00	20	07/28/2021 1901
PFPeS	5.4	5.4		1	0.37	20	07/28/2021 1901
PFHxS	67	66		1	2.3	20	07/28/2021 1901
PFBA	40	40		1	0.15	20	07/28/2021 1901
PFDA	2.5	2.5	J	1	1.1	20	07/28/2021 1901
PFDoA	ND	ND		1	0.00	20	07/28/2021 1901
PFHpA	8.5	8.9		1	5.6	20	07/28/2021 1901
PFHxA	20	21		1	1.7	20	07/28/2021 1901
PFNA	3.5	3.3	J	1	3.7	20	07/28/2021 1901
PFOA	60	52		1	15	20	07/28/2021 1901
PFPeA	12	ND		1	0.00	20	07/28/2021 1901
PFTeDA	ND	ND		1	0.00	20	07/28/2021 1901
PFTrDA	ND	ND		1	0.00	20	07/28/2021 1901
PFUdA	ND	ND		1	0.00	20	07/28/2021 1901
PFOS	70	74		1	6.6	20	07/28/2021 1901

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	282	50-150
13C2_6:2FTS	N	213	50-150
13C2_8:2FTS	N	166	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		61	50-150
13C3_PFBS		69	50-150
13C3_PFHxS		72	50-150
13C3-HFPO-DA		69	50-150
13C4_PFBA		58	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		72	50-150
13C5_PFPeA		75	50-150

NO ACTION, RESULTS ARE BELOW LOQ.

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG22011-007DU
Batch: 10188
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/27/2021 1619

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		82	50-150
13C8_PFOS		70	50-150
13C8_PFOSA		74	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		108	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

CLIENT SAMPLE ID

WQ10346-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG22011

Project No.: 103IG667601 Lab Sample ID: WQ10346-001

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2 Lab File ID:

Extraction Type: SOP SPE Date Extracted: 07/28/2021

LC Column: Gemini C18 ID: 2.00 (mm) Date Analyzed: 07/29/2021

Time Analyzed: 14:37

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC9-W2-13-072021	WG22011-010		19:25
AOPC21-W6-5-072021	WG22011-011		19:36
AOPC17,21-WU5-12-072021	WG22011-012		19:47
SWB-01-072021	WG22011-013		20:19
WQ10346-002	WQ10346-002		14:47
AOPC17,21-WU5-12-072021MS	WG22011-012MS		19:57
AOPC17,21-WU5-12-072021MSD	WG22011-012MD		20:08

PFAS by LC/MS/MS - MB

Sample ID: WQ10346-001
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/29/2021 1437
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/29/2021 1437

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		71	50-150
13C2_6:2FTS		80	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		77	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		77	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		80	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10346-001
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		77	50-150
13C7_PFUdA		76	50-150
13C8_PFOA		78	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		77	50-150
13C9_PFNA		77	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10346-002
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	111	70-150	07/29/2021 1447
11Cl-PF3OUdS	15	15		1	97	70-150	07/29/2021 1447
8:2 FTS	15	16		1	103	67-138	07/29/2021 1447
6:2 FTS	15	16		1	103	64-140	07/29/2021 1447
4:2 FTS	15	16		1	105	63-143	07/29/2021 1447
GenX	32	34		1	105	70-150	07/29/2021 1447
ADONA	15	18		1	118	70-150	07/29/2021 1447
EtFOSAA	16	17		1	108	61-135	07/29/2021 1447
MeFOSAA	16	20		1	123	65-136	07/29/2021 1447
PFBS	14	16		1	114	72-130	07/29/2021 1447
PFDS	15	19		1	123	53-142	07/29/2021 1447
PFHpS	15	17		1	110	69-134	07/29/2021 1447
PFNS	15	14		1	92	69-127	07/29/2021 1447
PFOSA	16	17		1	105	67-137	07/29/2021 1447
PFPeS	15	19		1	125	71-127	07/29/2021 1447
PFHxS	15	16		1	108	68-131	07/29/2021 1447
PFBA	16	19		1	117	73-129	07/29/2021 1447
PFDA	16	18		1	111	71-129	07/29/2021 1447
PFDoA	16	19		1	121	72-134	07/29/2021 1447
PFHpA	16	19		1	117	72-130	07/29/2021 1447
PFHxA	16	18		1	111	72-129	07/29/2021 1447
PFNA	16	19		1	116	69-130	07/29/2021 1447
PFOA	16	19		1	119	71-133	07/29/2021 1447
PFPeA	16	18		1	114	72-129	07/29/2021 1447
PFTeDA	16	19		1	116	71-132	07/29/2021 1447
PFTrDA	16	21		1	130	65-144	07/29/2021 1447
PFUdA	16	18		1	113	69-133	07/29/2021 1447
PFOS	15	16		1	109	65-140	07/29/2021 1447

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		74	50-150
13C2_6:2FTS		83	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		81	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10346-002
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		85	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		78	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		78	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG22011-012MS
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	16		1	112	70-150	07/30/2021 1957
11Cl-PF3OUdS	ND	14	14		1	100	70-150	07/30/2021 1957
8:2 FTS	ND	15	15		1	105	67-138	07/30/2021 1957
6:2 FTS	3.5	14	25	N	1	150	64-140	07/30/2021 1957
4:2 FTS	ND	14	15		1	109	63-143	07/30/2021 1957
GenX	ND	30	33		1	109	70-150	07/30/2021 1957
ADONA	ND	14	18		1	123	70-150	07/30/2021 1957
EtFOSAA	ND	15	16		1	107	61-135	07/30/2021 1957
MeFOSAA	ND	15	20		1	132	65-136	07/30/2021 1957
PFBS	ND	13	17		1	123	72-130	07/30/2021 1957
PFDS	ND	15	17		1	113	53-142	07/30/2021 1957
PFHpS	ND	14	18		1	126	69-134	07/30/2021 1957
PFNS	ND	15	18		1	125	69-127	07/30/2021 1957
PFOSA	1.2	15	16		1	100	67-137	07/30/2021 1957
PFPeS	ND	14	15		1	106	71-127	07/30/2021 1957
PFHxS	2.1	14	18		1	113	68-131	07/30/2021 1957
PFBA	3.3	15	20		1	113	73-129	07/30/2021 1957
PFDA	ND	15	18		1	118	71-129	07/30/2021 1957
PFDoA	ND	15	18		1	117	72-134	07/30/2021 1957
PFHpA	ND	15	17		1	113	72-130	07/30/2021 1957
PFHxA	1.7	15	19		1	111	72-129	07/30/2021 1957
PFNA	ND	15	17		1	115	69-130	07/30/2021 1957
PFOA	1.8	15	20		1	123	71-133	07/30/2021 1957
PFPeA	1.4	15	19		1	114	72-129	07/30/2021 1957
PFTeDA	ND	15	17		1	110	71-132	07/30/2021 1957
PFTrDA	ND	15	19		1	128	65-144	07/30/2021 1957
PFUdA	ND	15	16		1	104	69-133	07/30/2021 1957
PFOS	ND	14	16		1	115	65-140	07/30/2021 1957

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	155	50-150
13C2_6:2FTS		95	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG22011-012MS
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		74	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		79	50-150
13C8_PFOS		71	50-150
13C8_PFOSA		80	50-150
13C9_PFNA		75	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		102	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG22011-012MD
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	14	15		1	106	8.6	70-150	30	07/30/2021 2008
11Cl-PF3OUdS	ND	14	14		1	103	0.21	70-150	30	07/30/2021 2008
8:2 FTS	ND	14	15		1	104	3.8	67-138	30	07/30/2021 2008
6:2 FTS	3.5	14	15	+	1	84	48	64-140	30	07/30/2021 2008
4:2 FTS	ND	14	15		1	107	4.1	63-143	30	07/30/2021 2008
GenX	ND	30	33		1	111	0.86	70-150	30	07/30/2021 2008
ADONA	ND	14	16		1	111	13	70-150	30	07/30/2021 2008
EtFOSAA	ND	15	15		1	98	11	61-135	30	07/30/2021 2008
MeFOSAA	ND	15	19		1	131	3.1	65-136	30	07/30/2021 2008
PFBS	ND	13	14		1	108	15	72-130	30	07/30/2021 2008
PFDS	ND	14	16		1	113	2.8	53-142	30	07/30/2021 2008
PFHpS	ND	14	15		1	108	17	69-134	30	07/30/2021 2008
PFNS	ND	14	16		1	114	12	69-127	30	07/30/2021 2008
PFOSA	1.2	15	16		1	98	4.1	67-137	30	07/30/2021 2008
PFPeS	ND	14	15		1	109	0.17	71-127	30	07/30/2021 2008
PFHxS	2.1	13	17		1	114	2.2	68-131	30	07/30/2021 2008
PFBA	3.3	15	17		1	95	16	73-129	30	07/30/2021 2008
PFDA	ND	15	18		1	119	1.7	71-129	30	07/30/2021 2008
PFDoA	ND	15	18		1	122	1.9	72-134	30	07/30/2021 2008
PFHpA	ND	15	15		1	100	15	72-130	30	07/30/2021 2008
PFHxA	1.7	15	17		1	101	11	72-129	30	07/30/2021 2008
PFNA	ND	15	18		1	124	5.3	69-130	30	07/30/2021 2008
PFOA	1.8	15	19		1	117	6.3	71-133	30	07/30/2021 2008
PFPeA	1.4	15	17		1	102	12	72-129	30	07/30/2021 2008
PFTeDA	ND	15	16		1	109	4.0	71-132	30	07/30/2021 2008
PFTrDA	ND	15	21		1	141	7.1	65-144	30	07/30/2021 2008
PFUdA	ND	15	16		1	110	2.9	69-133	30	07/30/2021 2008
PFOS	ND	14	17		1	121	3.1	65-140	30	07/30/2021 2008

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS - MSD

Sample ID: WG22011-012MD
Batch: 10346
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/28/2021 1734

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		77	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		80	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		71	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

CLIENT SAMPLE ID

WQ10452-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG22011

Project No.: 103IG667601
Lab Sample ID: WQ10452-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex 4500_LCMSMS1
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/29/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 08/04/2021

Time Analyzed: 18:03

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC21-WU5-10-072021	WG22011-014		12:43
AOPC21-W4-6-072021	WG22011-015		12:54
FB-10-072021	WG22011-016		13:04
AOPC10-WGC2-13-072121	WG22011-017		13:36
AOPC10-WGC2-8-072121	WG22011-018		13:47
AOPC10-WGC2-10-072121	WG22011-019		13:57
AOPC10-WGC2-1-072121	WG22011-020		14:08
FB-11-072121	WG22011-021		14:18
WQ10452-002	WQ10452-002		12:33

PFAS by LC/MS/MS - MB

Sample ID: WQ10452-001
Batch: 10452
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1100

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/04/2021 1803
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/04/2021 1803

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		134	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		103	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10452-001
Batch: 10452
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1100

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	50-150
13C7_PFUdA		103	50-150
13C8_PFOA		93	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		89	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10452-002
Batch: 10452
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1100

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	110	70-150	08/03/2021 1233
11Cl-PF3OUdS	15	15		1	100	70-150	08/03/2021 1233
8:2 FTS	15	15		1	100	67-138	08/03/2021 1233
6:2 FTS	15	14		1	90	64-140	08/03/2021 1233
4:2 FTS	15	18		1	121	63-143	08/03/2021 1233
GenX	32	46		1	143	70-150	08/03/2021 1233
ADONA	15	18		1	118	70-150	08/03/2021 1233
EtFOSAA	16	17		1	106	61-135	08/03/2021 1233
MeFOSAA	16	20		1	125	65-136	08/03/2021 1233
PFBS	14	16		1	110	72-130	08/03/2021 1233
PFDS	15	18		1	118	53-142	08/03/2021 1233
PFHpS	15	17		1	109	69-134	08/03/2021 1233
PFNS	15	14		1	94	69-127	08/03/2021 1233
PFOSA	16	17		1	108	67-137	08/03/2021 1233
PFPeS	15	18		1	120	71-127	08/03/2021 1233
PFHxS	15	15		1	104	68-131	08/03/2021 1233
PFBA	16	17		1	109	73-129	08/03/2021 1233
PFDA	16	17		1	105	71-129	08/03/2021 1233
PFDoA	16	17		1	108	72-134	08/03/2021 1233
PFHpA	16	14		1	89	72-130	08/03/2021 1233
PFHxA	16	19		1	117	72-129	08/03/2021 1233
PFNA	16	21		1	130	69-130	08/03/2021 1233
PFOA	16	17		1	109	71-133	08/03/2021 1233
PFPeA	16	17		1	105	72-129	08/03/2021 1233
PFTeDA	16	17		1	108	71-132	08/03/2021 1233
PFTrDA	16	16		1	99	65-144	08/03/2021 1233
PFUdA	16	17		1	107	69-133	08/03/2021 1233
PFOS	15	15		1	102	65-140	08/03/2021 1233

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		82	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		73	50-150
13C5_PFPeA		76	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10452-002
Batch: 10452
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1100

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		71	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		85	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		72	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		69	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

CLIENT SAMPLE ID

WQ10648-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG22011

Project No.: 103IG667601
Lab Sample ID: WQ10648-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/30/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/31/2021

Time Analyzed: 16:26

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC24-W89-1-071921	WG22011-001		17:22
AOPC3-W7-3-071921	WG22011-002		17:32
WQ10648-002	WQ10648-002		16:37

PFAS by LC/MS/MS - MB

Sample ID: WQ10648-001
Batch: 10648
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/30/2021 1838

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1626

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		73	50-150
13C2_6:2FTS		84	50-150
13C2_8:2FTS		74	50-150
13C2_PFDoA		68	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		70	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		74	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		72	50-150
13C5_PFPeA		78	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		71	50-150
13C8_PFOA		78	50-150
13C8_PFOS		66	50-150
13C8_PFOSA		75	50-150
13C9_PFNA		75	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		73	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10648-002
Batch: 10648
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/30/2021 1838

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
PFPeS	15	15		1	102	71-127	07/31/2021 1637

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		79	50-150
13C2_6:2FTS		75	50-150
13C2_8:2FTS		80	50-150
13C2_PFDoA		70	50-150
13C2_PFTeDA		73	50-150
13C3_PFBS		70	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		74	50-150
13C4_PFHpA		69	50-150
13C5_PFHxA		77	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		74	50-150
13C7_PFUdA		76	50-150
13C8_PFOA		77	50-150
13C8_PFOS		72	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		76	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		72	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

CLIENT SAMPLE ID

WQ10675-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG22011

Project No.: 103IG667601
Lab Sample ID: WQ10675-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex 4500_LCMSMS1
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/31/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 08/03/2021

Time Analyzed: 10:47

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC3-W7-3-071921-FD	WG22011-003		11:08
AOPC3-W7-11-071921	WG22011-004		11:18
AOPC03-W7-13-071921	WG22011-005		11:29
AOPC03-UST-MW-02-071921	WG22011-006		11:39
AOPC21-W6-6-071921	WG22011-008		11:50
WQ10675-002	WQ10675-002		17:53

NOT USED IN DATA VALIDATION

PFAS by LC/MS/MS - MB

Sample ID: WQ10675-001
Batch: 10675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2021 1209

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/03/2021 1047
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/03/2021 1047

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		73	50-150
13C3-HFPO-DA		95	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10675-001
Batch: 10675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2021 1209

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		96	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10675-002
Batch: 10675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2021 1209

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	94	70-150	08/04/2021 1753
11Cl-PF3OUdS	15	15		1	100	70-150	08/04/2021 1753
8:2 FTS	15	15		1	96	67-138	08/04/2021 1753
6:2 FTS	15	52	N	1	340	64-140	08/04/2021 1753
4:2 FTS	15	14		1	92	63-143	08/04/2021 1753
GenX	32	31		1	98	70-150	08/04/2021 1753
ADONA	15	15		1	102	70-150	08/04/2021 1753
EtFOSAA	16	14		1	90	61-135	08/04/2021 1753
MeFOSAA	16	15		1	94	65-136	08/04/2021 1753
PFBS	14	17		1	121	72-130	08/04/2021 1753
PFDS	15	16		1	101	53-142	08/04/2021 1753
PFHpS	15	15		1	99	69-134	08/04/2021 1753
PFNS	15	15		1	99	69-127	08/04/2021 1753
PFOSA	16	14		1	90	67-137	08/04/2021 1753
PFPeS	15	19	N	1	129	71-127	08/04/2021 1753
PFHxS	15	15		1	100	68-131	08/04/2021 1753
PFBA	16	17		1	103	73-129	08/04/2021 1753
PFDA	16	18		1	113	71-129	08/04/2021 1753
PFDoA	16	17		1	103	72-134	08/04/2021 1753
PFHpA	16	16		1	101	72-130	08/04/2021 1753
PFHxA	16	16		1	102	72-129	08/04/2021 1753
PFNA	16	17		1	108	69-130	08/04/2021 1753
PFOA	16	15		1	94	71-133	08/04/2021 1753
PFPeA	16	14		1	90	72-129	08/04/2021 1753
PFTeDA	16	15		1	94	71-132	08/04/2021 1753
PFTrDA	16	16		1	100	65-144	08/04/2021 1753
PFUdA	16	19		1	121	69-133	08/04/2021 1753
PFOS	15	16		1	106	65-140	08/04/2021 1753

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		114	50-150
13C2_6:2FTS		103	50-150
13C2_8:2FTS		107	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		107	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		107	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10675-002
Batch: 10675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2021 1209

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		97	50-150
13C8_PFOS		95	50-150
13C8_PFOSA		111	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821035.d		
Injection Date:	28-Jul-2021 17:58:05	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	28
Lab Sample ID:	WG22011-002	Lab Prep. Batch:	10188
Client ID:	AOPC3-W7-3-071921	Sample Group:	WG22011
Sample Info:	WG22011-002	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Final Conc.:	Amt * DF * CF	Matrix/Level:	Aqueous

Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0402528

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	273	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.712	0	467021	18	>100:1			1001.00	846.98	85.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.712	0/0	136687	20	>100:1			303.82	12.230		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	0	443422	15	>100:1			1001.00	858.78	88	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	0	133926	14	>100:1			1001.00	771.61	74.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	0/0	34084	15	>100:1	Target = 3.51		197.03	7.9312		
298.9 > 99	44	2.141	2.141		11271	16	84:1	3.02 (1.75-5.27)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.487	2.487	0/0	14336	12	90:1	Target = 2.74		114.64	4.6146		
349 > 99	44	2.487	2.487		3261	13	39:1	4.39 (1.37-4.11)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.416	0	78311	15	>100:1			5005.00	3928.15	83.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.451	0	472652	16	>100:1			1001.00	783.75	75.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													J
313 > 269	49	2.451	2.451	0/0	17443	13	17:1	Target = 19.67		36.138	1.4547		M
313 > 119	49	2.469	2.451		1164	21	8.0:1	14.98 (9.83-29.50)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.567	2.567	0	1012089	15	>100:1			5005.00	4752.24	85.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.575		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.827	0	428656	16	>100:1			1001.00	883.85	89	

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821038.d		
Injection Date:	28-Jul-2021 18:30:02	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	31
Lab Sample ID:	WG22011-005	Lab Prep. Batch:	10188
Client ID:	AOPC03-W7-13-071921	Sample Group:	WG22011
Sample Info:	WG22011-005	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Final Conc.:	Amt * DF * CF	Matrix/Level:	Aqueous

Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0385579

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	285	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.712	0	509536	19	>100:1			1001.00	924.09	93.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.712	0/0	137468	20	>100:1			280.06	10.799		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	0	540805	16	>100:1			1001.00	1047.39	107.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													J
262.9 > 218.9	50	2.088	2.088	0/0	17916	12	30:1			31.247	1.2048		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	0	160866	15	>100:1			1001.00	926.83	89.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	0/0	41121	14	95:1	Target = 3.51		197.90	7.6308		
298.9 > 99	44	2.141	2.141		12385	16	>100:1	3.32 (1.75-5.27)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													J
349 > 80	44	2.487	2.487	0/0	12511	12	94:1	Target = 2.74		83.292	3.2116		
349 > 99	44	2.487	2.487		6464	21	44:1	1.93 (1.37-4.11)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.416	0	155698	16	>100:1			5005.00	7809.95	165.2*	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.451	0	582134	16	>100:1			1001.00	965.29	92.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													J
313 > 269	49	2.451	2.451	0/0	32145	14	36:1	Target = 19.67		54.073	2.0849		M
313 > 119	49	2.460	2.451		2498	17	45:1	12.86 (9.83-29.50)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.567	2.567	0	1112167	17	>100:1			5005.00	5222.16	93.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.575		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.827	0	424049	15	>100:1			1001.00	874.35	88.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													J
363 > 319	47	2.827	2.827	0/0	25833	17	41:1	Target = 3.69		54.378	2.0967		
363 > 169	47	2.827	2.827		8050	13	58:1	3.20 (1.84-5.53)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.846	0	130153	15	>100:1			1001.00	937.15	88.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.846	0/0	129633	32	>100:1	Target = 3.05	0.20	931.03	35.899		
399 > 99	45	2.845	2.846		37209	24	>100:1	3.48 (1.52-4.57)	0.17				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.864		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.213		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.187	0	87634	21	>100:1			5005.00	5587.92	106.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.187	0/0	263611	21	>100:1	Target = 1.82		5337.99	205.82		
427 > 81	64	3.181	3.187		151044	20	>100:1	1.74 (0.91-2.73)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.213	0	451152	20	>100:1			1001.00	911.86	95.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.207	1/1	186488	34	>100:1	Target = 2.88	0.08	435.81	16.804		
413 > 169	53	3.214	3.207		67566	34	>100:1	2.76 (1.44-4.32)	0.18				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.584	1	122082	18	>100:1			1001.00	876.55	84.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.584	1/0	107250	34	82:1	Target = 3.41		786.41	30.322		M
499 > 99	54	3.585	3.584		31298	34	>100:1	3.42 (1.70-5.12)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.796		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.935		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.235		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.396		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.593	3.592	1	506684	18	>100:1			1001.00	831.73	85.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													J
463 > 419	56	3.593	3.592	1/0	22021	19	41:1	Target = 6.36		41.294	1.5922		
463 > 169	56	3.577	3.592		2029	13	8.8:1	10.85 (3.18-9.54)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.879	3.885	0	265936	18				1001.00	996.09	86.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													J
498 > 78	55	3.871	3.885	0/0	6869	15	15:1	Target = 28.47		24.202	0.93319		M
498>478	55	3.887	3.885		198	15		34.69 (14.23-42.70)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.928	3.935	0	80968	23	>100:1			5005.00	4783.62	87.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.935		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.937	3.943	0	499770	18	>100:1			1001.00	847.27	81.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.943		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.105	0	603178	16	>100:1			5005.00	4518.71	88	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.114		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.247	4.255	0	548972	15	>100:1			1001.00	835.73	88.9	

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821039.d		
Injection Date:	28-Jul-2021 18:40:36	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	32
Lab Sample ID:	WG22011-006	Lab Prep. Batch:	10188
Client ID:	AOPC03-UST-MW-02-071921	Sample Group:	WG22011
Sample Info:	WG22011-006	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Final Conc.:	Amt * DF * CF	Matrix/Level:	Aqueous

Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0422654

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	260	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.731	1.712	2	502674	16	>100:1			1001.00	911.64	92	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.731	1.712	2/0	201250	24	20:1			415.61	17.566		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.088	-1	553525	15	>100:1			1001.00	1072.02	109.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.067	2.088	-1/0	70530	11	11:1			120.18	5.0796		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.141	-1	146531	15	>100:1			1001.00	844.24	81.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.141	-1/0	57951	18	61:1	Target = 3.51		306.19	12.941		
298.9 > 99	44	2.120	2.141		15476	14	55:1	3.74 (1.75-5.27)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.425	2.487	-3/-2	18207	11	37:1	Target = 2.74		133.07	5.6243		
349 > 99	44	2.425	2.487		7466	12	38:1	2.43 (1.37-4.11)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.362	2.416	-3	363013	14	>100:1			5005.00	18209	385.2*	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.398	2.451	-3	644046	15	>100:1			1001.00	1067.95	102.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													J
313 > 269	49	2.398	2.451	-3/0	50703	13	18:1	Target = 19.67		77.091	3.2583		
313 > 119	49	2.398	2.451		3608	13	29:1	14.05 (9.83-29.50)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.505	2.567	-3	1003339	17	>100:1			5005.00	4711.16	84.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.575		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.746	2.827	-4	432819	15	>100:1			1001.00	892.44	89.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													J
363 > 319	47	2.746	2.827	-4/0	32855	13	28:1	Target = 3.69		67.758	2.8638		
363 > 169	47	2.755	2.827		9542	14	29:1	3.44 (1.84-5.53)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.755	2.846	-5	113087	17	>100:1			1001.00	814.27	77.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.755	2.846	-5/0	164497	24	>100:1	Target = 3.05	0.16	1359.72	57.469		
399 > 99	45	2.755	2.846		44861	24	>100:1	3.66 (1.52-4.57)	0.15				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.864		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													J
449 > 80	45	3.140	3.213	-4/1	3686	19	40:1	Target = 3.06		33.266	1.4060		
449 > 99	45	3.133	3.213		983	14	11:1	3.74 (1.53-4.59)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.100	3.187	-5	105203	22	>100:1			5005.00	6708.19	127.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.100	3.187	-5/0	401352	21	>100:1	Target = 1.82		6769.93	286.13		
427 > 81	64	3.107	3.187		221595	23	>100:1	1.81 (0.91-2.73)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.127	3.213	-5	424684	20	>100:1			1001.00	858.36	90.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.127	3.207	-4/1	157255	31	>100:1	Target = 2.88		390.40	16.500		M
413 > 169	53	3.127	3.207		56243	37	>100:1	2.79 (1.44-4.32)	0.14				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.506	3.584	-4	106192	25	>100:1			1001.00	762.46	73.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.506	3.584	-4/0	138794	40	>100:1	Target = 3.41	0.91	1178.57	49.813		
499 > 99	54	3.514	3.584		38280	36	>100:1	3.62 (1.70-5.12)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.796		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.935		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.235		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.396		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.514	3.592	-4	553713	18	>100:1			1001.00	908.93	93.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													Ja
463 > 419	56	3.521	3.592	-4/0	15585	18	17:1	Target = 6.36		26.743	1.1303		
463 > 169	56	3.499	3.592		1846	11	9.1:1	8.44 (3.18-9.54)					M
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.812	3.885	-4	257185	17	>100:1			1001.00	963.32	83.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.885		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.861	3.935	-4	98792	17	>100:1			5005.00	5836.67	107.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.935		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.869	3.943	-4	537629	18	>100:1			1001.00	911.46	88	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													J
513 > 469	51	3.869	3.943	-4/0	16582	17	18:1	Target = 13.35		28.967	1.2243		
513 > 169	51	3.869	3.943		1900	21	13:1	8.72 (6.67-20.03)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.025	4.105	-4	595931	17	>100:1			5005.00	4464.42	87	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.114		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.176	4.255	-4	552850	16	>100:1			1001.00	841.64	89.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.255		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.185	4.255	-4	678815	16	>100:1			5005.00	5906.32	106.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.265		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.444	4.533	-5	514659	17	>100:1			1001.00	693.21	81.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													J
613 > 569	38	4.444	4.533	-5/0	16907	17	32:1	Target = 10.01		32.464	1.3721		
613 > 169	38	4.444	4.533		1064	16		15.89 (5.00-15.02)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.774		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.883	4.991	-6	537908	16	>100:1			1001.00	614.73	67.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.991		ND								
*** 37 13C2_PFDA**													
515 > 470		3.869	3.943	-4	791198	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.398	2.451	-3	791337	14	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.127	3.213	-5	574378	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.731	1.712	2	597009	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.514	3.584	-4	165275	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit
J - Compound Concentration Below Quantitation Limit
M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\073021-DOD.b\073021044.d		
Injection Date:	30-Jul-2021 19:47:04	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	37
Lab Sample ID:	WG22011-012	Lab Prep. Batch:	10346
Client ID:	AOPC17,21-WU5-12-072021	Sample Group:	WG22011
Sample Info:	WG22011-012	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Final Conc.:	Amt * DF * CF	Matrix/Level:	Aqueous

Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0408513

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	269	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.717	1	529023	18	>100:1			1001.00	959.43	94.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													J
212.9 > 168.9	46	1.718	1.723	0/-1	40555	21	12:1			79.579	3.2509		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.099	2.098	1	548240	14	>100:1			1001.00	1061.79	98.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													J
262.9 > 218.9	50	2.099	2.098	1/0	20603	11	13:1			35.446	1.4480		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.150	1	148301	14	>100:1			1001.00	854.43	78.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.150		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.495		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.425	2.424	1	152888	17	>100:1			5005.00	7668.99	155.3*	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.424		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.459	1	562041	16	>100:1			1001.00	931.97	92.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													J
313 > 269	49	2.469	2.468	1/0	23474	13	23:1	Target = 19.67		40.898	1.6708		
313 > 119	49	2.460	2.468		2017	24	10:1	11.63 (9.83-29.50)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.583	2.574	1	1059841	17	>100:1			5005.00	4976.46	86.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.582		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.835	1	419996	16	>100:1			1001.00	866.00	84.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.844		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.855	2.854	1	117246	18	>100:1			1001.00	844.21	79.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													J
399 > 80	45	2.864	2.854	1/0	6314	25	17:1	Target = 3.05	0.65	50.340	2.0564		
399 > 99	45	2.864	2.854		2114	30	18:1	2.98 (1.52-4.57)	0.51				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.872		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.225		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.201	3.198	1	94519	22	>100:1			5005.00	6026.94	106.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													J
427 > 407	64	3.194	3.198	0/-1	4607	14	50:1	Target = 1.82		86.494	3.5334		M
427 > 81	64	3.201	3.198		3177	19	17:1	1.45 (0.91-2.73)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.228	3.225	1	451741	20	>100:1			1001.00	913.05	87.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													J
413 > 369	53	3.228	3.225	1/0	18934	25	12:1	Target = 2.88		44.190	1.8052		M
413 > 169	53	3.221	3.225		5971	30	35:1	3.17 (1.44-4.32)	0.14				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.601	3.598	1	120497	22	>100:1			1001.00	865.17	78.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.598		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.803		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.942		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.252		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.408		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.609	3.606	1	494875	19	>100:1			1001.00	812.35	74.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.606		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.896	3.893	1	260897	17				1001.00	977.22	79.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													J
498 > 78	55	3.896	3.893	1/0	8450	21	70:1	Target = 28.47		30.348	1.2398		
498>478	55	3.896	3.893		128	13		66.01 (14.23-42.70)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.946	3.951	0	87841	18	>100:1			5005.00	5189.68	92	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.934		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.955	3.951	1	477659	17	>100:1			1001.00	809.79	74.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.960		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.116	4.111	1	737500	17	>100:1			5005.00	5524.99	105	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.111		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.268	4.262	1	482938	15	>100:1			1001.00	735.20	80.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.272		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.268	4.272	0	571298	15	>100:1			5005.00	4970.82	90	

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47	072221B017.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24	072221B018.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59	072221B019.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35	072221B020.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15	072221B021.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49	072221B022.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27	072221B023.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08	072221B024.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44	072221B025.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22	072221B026.d	ICal					Analytes	L-10	1.00		
11	ID IBLK A	23-Jul-2021 01:04:03	072221B027.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1577	23-Jul-2021 01:14:35	072221B028.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK STD_SVLC-1562	23-Jul-2021 01:25:08	072221B029.d	CheckStd					IsomerCheck	Smp	1.00		

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.613	3.212	3.254	3.512	3.519	3.439	3.450	3.423	3.453	3.406	3.428	3.170-3.867	0.11611	1.759
1 4:2 FTS	0.893	1.026	1.353	1.771	1.666	1.969	1.808	1.978	1.879	1.975	1.631	0.377-2.954	0.42965	0.833
15 PFHxA	14.031	13.128	25.058	19.778	19.670	18.684	18.332	17.826	18.587	16.968	18.206	10.298-29.041	3.12369	9.835
22 PFPeS	3.236	2.899	3.017	3.131	2.741	3.011	2.863	2.861	2.937	3.054	2.975	2.313-3.168	0.14244	1.370
28 GenX	0.743	0.771	0.796	0.756	0.792	0.778	0.802	0.762	0.801	0.801	0.780	0.730-0.853	0.02047	0.396
13 PFHpA	3.729	3.626	4.038	3.688	3.691	3.699	3.761	3.747	3.689	3.615	3.728	3.329-4.052	0.12053	1.845
14 PFHxS	3.013	2.850	2.943	2.837	3.053	3.270	3.250	3.163	2.987	3.051	3.041	2.597-3.508	0.15168	1.526
29 ADONA	3.008	2.930	3.121	3.020	3.078	3.024	3.133	2.998	3.054	2.887	3.025	2.823-3.332	0.08492	1.539
2 6:2 FTS	Disabled	1.603	1.602	1.986	1.824	1.966	1.821	1.888	1.888	1.794	1.819	1.414-2.233	0.13649	0.912
20 PFOA	2.682	3.014	2.640	3.017	2.883	2.685	2.898	2.853	3.040	2.880	2.859	2.421-3.344	0.15393	1.441
12 PFHpS	2.754	3.053	3.578	3.274	3.062	3.160	3.143	2.970	3.104	2.957	3.105	2.405-3.718	0.21869	1.531
18 PFOS	3.458	3.004	3.025	3.387	3.415	3.427	3.449	3.289	3.288	3.372	3.311	2.828-4.001	0.19534	1.707
17 PFNA	7.315	6.232	6.097	6.165	6.365	6.364	6.419	6.205	6.468	6.017	6.364	5.200-7.529	0.38823	3.182
19 PFOSA	69.990	52.330	34.668	27.726	28.473	32.713	32.270	32.526	30.906	30.582	37.218	-13.074-70.020	13.84911	14.236
16 PFNS	2.370	2.991	3.315	2.530	2.513	2.612	2.708	2.741	2.805	2.756	2.734	1.730-3.295	0.26096	1.256
10 PFDA	10.069	14.382	13.280	14.604	13.356	13.003	13.142	12.930	12.566	12.724	13.005	9.699-17.012	1.21871	6.678
3 8:2 FTS	1.577	1.517	1.982	1.945	1.968	2.064	1.988	1.857	1.848	2.011	1.875	1.329-2.606	0.21297	0.984
6 N-MeFOSAA	1.729	1.368	1.209	1.297	1.452	1.386	1.421	1.374	1.370	1.373	1.397	1.020-1.883	0.14393	0.726
9 PFDS	2.989	2.117	3.337	2.261	2.618	2.535	2.720	Disabled	Disabled	Disabled	2.653	1.432-3.803	0.39506	1.309
25 PFUdA	10.186	13.794	12.360	14.609	14.700	13.886	13.538	13.848	14.326	13.899	13.514	10.475-18.924	1.40814	7.350
5 N-EtFOSAA	3.441	1.648	1.914	1.385	1.447	1.704	1.510	1.704	1.566	1.711	1.803	-0.278-3.172	0.57502	0.723
26 MeFOSA	0.872	1.060	0.983	1.222	1.013	0.982	0.996	1.118	1.006	1.027	1.027	0.729-1.296	0.09451	0.506
27 EtFOSA	0.899	1.138	0.928	0.907	0.893	1.061	0.960	0.948	1.053	0.994	0.978	0.635-1.150	0.08599	0.446
11 PFDoA	17.404	11.511	9.422	10.673	10.018	10.373	10.714	10.193	10.249	10.510	11.106	3.257-16.778	2.25341	5.009
4 10:2 FTS	3.256	1.775	3.770	3.333	3.196	3.666	3.304	3.478	3.467	3.512	3.275	1.509-4.882	0.56222	1.598
34 PFDOS	3.580	2.776	3.093	2.779	3.093	3.074	2.931	3.077	3.134	3.223	3.076	2.399-3.786	0.23104	1.546
24 PFTrDA	8.158	8.335	8.011	7.623	8.030	7.860	7.857	8.081	8.143	7.615	7.971	7.303-8.756	0.24220	4.015
23 PFTeDA	11.812	12.137	10.917	11.359	11.304	11.364	11.381	11.748	11.166	10.899	11.408	10.099-12.508	0.40138	5.652
35 PFHxDA	11.601	11.103	9.130	10.834	10.453	10.404	10.497	10.396	10.280	10.369	10.506	8.526-12.379	0.64207	5.226
36 PFODA	14.446	12.290	13.663	13.457	13.351	13.158	13.254	13.055	12.911	12.657	13.224	11.594-15.107	0.58536	6.675

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	547	611	600	573	563	559	541	472	515	533	Avg:A Wt:C2	551		RSD=7.3	
	99.2	110.8	108.8	103.9	102.1	101.4	98	85.7	93.5	96.6	Org:N Dep:R				
8 PFBA	1.016419	1.005008	0.969197	0.979269	0.877172	0.939182	0.971835	0.977893	0.961911	0.944904	Avg:A Wt:C2	0.964279		RSD=4.0	
	105.4	104.2	100.5	101.6	91	97.4	100.8	101.4	99.8	98	Org:N Dep:R				
D 50 13C5_PFPeA	511	576	552	532	524	535	519	439	481	495	Avg:A Wt:C2	516		RSD=7.4	
	99	111.5	106.8	103	101.4	103.7	100.6	85	93.2	95.8	Org:N Dep:R				
21 PFPeA	1.142375	1.109055	1.059827	1.048168	0.941090	1.070071	1.082590	1.082854	1.057405	1.019366	Avg:A Wt:C2	1.061280		RSD=5.1	
	107.6	104.5	99.9	98.8	88.7	100.8	102	102	99.6	96.1	Org:N Dep:R				
D 44 13C3_PFBS	169	196	188	179	169	176	182	140	164	172	Avg:A Wt:C2	174		RSD=8.8	
	97.1	113.1	108.2	103	97.5	101.6	105.1	80.7	94.3	99.3	Org:N Dep:R				
7 PFBS	1.381732	1.255550	1.302964	1.288405	1.228942	1.263662	1.236027	1.381835	1.313330	1.276973	Avg:A Wt:C2	1.292942		RSD=4.2	
	106.9	97.1	100.8	99.6	95.1	97.7	95.6	106.9	101.6	98.8	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 63 13C2_4:2 FTS_2	20.0656	22.1628	21.5058	21.9484	18.0392	19.9862	19.3008	17.9994	18.5994	19.7510	Avg:A Wt:C2	19.9359		RSD=7.7	
	100.7	111.2	107.9	110.1	90.5	100.3	96.8	90.3	93.3	99.1	Org:N Dep:R				
1 4:2 FTS	1.969984	2.018352	1.754668	1.950750	2.148070	2.269259	2.125729	1.914512	1.994807	2.055682	Avg:A Wt:C2	2.020181		RSD=7.0	
	97.5	99.9	86.9	96.6	106.3	112.3	105.2	94.8	98.7	101.8	Org:N Dep:R				
D 49 13C5_PFHxA	606	659	647	645	600	624	619	499	541	589	Avg:A Wt:C2	603		RSD=8.3	
	100.5	109.3	107.3	107	99.5	103.5	102.6	82.8	89.7	97.7	Org:N Dep:R				
15 PFHxA	1.136456	0.970051	1.105495	1.009838	0.939058	1.016957	0.974863	1.065629	1.065952	0.937937	Avg:A Wt:C2	1.022224		RSD=6.8	
	111.2	94.9	108.1	98.8	91.9	99.5	95.4	104.2	104.3	91.8	Org:N Dep:R				
22 PFPeS	1.040990	0.872468	0.901285	0.964537	0.925005	0.938154	0.879388	0.995855	0.895449	0.933551	Avg:A Wt:C2	0.934668		RSD=5.7	
	111.4	93.3	96.4	103.2	99	100.4	94.1	106.5	95.8	99.9	Org:N Dep:R				
28 GenX	0.694514	0.706749	0.711356	0.656646	0.698709	0.700657	0.679510	0.647892	0.680289	0.709347	Avg:A Wt:C2	0.688567		RSD=3.2	
	100.9	102.6	103.3	95.4	101.5	101.8	98.7	94.1	98.8	103	Org:N Dep:R				
D 66 13C3_GenX	212	240	236	225	200	208	215	190	206	198	Avg:A Wt:C2	213		RSD=7.7	
	99.6	112.8	110.8	105.5	94	97.4	100.7	89.4	96.8	93	Org:N Dep:R				
13 PFHpA	1.286509	1.178728	1.131168	1.130533	1.008084	1.081766	1.064985	1.080324	1.138289	1.113823	Avg:A Wt:C2	1.121421		RSD=6.7	
	114.7	105.1	100.9	100.8	89.9	96.5	95	96.3	101.5	99.3	Org:N Dep:R				
D 47 13C4_PFHpA	492	543	527	513	483	474	503	425	434	456	Avg:A Wt:C2	485		RSD=8.0	
	101.4	112	108.7	105.8	99.5	97.7	103.7	87.6	89.5	94	Org:N Dep:R				
D 45 13C3_PFHxS	146	153	151	151	138	146	142	109	122	130	Avg:A Wt:C2	139		RSD=10.4	
	105.5	110.2	108.9	108.6	99.1	105.4	102.5	78.6	87.7	93.5	Org:N Dep:R				
14 PFHxS	1.121227	1.085313	1.008377	1.043022	1.013859	1.034529	1.038313	1.150037	1.122995	1.090854	Avg:A Wt:C2	1.070853		RSD=4.7	
	104.7	101.4	94.2	97.4	94.7	96.6	97	107.4	104.9	101.9	Org:N Dep:R				
29 ADONA	6.792623	6.160722	6.316662	5.993784	5.749857	5.987295	6.069684	6.511944	6.645386	6.159051	Avg:A Wt:C2	6.238701		RSD=5.2	
	108.9	98.8	101.2	96.1	92.2	96	97.3	104.4	106.5	98.7	Org:N Dep:R				
2 6:2 FTS	Disabled	3.574242	3.490726	2.866088	2.538598	2.523102	2.760954	2.660239	2.538669	2.431365	Avg:A Wt:C2	2.820442		RSD=15.1	
	Disabled	126.7	123.8	101.6	90	89.5	97.9	94.3	90	86.2	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	16.1862	17.3062	18.3352	16.0446	15.4642	17.2064	13.8766	13.1698	14.7236	14.5148	Avg:A Wt:C2	15.6828		RSD=10.5	
	103.2	110.4	116.9	102.3	98.6	109.7	88.5	84	93.9	92.6	Org:N Dep:R				
D 53 13C8_PFOA	507	557	550	516	539	488	514	399	425	452	Avg:A Wt:C2	495		RSD=10.8	
	102.6	112.6	111.2	104.2	108.9	98.6	103.9	80.6	85.8	91.5	Org:N Dep:R				
20 PFOA	1.015673	0.954395	0.968422	0.961601	0.805359	0.967654	0.914120	0.960996	1.022079	0.924109	Avg:A Wt:C2	0.949441		RSD=6.4	
	107	100.5	102	101.3	84.8	101.9	96.3	101.2	107.7	97.3	Org:N Dep:R				
12 PFHpS	1.072621	0.975748	0.993382	0.911480	0.941168	0.969310	0.970020	1.036016	0.992607	0.945489	Avg:A Wt:C2	0.980784		RSD=4.8	
	109.4	99.5	101.3	92.9	96	98.8	98.9	105.6	101.2	96.4	Org:N Dep:R				
D 54 13C8_PFOS	137	158	156	136	140	145	139	112	132	139	Avg:A Wt:C2	139		RSD=9.3	
	98.1	113.4	112	97.7	100.5	103.9	99.5	80.1	94.7	100.1	Org:N Dep:R				
18 PFOS	1.578661	1.256972	1.000883	1.166541	1.036035	1.115945	1.144211	1.206493	1.103505	1.134872	Ln:A Wt:C2	1.093775	19.2285	R^2=0.992	
	106.4	96	82	102.9	92.8	101.1	104.2	110.1	100.8	103.7	Org:N Dep:R			RSE=8.5	
D 56 13C9_PFNA	625	675	643	627	619	632	609	526	549	585	Avg:A Wt:C2	609		RSD=7.3	
	102.7	110.9	105.5	102.9	101.6	103.8	100	86.3	90.2	96.1	Org:N Dep:R				
17 PFNA	1.211027	1.087750	1.056915	1.012170	0.943876	1.098155	1.021197	1.020035	1.056310	1.027970	Avg:A Wt:C2	1.053541		RSD=6.7	
	114.9	103.2	100.3	96.1	89.6	104.2	96.9	96.8	100.3	97.6	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.688737	3.285706	3.460432	3.845645	3.154403	3.493060	3.522847	4.062284	3.824058	3.722494	Avg:A Wt:C2	3.605967		RSD=7.6	
	102.3	91.1	96	106.6	87.5	96.9	97.7	112.7	106	103.2	Org:N Dep:R				
D 55 13C8_PFOSA	275	295	290	270	250	293	260	229	250	259	Avg:A Wt:C2	267		RSD=8.1	
	103	110.6	108.5	101	93.6	109.7	97.4	85.6	93.5	97.1	Org:N Dep:R				
19 PFOSA	1.105052	1.151548	0.991587	1.047427	1.090677	0.984879	1.000929	1.088139	1.091422	1.131345	Avg:A Wt:C2	1.068300		RSD=5.5	
	103.4	107.8	92.8	98	102.1	92.2	93.7	101.9	102.2	105.9	Org:N Dep:R				
16 PFNS	0.885752	0.729123	0.814794	0.808249	0.682093	0.784107	0.795145	0.885268	0.800149	0.781390	Avg:A Wt:C2	0.796607		RSD=7.8	
	111.2	91.5	102.3	101.5	85.6	98.4	99.8	111.1	100.4	98.1	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	17.8008	19.2204	19.3660	17.3986	14.4364	17.0066	16.8702	15.2824	16.6032	15.2764	Avg:A Wt:C2	16.9261		RSD=9.6	
	105.2	113.6	114.4	102.8	85.3	100.5	99.7	90.3	98.1	90.3	Org:N Dep:R				
10 PFDA	1.121987	1.091406	1.113959	1.087910	0.978715	1.120213	1.017481	1.097764	1.007865	1.020853	Avg:A Wt:C2	1.065815		RSD=5.0	
	105.3	102.4	104.5	102.1	91.8	105.1	95.5	103	94.6	95.8	Org:N Dep:R				
D 51 13C6_PFDA	603	658	666	609	591	587	608	491	532	555	Avg:A Wt:C2	590		RSD=9.1	
	102.3	111.5	112.9	103.3	100.1	99.4	103.1	83.2	90.2	94	Org:N Dep:R				
3 8:2 FTS	2.236535	2.068088	2.664043	2.264118	2.622474	2.487061	2.318105	2.066044	2.035501	2.214282	Avg:A Wt:C2	2.297625		RSD=9.9	
	97.3	90	115.9	98.5	114.1	108.2	100.9	89.9	88.6	96.4	Org:N Dep:R				
D 58 d3-MeFOSAA	131	136	148	123	120	139	127	123	148	141	Avg:A Wt:C2	133		RSD=7.6	
	97.8	102.1	110.6	92.2	90.2	104.2	95	92	110.6	105.3	Org:N Dep:R				
6 N-MeFOSAA	0.982031	0.877342	0.661060	0.696446	0.771956	0.772451	0.801981	0.743534	0.722426	0.784505	Avg:A Wt:C2	0.781373		RSD=11.8	
	125.7	112.3	84.6	89.1	98.8	98.9	102.6	95.2	92.5	100.4	Org:N Dep:R				
9 PFDS	1.094012	0.676181	0.766211	0.756593	0.723345	0.739213	0.781721	Disabled	Disabled	Disabled	Ln:A Wt:C	0.759859	5.436781	R^2=0.997	
	129.1	81.6	97.1	98.1	94.5	96.9	102.7	Disabled	Disabled	Disabled	Org:N Dep:R			RSE=15.8	
D 52 13C7_PFUdA	705	716	747	634	708	721	634	527	562	617	Avg:A Wt:C2	657		RSD=11.3	
	107.3	108.9	113.8	96.5	107.7	109.7	96.5	80.2	85.5	93.9	Org:N Dep:R				
D 60 d5-EtFOSAA	120	132	131	120	104	123	113	93.8996	105	107	Avg:A Wt:C2	115		RSD=10.8	
	104	115	113.8	104.8	90.7	106.8	98.7	81.7	91.5	92.8	Org:N Dep:R				
25 PFUdA	0.821472	0.962352	0.858297	0.977931	0.780823	0.847434	0.879772	0.930643	0.924546	0.862079	Avg:A Wt:C2	0.884535		RSD=7.1	
	92.9	108.8	97	110.6	88.3	95.8	99.5	105.2	104.5	97.5	Org:N Dep:R				
5 N-EtFOSAA	1.198909	0.961713	0.892920	0.867371	0.965256	1.028107	1.003115	1.013985	0.973630	1.016873	Avg:A Wt:C2	0.992188		RSD=9.1	
	120.8	96.9	90	87.4	97.3	103.6	101.1	102.2	98.1	102.5	Org:N Dep:R				
D 61 d7-MeFOSE	72.5780	83.3930	78.7110	74.4230	68.2950	72.5570	78.6500	69.2240	75.2560	78.0920	Avg:A Wt:C2	75.1179		RSD=6.2	
	96.6	111	104.8	99.1	90.9	96.6	104.7	92.2	100.2	104	Org:N Dep:R				
32 MeFOSE	1.199537	1.109925	1.261958	1.027478	1.123801	1.247495	1.098197	1.108855	1.089627	1.163942	Avg:A Wt:C2	1.143082		RSD=6.5	
	104.9	97.1	110.4	89.9	98.3	109.1	96.1	97	95.3	101.8	Org:N Dep:R				
D 57 d3-MeFOSA	45.9100	50.8680	49.2480	47.4650	40.7770	50.6270	47.8650	48.3890	57.2100	53.6180	Avg:A Wt:C2	49.1977		RSD=9.0	
	93.3	103.4	100.1	96.5	82.9	102.9	97.3	98.4	116.3	109	Org:N Dep:R				
26 MeFOSA	0.715313	0.916097	1.160453	1.107427	1.070285	1.011565	1.028426	0.962248	0.886511	0.982414	Avg:A Wt:C2	0.984074		RSD=12.8	
	72.7	93.1	117.9	112.5	108.8	102.8	104.5	97.8	90.1	99.8	Org:N Dep:R				
31 11Cl-PF3OUDS	3.404397	3.058323	3.010505	3.467293	3.029313	3.086520	3.133430	3.605481	3.180048	3.207502	Avg:A Wt:C2	3.218281		RSD=6.4	
	105.8	95	93.5	107.7	94.1	95.9	97.4	112	98.8	99.7	Org:N Dep:R				
D 62 d9-EtFOSE	83.2060	83.3240	80.1150	80.0420	68.4520	79.8740	80.7840	71.5570	74.6630	80.7740	Avg:A Wt:C2	78.2791		RSD=6.4	
	106.3	106.4	102.3	102.3	87.4	102	103.2	91.4	95.4	103.2	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	1.277071	1.196774	1.459964	1.175608	1.200359	1.117648	1.066810	1.096601	1.155936	1.168089	Avg:A Wt:C2	1.191486		RSD=9.3	
	107.2	100.4	122.5	98.7	100.7	93.8	89.5	92	97	98	Org:N Dep:R				
D 59 d5-EtFOSA	36.8070	47.1340	45.7690	40.0380	38.0250	41.1440	44.9320	38.0390	38.8640	44.7100	Avg:A Wt:C2	41.5462		RSD=9.1	
	88.6	113.4	110.2	96.4	91.5	99	108.1	91.6	93.5	107.6	Org:N Dep:R				
27 EtFOSA	1.488847	1.335978	1.069938	0.935911	1.094701	1.164738	0.992433	1.043006	1.161999	1.009442	Ln:A Wt:C2	1.042367	22.4410	R^2=0.991	
	99.8	106.6	91.9	85.5	102.9	110.7	94.8	99.8	111.3	96.7	Org:N Dep:R			RSE=8.7	
D 38 13C2_PFDoA	751	764	824	766	745	775	783	624	709	683	Avg:A Wt:C2	742		RSD=7.6	
	101.1	103	111	103.2	100.4	104.4	105.4	84.1	95.5	92.1	Org:N Dep:R				
11 PFDoA	1.203071	1.047758	1.013770	1.051741	0.942380	0.997848	1.014622	0.951126	0.927553	0.979381	Avg:A Wt:C2	1.012925		RSD=7.8	
	118.8	103.4	100.1	103.8	93	98.5	100.2	93.9	91.6	96.7	Org:N Dep:R				
4 10:2 FTS	3.962711	3.502179	5.322242	4.214461	4.683226	4.379310	4.094197	3.691728	3.624328	3.941042	Avg:A Wt:C2	4.141542		RSD=13.2	
	95.7	84.6	128.5	101.8	113.1	105.7	98.9	89.1	87.5	95.2	Org:N Dep:R				
34 PFDOS	0.961646	0.688365	0.788200	0.850372	0.773104	0.799596	0.843411	0.921802	0.879031	0.871188	Avg:A Wt:C2	0.837672		RSD=9.4	
	114.8	82.2	94.1	101.5	92.3	95.5	100.7	110	104.9	104	Org:N Dep:R				
24 PFTrDA	0.865096	0.889027	0.795691	0.800220	0.751036	0.797844	0.728467	0.822240	0.790279	0.792006	Avg:A Wt:C2	0.803191		RSD=5.9	
	107.7	110.7	99.1	99.6	93.5	99.3	90.7	102.4	98.4	98.6	Org:N Dep:R				
D 42 13C2_PFTeDA	857	906	910	886	846	885	881	766	853	960	Avg:A Wt:C2	875		RSD=5.8	
	98	103.5	104	101.2	96.7	101.1	100.7	87.6	97.4	109.7	Org:N Dep:R				
23 PFTeDA	0.875457	0.856690	0.821765	0.825215	0.748464	0.812728	0.806877	0.795894	0.788051	0.724492	Avg:A Wt:C2	0.805563		RSD=5.6	
	108.7	106.3	102	102.4	92.9	100.9	100.2	98.8	97.8	89.9	Org:N Dep:R				
D 40 13C2_PFHxDA	814	874	870	879	769	848	862	733	852	871	Avg:A Wt:C2	837		RSD=5.9	
	97.2	104.4	103.9	105	91.8	101.3	102.9	87.6	101.8	104	Org:N Dep:R				
35 PFHxDA	0.733171	0.654204	0.619485	0.586008	0.582836	0.580047	0.560434	0.571437	0.543605	0.544164	Avg:A Wt:C2	0.597539		RSD=9.8	
	122.7	109.5	103.7	98.1	97.5	97.1	93.8	95.6	91	91.1	Org:N Dep:R				
36 PFODA	1.009160	0.905721	0.933082	0.896012	0.910934	0.899798	0.900502	0.921096	0.877661	0.858878	Avg:A Wt:C2	0.911284		RSD=4.4	
	110.7	99.4	102.4	98.3	100	98.7	98.8	101.1	96.3	94.2	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	664657	698745	719376	661837	592352	636307	624788	525891	605736	631298	1.28
* 39 13C2_PFHxA	625107	644196	668847	652725	582381	657478	598734	516865	562139	590710	1.41
* 41 13C2_PFOA	529331	570233	575643	538819	516348	530663	516445	442186	454391	469502	2.99
* 43 13C3_PFBA	495400	543881	539827	529552	474184	502696	494309	440120	466568	479357	0.82
* 48 13C4_PFOS	137646	151522	150490	136409	126954	145871	137216	109022	123534	136345	0.23

13C2_PFDA ((|631298 - 664657| / (631298 + 664657)) / 2) * 100 = 1.29
13C2_PFHxA ((|590710 - 625107| / (590710 + 625107)) / 2) * 100 = 1.41
13C2_PFOA ((|469502 - 529331| / (469502 + 529331)) / 2) * 100 = 2.99
13C3_PFBA ((|479357 - 495400| / (479357 + 495400)) / 2) * 100 = 0.82
13C4_PFOS ((|136345 - 137646| / (136345 + 137646)) / 2) * 100 = 0.24

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	546861	611000	599976	573156	563032	559024	540622	472283	515476	532517	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	27792	61406	116299	280637	493876	1050051	2626976	4618423	7437630	10063548	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	511058	575526	551519	531930	523546	535244	519236	438943	481475	494900	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	29191	63829	116903	278776	492704	1145498	2810598	4753112	7636713	10089689	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	168570	196377	187768	178777	169277	176333	182475	140086	163595	172404	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	10295	21796	43255	101809	183900	393955	996905	1711209	2848967	3892346	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	100328	110814	107529	109742	90196	99931	96504	89997	92997	98755	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	1846	4178	7049	19995	36192	84721	191602	321857	519802	758441	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	606218	659089	647271	645478	600114	624153	618656	499241	541057	589408	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	625107	644196	668847	652725	582381	657478	598734	516865	562139	590710	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	34447	63935	143111	325914	563542	1269473	3015523	5320058	8651109	11056552	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	8230	16071	31748	80873	146874	310342	752587	1308560	2061129	3019383	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	14733	33958	67171	147510	279651	581605	1457690	2465817	4208040	5617453	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1060670	1201204	1180333	1123208	1000599	1037606	1072603	951477	1030944	989899	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	31646	64035	119317	290119	486690	1024742	2677910	4590070	7410037	10153232	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	491967	543255	527406	513243	482787	473643	502901	424879	433987	455783	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	146484	153093	151195	150796	137682	146445	142331	109122	121799	129872	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	7473	15120	27748	71564	127027	275733	672418	1141998	1867043	2578419	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	46865	88846	179931	425708	745736	1651909	4068989	6693818	11436842	15069894	
2 6:2 FTS	Disabled	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	Disabled	5864	12135	21797	37216	82312	181602	332130	531520	669113	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	80931	86531	91676	80223	77321	86032	69383	65849	73618	72574	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	529331	570233	575643	538819	516348	530663	516445	442186	454391	469502	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	507486	557306	550354	515742	538966	487751	513973	399015	424537	452495	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	25772	53189	106595	247969	434061	943948	2349164	3834519	6508653	8363090	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	7479	14221	28597	65425	123362	270274	657184	1076256	1726431	2337970	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	136560	157938	156053	136027	139992	144663	138558	111576	131902	139484	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	137646	151522	150490	136409	126954	145871	137216	109022	123534	136345	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	10003	18423	28989	73628	134594	299625	735624	1249233	2026119	2937984	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	625469	675477	642980	626954	618881	632127	609273	525981	549315	585461	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	37873	73475	135915	317292	584147	1388347	3110938	5365192	8703707	12036723	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	23474	48365	100658	243770	411563	941910	2274633	4224322	7051525	9678417	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	274883	295385	289667	269529	250019	292812	260109	228568	249606	259213	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	15188	34015	57446	141156	272690	576769	1301753	2487137	4086381	5865187	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	5806	11055	24413	52773	91668	217788	528834	948237	1519794	2092634	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	89004	96102	96830	86993	72182	85033	84351	76412	83016	76382	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	33854	71781	148329	331458	577932	1314178	3094369	5385157	8039433	11323896	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	664657	698745	719376	661837	592352	636307	624788	525891	605736	631298	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	603465	657693	665774	609348	590501	586575	608241	490557	531780	554629	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1907	3808	9885	18869	36269	81040	187322	302480	485646	648111	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	652831	681319	738360	615697	601725	695403	633865	614018	738160	702845	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	6411	11955	19524	42880	92901	214866	508348	913087	1599797	2205543	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	Disabled	Disabled	Disabled	#54
	7201	10295	23053	49606	97617	206174	522072	Disabled	Disabled	Disabled	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	704613	715580	747498	633789	707587	720614	633568	526954	561767	616790	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	597877	660852	654230	602499	521292	613448	567342	469498	525972	533502	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	28941	68864	128315	309901	552500	1221346	2786976	4904060	7790693	10634436	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7168	12711	23367	52259	100636	252276	569109	952128	1536307	2170015	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	72578	83393	78711	74423	68295	72557	78650	69224	75256	78092	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	4353	9256	19866	38234	76750	181029	431866	767594	1230014	1817891	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	45910	50868	49248	47465	40777	50627	47865	48389	57210	53618	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	1642	4660	11430	26282	43643	102425	246128	465622	760759	1053502	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	21897	45501	88510	222145	399483	841216	2044902	3789526	5926895	8428925	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	83206	83324	80115	80042	68452	79874	80784	71557	74663	80774	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	5313	9972	23393	47049	82167	178542	430906	784695	1294585	1887024	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	36807	47134	45769	40038	38025	41144	44932	38039	38864	44710	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2740	6297	9794	18736	41626	95844	222960	396749	677399	902643	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	750529	764375	823994	766014	745164	774776	782694	624240	709060	683408	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	45147	80088	167068	402824	702228	1546218	3970694	5937306	9865365	13386339	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3400	6489	19872	35343	65175	143592	332917	543874	870137	1160751	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	6356	10524	23813	55986	104765	223941	565609	995597	1683536	2352565	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	32464	67955	131129	306490	559645	1236301	2850833	5132753	8405331	10825266	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	857358	906057	909992	885835	846373	884540	880859	766250	852681	960299	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	37529	77621	149560	365502	633480	1437780	3553725	6098540	10079344	13914583	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	813944	874055	869763	879100	768834	848036	861669	732913	851921	870576	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	29838	57181	107761	257580	448104	983802	2414543	4188135	6946632	9474720	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41070	79165	162312	393842	700357	1526123	3879673	6750830	11215472	14954365	

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.749	1.749	1.742	1.749	1.743	1.743	1.749	1.756	1.750	1.749	1.748	0.253
8 PFBA	1.749	1.756	1.749	1.756	1.749	1.749	1.756	1.756	1.756	1.756	1.753	0.191
D 50 13C5_PFPeA	2.056	2.045	2.055	2.045	2.045	2.045	2.045	2.045	2.045	2.055	2.048	0.240
21 PFPeA	2.056	2.045	2.055	2.045	2.045	2.045	2.045	2.045	2.045	2.055	2.048	0.240
D 44 13C3_PFBS	2.087	2.077	2.087	2.077	2.087	2.087	2.077	2.088	2.088	2.087	2.084	0.245
7 PFBS	2.098	2.077	2.087	2.077	2.087	2.087	2.077	2.088	2.088	2.087	2.085	0.316
D 63 13C2_4:2 FTS_2	2.317	2.300	2.316	2.300	2.308	2.308	2.291	2.308	2.308	2.317	2.307	0.363
1 4:2 FTS	2.326	2.300	2.316	2.300	2.317	2.308	2.291	2.308	2.308	2.308	2.308	0.426
D 49 13C5_PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
* 39 13C2_PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
15 PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
22 PFPeS	2.370	2.353	2.370	2.353	2.361	2.362	2.344	2.362	2.362	2.370	2.360	0.374
28 GenX	2.451	2.424	2.450	2.424	2.441	2.442	2.415	2.433	2.433	2.442	2.435	0.476
D 66 13C3_GenX	2.451	2.424	2.450	2.424	2.441	2.442	2.415	2.433	2.433	2.442	2.435	0.476
13 PFHpA	2.681	2.654	2.681	2.645	2.672	2.672	2.645	2.663	2.672	2.681	2.666	0.529
D 47 13C4_PFHpA	2.681	2.645	2.681	2.645	2.672	2.672	2.645	2.663	2.672	2.672	2.664	0.544
D 45 13C3_PFHxS	2.690	2.654	2.690	2.654	2.681	2.681	2.645	2.672	2.681	2.690	2.674	0.632
14 PFHxS	2.690	2.654	2.690	2.654	2.681	2.681	2.654	2.672	2.681	2.690	2.674	0.573
29 ADONA	2.718	2.681	2.717	2.681	2.708	2.709	2.681	2.700	2.709	2.708	2.701	0.540
2 6:2 FTS	Disabled	2.975	3.011	2.987	3.005	3.012	2.987	3.012	3.027	3.032	3.005	0.623
D 64 13C2_6:2 FTS_2	3.020	2.981	3.011	2.987	3.005	3.012	2.987	3.012	3.027	3.032	3.007	0.570
* 41 13C2_PFOA	3.041	3.006	3.038	3.012	3.025	3.039	3.012	3.034	3.047	3.052	3.030	0.533
D 53 13C8_PFOA	3.041	3.006	3.032	3.012	3.025	3.039	3.012	3.034	3.047	3.052	3.029	0.525
20 PFOA	3.047	3.012	3.038	3.012	3.025	3.039	3.012	3.041	3.047	3.052	3.032	0.529
12 PFHpS	3.047	3.006	3.038	3.018	3.032	3.039	3.012	3.041	3.054	3.059	3.034	0.586
D 54 13C8_PFOS	3.403	3.374	3.394	3.394	3.394	3.402	3.402	3.418	3.433	3.438	3.405	0.575
* 48 13C4_PFOS	3.411	3.374	3.401	3.394	3.394	3.402	3.394	3.418	3.433	3.438	3.405	0.575
18 PFOS	3.411	3.374	3.401	3.394	3.394	3.409	3.402	3.426	3.433	3.438	3.408	0.580
D 56 13C9_PFNA	3.418	3.381	3.401	3.402	3.401	3.409	3.402	3.433	3.440	3.446	3.413	0.602
17 PFNA	3.411	3.381	3.408	3.402	3.401	3.409	3.402	3.433	3.448	3.446	3.414	0.624
30 9Cl-PF3ONS	3.609	3.585	3.598	3.615	3.606	3.615	3.615	3.639	3.651	3.649	3.618	0.604
D 55 13C8_PFOSA	3.705	3.679	3.695	3.717	3.710	3.710	3.717	3.740	3.746	3.751	3.717	0.615
19 PFOSA	3.719	3.679	3.695	3.717	3.710	3.710	3.717	3.733	3.753	3.751	3.718	0.616

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.746	3.726	3.737	3.752	3.744	3.752	3.758	3.775	3.790	3.787	3.756	0.561
D 65 13C2_8:2 FTS_2	3.753	3.726	3.737	3.759	3.751	3.752	3.758	3.782	3.798	3.795	3.761	0.630
10 PFDA	3.760	3.733	3.751	3.766	3.758	3.759	3.765	3.790	3.806	3.803	3.769	0.624
* 37 13C2_PFDA	3.760	3.733	3.744	3.766	3.758	3.765	3.765	3.790	3.798	3.803	3.768	0.601
D 51 13C6_PFDA	3.753	3.733	3.744	3.766	3.758	3.759	3.765	3.782	3.798	3.803	3.766	0.595
3 8:2 FTS	3.760	3.733	3.744	3.759	3.758	3.759	3.758	3.782	3.798	3.795	3.764	0.557
D 58 d3-MeFOSAA	3.912	3.887	3.901	3.918	3.917	3.918	3.926	3.945	3.954	3.960	3.923	0.591
6 N-MeFOSAA	3.912	3.895	3.909	3.926	3.926	3.918	3.926	3.945	3.963	3.960	3.928	0.567
9 PFDS	4.045	4.027	4.040	4.068	4.058	4.059	4.068	Disabled	Disabled	Disabled	4.051	0.379
D 52 13C7_PFUdA	4.062	4.044	4.058	4.085	4.076	4.068	4.086	4.098	4.106	4.120	4.080	0.575
D 60 d5-EtFOSAA	4.062	4.044	4.058	4.094	4.085	4.076	4.095	4.107	4.115	4.120	4.085	0.622
25 PFUdA	4.062	4.044	4.058	4.085	4.085	4.076	4.086	4.107	4.115	4.120	4.083	0.612
5 N-EtFOSAA	4.071	4.053	4.058	4.094	4.093	4.076	4.095	4.116	4.115	4.129	4.090	0.618
D 61 d7-MeFOSE	4.124	4.106	4.120	4.157	4.147	4.139	4.157	4.169	4.169	4.182	4.146	0.587
32 MeFOSE	4.133	4.115	4.129	4.165	4.156	4.148	4.166	4.178	4.186	4.192	4.156	0.611
D 57 d3-MeFOSA	4.142	4.124	4.138	4.174	4.164	4.156	4.175	4.187	4.196	4.201	4.165	0.613
26 MeFOSA	4.151	4.133	4.138	4.183	4.173	4.156	4.175	4.187	4.196	4.201	4.169	0.568
31 11Cl-PF3OUDS	4.206	4.178	4.191	4.233	4.221	4.213	4.234	4.237	4.247	4.252	4.221	0.570
D 62 d9-EtFOSE	4.287	4.267	4.282	4.324	4.313	4.304	4.314	4.328	4.338	4.342	4.309	0.579
33 EtFOSE	4.298	4.277	4.292	4.334	4.323	4.314	4.335	4.338	4.347	4.352	4.321	0.576
D 59 d5-EtFOSA	4.308	4.287	4.302	4.344	4.333	4.314	4.335	4.347	4.357	4.361	4.328	0.571
27 EtFOSA	4.318	4.287	4.302	4.344	4.342	4.324	4.344	4.357	4.357	4.370	4.334	0.599
D 38 13C2_PFDoA	4.328	4.307	4.322	4.363	4.352	4.344	4.363	4.375	4.375	4.386	4.351	0.592
11 PFDoA	4.338	4.307	4.322	4.363	4.352	4.344	4.363	4.375	4.375	4.386	4.352	0.572
4 10:2 FTS	4.347	4.317	4.332	4.372	4.370	4.353	4.372	4.383	4.390	4.394	4.363	0.569
34 PFDOS	4.544	4.508	4.513	4.566	4.565	4.541	4.566	4.569	4.577	4.582	4.553	0.565
24 PFTrDA	4.561	4.535	4.549	4.591	4.590	4.574	4.591	4.594	4.602	4.607	4.579	0.531
D 42 13C2_PFTeDA	4.769	4.728	4.738	4.792	4.786	4.766	4.792	4.794	4.800	4.803	4.776	0.546
23 PFTeDA	4.769	4.735	4.738	4.792	4.786	4.766	4.792	4.794	4.800	4.803	4.777	0.516
D 40 13C2_PFHxDA	5.128	5.081	5.091	5.145	5.139	5.115	5.145	5.146	5.152	5.156	5.130	0.509
35 PFHxDA	5.128	5.081	5.091	5.151	5.145	5.121	5.145	5.146	5.152	5.156	5.131	0.517
36 PFODA	5.489	5.440	5.444	5.514	5.507	5.472	5.507	5.502	5.517	5.514	5.490	0.531

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B028.d
Injection Date: 23-Jul-2021 01:14:35 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC- 1577 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	697063			123.8	50 - 150
8 PFBA			500.00	412.81	82.6	70 - 130
D 50 13C5_PFPeA	523546	646174			123.4	50 - 150
21 PFPeA			500.00	413.60	82.7	70 - 130
7 PFBS			442.50	374.28	84.6	70 - 130
D 44 13C3_PFBS	169277	219583			129.7	50 - 150
D 63 13C2_4:2 FTS_2	90196	109973			121.9	50 - 150
1 4:2 FTS			467.50	512.75	109.7	70 - 130
D 49 13C5_PFHxA	600114	753591			125.6	50 - 150
15 PFHxA			500.00	402.35	80.5	70 - 130
22 PFPeS			470.00	393.01	83.6	70 - 130
28 GenX			2500.00	2196.01	87.8	70 - 130
D 66 13C3_GenX	1000599	1205811			120.5	50 - 150
D 47 13C4_PFHpA	482787	629323			130.4	50 - 150
13 PFHpA			500.00	403.53	80.7	70 - 130
D 45 13C3_PFHxS	137682	162385			117.9	50 - 150
14 PFHxS			456.00	378.36	83	70 - 130
29 ADONA			2355.00	2154.64	91.5	70 - 130
D 64 13C2_6:2 FTS_2	77321	92003			119	50 - 150
2 6:2 FTS			475.00	376.51	79.3	70 - 130
20 PFOA			500.00	424.92	85	70 - 130
D 53 13C8_PFOA	538966	589571			109.4	50 - 150
12 PFHpS			475.00	416.18	87.6	70 - 130
18 PFOS			462.75	397.81	86	70 - 130
D 54 13C8_PFOS	139992	170702			121.9	50 - 150
17 PFNA			500.00	381.86	76.4	70 - 130
D 56 13C9_PFNA	618881	769275			124.3	50 - 150
30 9Cl-PF3ONS			2330.00	1889.62	81.1	70 - 130
D 55 13C8_PFOSA	250019	323061			129.2	50 - 150
19 PFOSA			500.00	433.98	86.8	70 - 130
16 PFNS			480.00	405.71	84.5	70 - 130
D 65 13C2_8:2 FTS_2	72182	102430			141.9	50 - 150
10 PFDA			500.00	440.32	88.1	70 - 130
3 8:2 FTS			480.00	469.71	97.9	70 - 130
D 51 13C6_PFDA	590501	740625			125.4	50 - 150
D 58 d3-MeFOSAA	601725	791178			131.5	50 - 150

Report Date: 23-Jul-2021 08:47:37 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B028.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	534.50	106.9	70 - 130
9 PFDS			482.50	416.99	86.4	70 - 130
D 52 13C7_PFUdA	707587	862142			121.8	50 - 150
25 PFUdA			500.00	410.40	82.1	70 - 130
D 60 d5-EtFOSAA	521292	662875			127.2	50 - 150
5 N-EtFOSAA			500.00	547.14	109.4	70 - 130
D 61 d7-MeFOSE	68295	98617			144.4	50 - 150
D 57 d3-MeFOSA	40777	55738			136.7	50 - 150
31 11Cl-PF3OUDS			2355.00	1917.40	81.4	70 - 130
D 62 d9-EtFOSE	68452	89797			131.2	50 - 150
D 59 d5-EtFOSA	38025	50890			133.8	50 - 150
11 PFDoA			500.00	395.66	79.1	70 - 130
D 38 13C2_PFDoA	745164	941425			126.3	50 - 150
4 10:2 FTS			2410.00	2228.22	92.5	70 - 130
24 PFTrDA			500.00	449.20	89.8	70 - 130
23 PFTeDA			500.00	437.70	87.5	70 - 130
D 42 13C2_PFTeDA	846373	1087648			128.5	50 - 150
D 40 13C2_PFHxDA	768834	934133			121.5	50 - 150

Report Date: 29-Jul-2021 18:55:03 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\072821-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	28-Jul-2021 12:35:26	072821005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	28-Jul-2021 12:46:55	072821006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	28-Jul-2021 12:58:02	072821007.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ10188-001	28-Jul-2021 13:10:17	072821008.d	MBlk		Aqueous	1	10188	Surrogates	Smp	0.1100		
2	WQ10188-002	28-Jul-2021 13:21:19	072821009.d	LCS		Aqueous	1	10188	Analytes	100x PDS	0.2000		PeS(133.4),MFOSA(167%), RR TO CONFIRM
3	WG27017-001	28-Jul-2021 13:32:11	072821010.d	Client	AFFF21-FRB-01-072621-00	Aqueous	1	10188	Surrogates	Smp	0.1100		
4	WG27017-002	28-Jul-2021 13:43:06	072821011.d	Client	AFFF21-ICE-01-072621-01	Aqueous	1	10188	Surrogates	Smp	0.1100		
5	WG27016-001	28-Jul-2021 13:53:42	072821012.d	Client	AFFF21-GAC-01-072621-00	Aqueous	1	10188	Surrogates	Smp	0.1100		
6	WG21050-003	28-Jul-2021 14:04:16	072821013.d	Client	FP-15e	Soil	5	99971	Surrogates	Smp	0.1100		
7	WG21051-002	28-Jul-2021 14:14:53	072821014.d	Client	FP-14c/PTFE Powder	Soil	5	99971	Surrogates	Smp	0.1100		
8	WG21051-001	28-Jul-2021 14:25:35	072821015.d	Client	FP-14/PTFE Powder	Soil	100	99971	Surrogates	Smp	0.1100		
9	WG20002-003	28-Jul-2021 14:36:13	072821016.d	Client	AOPC7-SB02-0-0.5	Soil	5	99970	Surrogates	Smp	0.1100		
10	WG20002-004	28-Jul-2021 14:46:51	072821017.d	Client	AOPC7-SB02-0.5-2	Soil	20	99970	Surrogates	Smp	0.1100		
11	WG20002-009	28-Jul-2021 14:57:32	072821018.d	Client	AOPC1-SB03-0-0.5	Soil	5	99970	Surrogates	Smp	0.1100		
12	WG20002-010	28-Jul-2021 15:08:05	072821019.d	Client	AOPC1-SB03-0.5-2	Soil	10	99970	Surrogates	Smp	0.1100		
13	ID CCV 1000_SVLC-1573	28-Jul-2021 15:18:39	072821020.d	CCV					Analytes	L-5	1.00		
14	ccb 1	28-Jul-2021 15:29:15	072821021.d	InstBlk					Surrogates	Smp	0.1100		
15	WG20002-014	28-Jul-2021 15:39:52	072821022.d	Client	AOPC6-SB01-0.5-2	Soil	20	99970	Surrogates	Smp	0.1100		
16	WG20004-019	28-Jul-2021 15:50:32	072821023.d	Client	FB-07-071521	Aqueous	1	10188	Surrogates	Smp	0.1100		
17	WG20004-020	28-Jul-2021 16:01:10	072821024.d	Client	AOPC5-14D12A-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
18	WG20004-021	28-Jul-2021 16:11:48	072821025.d	Client	AOPC5-14D12A-071621-FD	Aqueous	1	10188	Surrogates	Smp	0.1100		
19	WG20004-022	28-Jul-2021 16:22:25	072821026.d	Client	AOPC3-W19-2-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
20	WG20004-023	28-Jul-2021 16:33:05	072821027.d	Client	AOPC3-W7-10-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
21	WG20004-024	28-Jul-2021 16:43:46	072821028.d	Client	AOPC24-171A-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
22	WG20004-024MS	28-Jul-2021 16:54:22	072821029.d	MS		Aqueous	1	10188	Analytes	100x PDS	0.2000		
23	WG20004-025	28-Jul-2021 17:04:56	072821030.d	Client	FB-08-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		
24	WG20004-026	28-Jul-2021 17:15:33	072821031.d	Client	FB-07-071621	Aqueous	1	10188	Surrogates	Smp	0.1100		SUR: TeDA(LOW), INSUFFICIENT SAMPLE, NCM
25	WG22011-001	28-Jul-2021 17:26:09	072821032.d	Client	AOPC24-W89-1-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
26	ID CCV 1000A_SVLC-1573	28-Jul-2021 17:36:43	072821033.d	CCV					Analytes	L-5	1.00		
27	CCB 2	28-Jul-2021 17:47:22	072821034.d	InstBlk					Surrogates	Smp	0.1100		
28	WG22011-002	28-Jul-2021 17:58:05	072821035.d	Client	AOPC3-W7-3-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
29	WG22011-003	28-Jul-2021 18:08:42	072821036.d	Client	AOPC3-W7-3-071921-FD	Aqueous	1	10188	Surrogates	Smp	0.1100		
30	WG22011-004	28-Jul-2021 18:19:21	072821037.d	Client	AOPC3-W7-11-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
31	WG22011-005	28-Jul-2021 18:30:02	072821038.d	Client	AOPC03-W7-13-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd),ncm
32	WG22011-006	28-Jul-2021 18:40:36	072821039.d	Client	AOPC03-UST-MW-02-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd),ncm
33	WG22011-007	28-Jul-2021 18:51:11	072821040.d	Client	AOPC21-W4-14-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd)6:2(detect),8:2(nd),confirmed, ncm
34	WG22011-007DU	28-Jul-2021 19:01:47	072821041.d	Client		Aqueous	1	10188	Surrogates	Smp	0.1100		sur: 4:2(nd)6:2(detect),8:2(nd),ncm parent sample
35	WG22011-008	28-Jul-2021 19:12:26	072821042.d	Client	AOPC21-W6-6-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
36	WG22011-009	28-Jul-2021 19:23:04	072821043.d	Client	FB-09-071921	Aqueous	1	10188	Surrogates	Smp	0.1100		
37	ID CCV 1000B_SVLC-1573	28-Jul-2021 19:33:41	072821044.d	CCV					Analytes	L-5	1.00		
38	CCB 3	28-Jul-2021 19:44:21	072821045.d	InstBlk					Surrogates	Smp	0.1100		
39	WQ10065-001	28-Jul-2021 19:54:59	072821046.d	MBlk		Soil	1	10065	Surrogates	Smp	0.1100		
40	WQ10065-002	28-Jul-2021 20:05:40	072821047.d	LCS		Soil	1	10065	Analytes	100x PDS	0.1000		
41	WG20002-020	28-Jul-2021 20:16:22	072821048.d	Client	AOPC2-SB03-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		

Report Date: 29-Jul-2021 18:55:03 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\072821-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
42	WG20002-020MS	28-Jul-2021 20:26:59	072821049.d	MS		Soil	1	10065	Analytes	100x PDS	0.1000		
43	WG20002-020MD	28-Jul-2021 20:37:37	072821050.d	MSD		Soil	1	10065	Analytes	100x PDS	0.1000		
44	WG20002-022	28-Jul-2021 20:48:15	072821051.d	Client	AOPC2-SB04-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
45	WG20002-023	28-Jul-2021 20:58:51	072821052.d	Client	AOPC2-SB05-0-0.5	Soil	1	10065	Surrogates	Smp	0.1100		
46	WG20002-024	28-Jul-2021 21:09:28	072821053.d	Client	AOPC2-SB05-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
47	WG20002-025	28-Jul-2021 21:20:07	072821054.d	Client	AOPC2-SB06-0-0.5	Soil	1	10065	Surrogates	Smp	0.1100		
48	WG20002-026	28-Jul-2021 21:30:47	072821055.d	Client	AOPC2-SB06-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
49	WG20002-027	28-Jul-2021 21:41:27	072821056.d	Client	AOPC2-SB07-0-0.5	Soil	1	10065	Surrogates	Smp	0.1100		
50	WG20002-028	28-Jul-2021 21:52:06	072821057.d	Client	AOPC2-SB07-0.5-2	Soil	1	10065	Surrogates	Smp	0.1100		
51	WG22019-001	28-Jul-2021 22:02:46	072821058.d	Client	RRAD-FFTA-01-SE-072021	Soil	1	10065	Surrogates	Smp	0.1100		
52	WG22019-001MS	28-Jul-2021 22:13:22	072821059.d	MS		Soil	1	10065	Analytes	100x PDS	0.1000		
53	WG22019-001MD	28-Jul-2021 22:23:58	072821060.d	MSD		Soil	1	10065	Analytes	100x PDS	0.1000		
54	WG22019-002	28-Jul-2021 22:34:36	072821061.d	Client	RRAD-FD-01-SE-072021	Soil	1	10065	Surrogates	Smp	0.1100		
55	ID CCV 1000C_SVLC-1573	28-Jul-2021 22:45:16	072821062.d	CCV					Analytes	L-5	1.00		MeFOSA(139%)

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821005.d
Injection Date: 28-Jul-2021 12:35:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	546632			97.1	50 - 150
8 PFBA			100.00	106.07	106.1	70 - 130
D 50 13C5_PFPeA	523546	503885			96.2	50 - 150
21 PFPeA			100.00	99.807	99.8	70 - 130
7 PFBS			88.400	86.535	97.9	70 - 130
D 44 13C3_PFBS	169277	179569			106.1	50 - 150
D 63 13C2_4:2 FTS_2	90196	94243			104.5	50 - 150
1 4:2 FTS			93.400	82.174	88	70 - 130
D 49 13C5_PFHxA	600114	629624			104.9	50 - 150
15 PFHxA			100.00	97.024	97	70 - 130
22 PFPeS			93.800	101.63	108.3	70 - 130
28 GenX			200.00	209.53	104.8	70 - 130
D 66 13C3_GenX	1000599	1187852			118.7	50 - 150
D 47 13C4_PFHpA	482787	481492			99.7	50 - 150
13 PFHpA			100.00	110.72	110.7	70 - 130
D 45 13C3_PFHxS	137682	146388			106.3	50 - 150
14 PFHxS			91.000	99.394	109.2	70 - 130
29 ADONA			94.200	91.184	96.8	70 - 130
D 64 13C2_6:2 FTS_2	77321	82438			106.6	50 - 150
2 6:2 FTS			94.800	138.96	146.6	70 - 130
20 PFOA			100.00	105.05	105.1	70 - 130
D 53 13C8_PFOA	538966	470743			87.3	50 - 150
12 PFHpS			95.200	100.76	105.8	70 - 130
18 PFOS			92.800	89.095	96	70 - 130
D 54 13C8_PFOS	139992	144963			103.6	50 - 150
17 PFNA			100.00	107.95	108	70 - 130
D 56 13C9_PFNA	618881	590148			95.4	50 - 150
30 9Cl-PF3ONS			93.200	95.720	102.7	70 - 130
D 55 13C8_PFOSA	250019	308005			123.2	50 - 150
19 PFOSA			100.00	94.128	94.1	70 - 130
16 PFNS			96.000	98.737	102.9	70 - 130
D 65 13C2_8:2 FTS_2	72182	92140			127.6	50 - 150
10 PFDA			100.00	107.05	107.1	70 - 130
3 8:2 FTS			95.800	94.614	98.8	70 - 130
D 51 13C6_PFDA	590501	611283			103.5	50 - 150
D 58 d3-MeFOSAA	601725	685228			113.9	50 - 150

NO SAMPLES ASSOCIATED

Report Date: 29-Jul-2021 18:54:25 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	107.78	107.8	70 - 130
9 PFDS			96.400	82.676	85.8	70 - 130
D 52 13C7_PFUdA	707587	617181			87.2	50 - 150
25 PFUdA			100.00	109.36	109.4	70 - 130
D 60 d5-EtFOSAA	521292	639425			122.7	50 - 150
5 N-EtFOSAA			100.00	104.16	104.2	70 - 130
D 61 d7-MeFOSE	68295	82233			120.4	50 - 150
32 MeFOSE			100.00	101.17	101.2	70 - 130
D 57 d3-MeFOSA	40777	48879			119.9	50 - 150
26 MeFOSA			100.00	155.34	155.3	70 - 130
31 11Cl-PF3OUDS			94.200	86.050	91.3	70 - 130
D 62 d9-EtFOSE	68452	91569			133.8	50 - 150
33 EtFOSE			100.00	114.93	114.9	70 - 130
D 59 d5-EtFOSA	38025	46046			121.1	50 - 150
27 EtFOSA			100.00	129.09	129.1	70 - 130
11 PFDoA			100.00	101.65	101.6	70 - 130
D 38 13C2_PFDoA	745164	634813			85.2	50 - 150
4 10:2 FTS			96.400	59.041	61.2	70 - 130
34 PFDOS			96.800	106.64	110.2	70 - 130
24 PFTrDA			100.00	110.77	110.8	70 - 130
23 PFTeDA			100.00	104.62	104.6	70 - 130
D 42 13C2_PFTeDA	846373	795642			94	50 - 150
D 40 13C2_PFHxDA	768834	940962			122.4	50 - 150
35 PFHxDA			100.00	110.61	110.6	70 - 130
36 PFODA			100.00	101.33	101.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821006.d
Injection Date: 28-Jul-2021 12:46:55 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	532713			97.5	50 - 150
8 PFBA			200.00	209.70	104.9	70 - 130
D 50 13C5_PFPeA	503885	506454			100.5	50 - 150
21 PFPeA			200.00	205.71	102.9	70 - 130
7 PFBS			176.80	167.24	94.6	70 - 130
D 44 13C3_PFBS	179569	173147			96.4	50 - 150
D 63 13C2_4:2 FTS_2	94243	92247			97.9	50 - 150
1 4:2 FTS			186.80	206.65	110.6	70 - 130
D 49 13C5_PFHxA	629624	592724			94.1	50 - 150
15 PFHxA			200.00	196.96	98.5	70 - 130
22 PFPeS			187.60	175.54	93.6	70 - 130
28 GenX			400.00	388.20	97	70 - 130
D 66 13C3_GenX	1187852	1201835			101.2	50 - 150
D 47 13C4_PFHpA	481492	478720			99.4	50 - 150
13 PFHpA			200.00	194.94	97.5	70 - 130
D 45 13C3_PFHxS	146388	146100			99.8	50 - 150
14 PFHxS			182.00	174.78	96	70 - 130
29 ADONA			188.40	203.53	108	70 - 130
D 64 13C2_6:2 FTS_2	82438	81726			99.1	50 - 150
2 6:2 FTS			189.60	242.08	127.7	70 - 130
20 PFOA			200.00	216.34	108.2	70 - 130
D 53 13C8_PFOA	470743	480954			102.2	50 - 150
12 PFHpS			190.40	181.59	95.4	70 - 130
18 PFOS			185.60	192.84	103.9	70 - 130
D 54 13C8_PFOS	144963	138675			95.7	50 - 150
17 PFNA			200.00	206.95	103.5	70 - 130
D 56 13C9_PFNA	590148	602400			102.1	50 - 150
30 9Cl-PF3ONS			186.40	202.35	108.6	70 - 130
D 55 13C8_PFOSA	308005	289138			93.9	50 - 150
19 PFOSA			200.00	192.38	96.2	70 - 130
16 PFNS			192.00	183.05	95.3	70 - 130
D 65 13C2_8:2 FTS_2	92140	80795			87.7	50 - 150
10 PFDA			200.00	218.74	109.4	70 - 130
3 8:2 FTS			191.60	188.51	98.4	70 - 130
D 51 13C6_PFDA	611283	584926			95.7	50 - 150
D 58 d3-MeFOSAA	685228	678804			99.1	50 - 150

NO SAMPLES ASSOCIATED

Report Date: 29-Jul-2021 18:54:26 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	204.94	102.5	70 - 130
9 PFDS			192.80	188.66	97.9	70 - 130
D 52 13C7_PFUdA	617181	615913			99.8	50 - 150
25 PFUdA			200.00	220.01	110	70 - 130
D 60 d5-EtFOSAA	639425	665547			104.1	50 - 150
5 N-EtFOSAA			200.00	175.76	87.9	70 - 130
D 61 d7-MeFOSE	82233	83653			101.7	50 - 150
32 MeFOSE			200.00	166.69	83.3	70 - 130
D 57 d3-MeFOSA	48879	55116			112.8	50 - 150
26 MeFOSA			200.00	248.05	124	70 - 130
31 11Cl-PF3OUDS			188.40	190.21	101	70 - 130
D 62 d9-EtFOSE	91569	96548			105.4	50 - 150
33 EtFOSE			200.00	190.04	95	70 - 130
D 59 d5-EtFOSA	46046	46074			100.1	50 - 150
27 EtFOSA			200.00	189.84	94.9	70 - 130
11 PFDoA			200.00	215.77	107.9	70 - 130
D 38 13C2_PFDoA	634813	602536			94.9	50 - 150
4 10:2 FTS			192.80	124.16	64.4	70 - 130
34 PFDOS			193.60	204.87	105.8	70 - 130
24 PFTrDA			200.00	236.97	118.5	70 - 130
23 PFTeDA			200.00	207.18	103.6	70 - 130
D 42 13C2_PFTeDA	795642	780807			98.1	50 - 150
D 40 13C2_PFHxDA	940962	935974			99.5	50 - 150
35 PFHxDA			200.00	210.73	105.4	70 - 130
36 PFODA			200.00	198.88	99.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821020.d
Injection Date: 28-Jul-2021 15:18:39 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 13
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	537206			98.3	50 - 150
8 PFBA			1000.00	913.62	91.4	70 - 130
D 50 13C5_PFPeA	503885	504020			100	50 - 150
21 PFPeA			1000.00	876.21	87.6	70 - 130
7 PFBS			884.00	774.61	87.6	70 - 130
D 44 13C3_PFBS	179569	182176			101.5	50 - 150
D 63 13C2_4:2 FTS_2	94243	72781			77.2	50 - 150
1 4:2 FTS			934.00	1114.80	119.4	70 - 130
D 49 13C5_PFHxA	629624	614275			97.6	50 - 150
15 PFHxA			1000.00	857.51	85.8	70 - 130
22 PFPeS			938.00	875.66	93.4	70 - 130
28 GenX			2000.00	2027.42	101.4	70 - 130
D 66 13C3_GenX	1187852	1062616			89.5	50 - 150
D 47 13C4_PFHpA	481492	461489			95.8	50 - 150
13 PFHpA			1000.00	921.59	92.2	70 - 130
D 45 13C3_PFHxS	146388	141652			96.8	50 - 150
14 PFHxS			910.00	849.46	93.3	70 - 130
29 ADONA			942.00	897.10	95.2	70 - 130
D 64 13C2_6:2 FTS_2	82438	78305			95	50 - 150
2 6:2 FTS			948.00	793.26	83.7	70 - 130
20 PFOA			1000.00	961.19	96.1	70 - 130
D 53 13C8_PFOA	470743	481448			102.3	50 - 150
12 PFHpS			952.00	963.52	101.2	70 - 130
18 PFOS			928.00	874.93	94.3	70 - 130
D 54 13C8_PFOS	144963	143465			99	50 - 150
17 PFNA			1000.00	887.59	88.8	70 - 130
D 56 13C9_PFNA	590148	624997			105.9	50 - 150
30 9Cl-PF3ONS			932.00	882.55	94.7	70 - 130
D 55 13C8_PFOSA	308005	259561			84.3	50 - 150
19 PFOSA			1000.00	994.11	99.4	70 - 130
16 PFNS			960.00	880.34	91.7	70 - 130
D 65 13C2_8:2 FTS_2	92140	80829			87.7	50 - 150
10 PFDA			1000.00	977.88	97.8	70 - 130
3 8:2 FTS			958.00	871.34	91	70 - 130
D 51 13C6_PFDA	611283	587218			96.1	50 - 150
D 58 d3-MeFOSAA	685228	642514			93.8	50 - 150

Report Date: 29-Jul-2021 18:54:34 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\072821-DOD.b\072821020.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1061.22	106.1	70 - 130
9 PFDS			964.00	853.29	88.5	70 - 130
D 52 13C7_PFUdA	617181	651512			105.6	50 - 150
25 PFUdA			1000.00	884.22	88.4	70 - 130
D 60 d5-EtFOSAA	639425	612730			95.8	50 - 150
5 N-EtFOSAA			1000.00	1073.91	107.4	70 - 130
D 61 d7-MeFOSE	82233	79731			97	50 - 150
32 MeFOSE			1000.00	1023.81	102.4	70 - 130
D 57 d3-MeFOSA	48879	53918			110.3	50 - 150
26 MeFOSA			1000.00	1014.86	101.5	70 - 130
31 11Cl-PF3OUDS			942.00	848.83	90.1	70 - 130
D 62 d9-EtFOSE	91569	82839			90.5	50 - 150
33 EtFOSE			1000.00	987.52	98.8	70 - 130
D 59 d5-EtFOSA	46046	46326			100.6	50 - 150
27 EtFOSA			1000.00	975.21	97.5	70 - 130
11 PFDoA			1000.00	950.45	95	70 - 130
D 38 13C2_PFDoA	634813	606075			95.5	50 - 150
4 10:2 FTS			964.00	607.41	63	70 - 130
34 PFDOS			968.00	971.90	100.4	70 - 130
24 PFTrDA			1000.00	1045.86	104.6	70 - 130
23 PFTeDA			1000.00	891.80	89.2	70 - 130
D 42 13C2_PFTeDA	795642	809980			101.8	50 - 150
D 40 13C2_PFHxDA	940962	813603			86.5	50 - 150
35 PFHxDA			1000.00	1053.14	105.3	70 - 130
36 PFODA			1000.00	1033.85	103.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821033.d		
Injection Date:	28-Jul-2021 17:36:43	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	26
Sample Info:	ID CCV 1000A_SVLC-1573	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	545149			99.7	50 - 150
8 PFBA			1000.00	971.01	97.1	70 - 130
D 50 13C5_PFPeA	503885	523750			103.9	50 - 150
21 PFPeA			1000.00	901.15	90.1	70 - 130
7 PFBS			884.00	779.30	88.2	70 - 130
D 44 13C3_PFBS	179569	188474			105	50 - 150
D 63 13C2_4:2 FTS_2	94243	83272			88.4	50 - 150
1 4:2 FTS			934.00	877.37	93.9	70 - 130
D 49 13C5_PFHxA	629624	605375			96.1	50 - 150
15 PFHxA			1000.00	894.52	89.5	70 - 130
22 PFPeS			938.00	804.47	85.8	70 - 130
28 GenX			2000.00	2019.49	101	70 - 130
D 66 13C3_GenX	1187852	1077187			90.7	50 - 150
D 47 13C4_PFHpA	481492	507047			105.3	50 - 150
13 PFHpA			1000.00	855.84	85.6	70 - 130
D 45 13C3_PFHxS	146388	153046			104.5	50 - 150
14 PFHxS			910.00	809.61	89	70 - 130
29 ADONA			942.00	816.31	86.7	70 - 130
D 64 13C2_6:2 FTS_2	82438	77999			94.6	50 - 150
2 6:2 FTS			948.00	780.78	82.4	70 - 130
20 PFOA			1000.00	948.39	94.8	70 - 130
D 53 13C8_PFOA	470743	484657			103	50 - 150
12 PFHpS			952.00	878.21	92.2	70 - 130
18 PFOS			928.00	799.33	86.1	70 - 130
D 54 13C8_PFOS	144963	149391			103.1	50 - 150
17 PFNA			1000.00	935.11	93.5	70 - 130
D 56 13C9_PFNA	590148	619880			105	50 - 150
30 9Cl-PF3ONS			932.00	885.73	95	70 - 130
D 55 13C8_PFOSA	308005	285372			92.7	50 - 150
19 PFOSA			1000.00	999.93	100	70 - 130
16 PFNS			960.00	956.75	99.7	70 - 130
D 65 13C2_8:2 FTS_2	92140	81699			88.7	50 - 150
10 PFDA			1000.00	925.82	92.6	70 - 130
3 8:2 FTS			958.00	969.75	101.2	70 - 130
D 51 13C6_PFDA	611283	610453			99.9	50 - 150
D 58 d3-MeFOSAA	685228	658321			96.1	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1049.15	104.9	70 - 130
9 PFDS			964.00	900.43	93.4	70 - 130
D 52 13C7_PFUdA	617181	660939			107.1	50 - 150
25 PFUdA			1000.00	916.37	91.6	70 - 130
D 60 d5-EtFOSAA	639425	631092			98.7	50 - 150
5 N-EtFOSAA			1000.00	1007.20	100.7	70 - 130
D 61 d7-MeFOSE	82233	80139			97.5	50 - 150
32 MeFOSE			1000.00	1092.62	109.3	70 - 130
D 57 d3-MeFOSA	48879	49134			100.5	50 - 150
26 MeFOSA			1000.00	1184.64	118.5	70 - 130
31 11Cl-PF3OUDS			942.00	863.21	91.6	70 - 130
D 62 d9-EtFOSE	91569	96370			105.2	50 - 150
33 EtFOSE			1000.00	913.45	91.3	70 - 130
D 59 d5-EtFOSA	46046	42954			93.3	50 - 150
27 EtFOSA			1000.00	1117.98	111.8	70 - 130
11 PFDoA			1000.00	988.89	98.9	70 - 130
D 38 13C2_PFDoA	634813	630434			99.3	50 - 150
4 10:2 FTS			964.00	638.82	66.3	70 - 130
34 PFDOS			968.00	949.67	98.1	70 - 130
24 PFTrDA			1000.00	1036.97	103.7	70 - 130
23 PFTeDA			1000.00	883.81	88.4	70 - 130
D 42 13C2_PFTeDA	795642	828717			104.2	50 - 150
D 40 13C2_PFHxDA	940962	870336			92.5	50 - 150
35 PFHxDA			1000.00	1032.48	103.2	70 - 130
36 PFODA			1000.00	986.11	98.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821044.d
Injection Date: 28-Jul-2021 19:33:41 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 37
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	552865			101.1	50 - 150
8 PFBA			1000.00	934.48	93.4	70 - 130
D 50 13C5_PFPeA	503885	536769			106.5	50 - 150
21 PFPeA			1000.00	941.28	94.1	70 - 130
7 PFBS			884.00	782.86	88.6	70 - 130
D 44 13C3_PFBS	179569	192235			107.1	50 - 150
D 63 13C2_4:2 FTS_2	94243	82169			87.2	50 - 150
1 4:2 FTS			934.00	1081.11	115.8	70 - 130
D 49 13C5_PFHxA	629624	619247			98.4	50 - 150
15 PFHxA			1000.00	899.50	90	70 - 130
22 PFPeS			938.00	767.43	81.8	70 - 130
28 GenX			2000.00	2054.98	102.7	70 - 130
D 66 13C3_GenX	1187852	1042789			87.8	50 - 150
D 47 13C4_PFHpA	481492	511172			106.2	50 - 150
13 PFHpA			1000.00	884.17	88.4	70 - 130
D 45 13C3_PFHxS	146388	157053			107.3	50 - 150
14 PFHxS			910.00	813.24	89.4	70 - 130
29 ADONA			942.00	782.91	83.1	70 - 130
D 64 13C2_6:2 FTS_2	82438	71868			87.2	50 - 150
2 6:2 FTS			948.00	966.28	101.9	70 - 130
20 PFOA			1000.00	875.16	87.5	70 - 130
D 53 13C8_PFOA	470743	505594			107.4	50 - 150
12 PFHpS			952.00	897.95	94.3	70 - 130
18 PFOS			928.00	821.20	88.5	70 - 130
D 54 13C8_PFOS	144963	154974			106.9	50 - 150
17 PFNA			1000.00	971.06	97.1	70 - 130
D 56 13C9_PFNA	590148	627173			106.3	50 - 150
30 9Cl-PF3ONS			932.00	872.21	93.6	70 - 130
D 55 13C8_PFOSA	308005	289452			94	50 - 150
19 PFOSA			1000.00	956.88	95.7	70 - 130
16 PFNS			960.00	900.45	93.8	70 - 130
D 65 13C2_8:2 FTS_2	92140	81466			88.4	50 - 150
10 PFDA			1000.00	925.43	92.5	70 - 130
3 8:2 FTS			958.00	867.81	90.6	70 - 130
D 51 13C6_PFDA	611283	622283			101.8	50 - 150
D 58 d3-MeFOSAA	685228	700845			102.3	50 - 150

Report Date: 29-Jul-2021 18:54:50 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\072821-DOD.b\072821044.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	985.82	98.6	70 - 130
9 PFDS			964.00	955.88	99.2	70 - 130
D 52 13C7_PFUdA	617181	675454			109.4	50 - 150
25 PFUdA			1000.00	930.24	93	70 - 130
D 60 d5-EtFOSAA	639425	639445			100	50 - 150
5 N-EtFOSAA			1000.00	918.02	91.8	70 - 130
D 61 d7-MeFOSE	82233	89728			109.1	50 - 150
32 MeFOSE			1000.00	962.59	96.3	70 - 130
D 57 d3-MeFOSA	48879	54203			110.9	50 - 150
26 MeFOSA			1000.00	1097.59	109.8	70 - 130
31 11Cl-PF3OUDS			942.00	861.40	91.4	70 - 130
D 62 d9-EtFOSE	91569	93460			102.1	50 - 150
33 EtFOSE			1000.00	1007.66	100.8	70 - 130
D 59 d5-EtFOSA	46046	47531			103.2	50 - 150
27 EtFOSA			1000.00	1052.33	105.2	70 - 130
11 PFDoA			1000.00	974.64	97.5	70 - 130
D 38 13C2_PFDoA	634813	661644			104.2	50 - 150
4 10:2 FTS			964.00	629.84	65.3	70 - 130
34 PFDOS			968.00	874.45	90.3	70 - 130
24 PFTrDA			1000.00	1067.84	106.8	70 - 130
23 PFTeDA			1000.00	893.23	89.3	70 - 130
D 42 13C2_PFTeDA	795642	870328			109.4	50 - 150
D 40 13C2_PFHxDA	940962	902003			95.9	50 - 150
35 PFHxDA			1000.00	1041.78	104.2	70 - 130
36 PFODA			1000.00	1002.51	100.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072821-DOD.b\072821062.d
Injection Date: 28-Jul-2021 22:45:16 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 55
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	546632	543942			99.5	50 - 150
8 PFBA			1000.00	902.59	90.3	70 - 130
D 50 13C5_PFPeA	503885	518555			102.9	50 - 150
21 PFPeA			1000.00	866.21	86.6	70 - 130
7 PFBS			884.00	844.32	95.5	70 - 130
D 44 13C3_PFBS	179569	173490			96.6	50 - 150
D 63 13C2_4:2 FTS_2	94243	92455			98.1	50 - 150
1 4:2 FTS			934.00	952.24	102	70 - 130
D 49 13C5_PFHxA	629624	618670			98.3	50 - 150
15 PFHxA			1000.00	851.39	85.1	70 - 130
22 PFPeS			938.00	897.51	95.7	70 - 130
28 GenX			2000.00	1948.62	97.4	70 - 130
D 66 13C3_GenX	1187852	1042803			87.8	50 - 150
D 47 13C4_PFHpA	481492	493490			102.5	50 - 150
13 PFHpA			1000.00	870.35	87	70 - 130
D 45 13C3_PFHxS	146388	161824			110.5	50 - 150
14 PFHxS			910.00	748.96	82.3	70 - 130
29 ADONA			942.00	783.10	83.1	70 - 130
D 64 13C2_6:2 FTS_2	82438	80542			97.7	50 - 150
2 6:2 FTS			948.00	830.99	87.7	70 - 130
20 PFOA			1000.00	943.18	94.3	70 - 130
D 53 13C8_PFOA	470743	459144			97.5	50 - 150
12 PFHpS			952.00	807.90	84.9	70 - 130
18 PFOS			928.00	905.06	97.5	70 - 130
D 54 13C8_PFOS	144963	144716			99.8	50 - 150
17 PFNA			1000.00	909.61	91	70 - 130
D 56 13C9_PFNA	590148	603015			102.2	50 - 150
30 9Cl-PF3ONS			932.00	872.21	93.6	70 - 130
D 55 13C8_PFOSA	308005	279587			90.8	50 - 150
19 PFOSA			1000.00	1002.94	100.3	70 - 130
16 PFNS			960.00	898.92	93.6	70 - 130
D 65 13C2_8:2 FTS_2	92140	75672			82.1	50 - 150
10 PFDA			1000.00	893.01	89.3	70 - 130
3 8:2 FTS			958.00	947.80	98.9	70 - 130
D 51 13C6_PFDA	611283	587385			96.1	50 - 150
D 58 d3-MeFOSAA	685228	665738			97.2	50 - 150

NO SAMPLES ASSOCIATED

Report Date: 29-Jul-2021 18:55:03 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\072821-DOD.b\072821062.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1123.60	112.4	70 - 130
9 PFDS			964.00	934.72	97	70 - 130
D 52 13C7_PFUdA	617181	567049			91.9	50 - 150
25 PFUdA			1000.00	1006.90	100.7	70 - 130
D 60 d5-EtFOSAA	639425	617124			96.5	50 - 150
5 N-EtFOSAA			1000.00	995.86	99.6	70 - 130
D 61 d7-MeFOSE	82233	77994			94.8	50 - 150
32 MeFOSE			1000.00	952.91	95.3	70 - 130
D 57 d3-MeFOSA	48879	47325			96.8	50 - 150
26 MeFOSA			1000.00	1390.30	139	70 - 130
31 11Cl-PF3OUDS			942.00	875.46	92.9	70 - 130
D 62 d9-EtFOSE	91569	89965			98.2	50 - 150
33 EtFOSE			1000.00	978.42	97.8	70 - 130
D 59 d5-EtFOSA	46046	46741			101.5	50 - 150
27 EtFOSA			1000.00	877.73	87.8	70 - 130
11 PFDoA			1000.00	843.61	84.4	70 - 130
D 38 13C2_PFDoA	634813	650327			102.4	50 - 150
4 10:2 FTS			964.00	655.75	68	70 - 130
34 PFDOS			968.00	949.33	98.1	70 - 130
24 PFTrDA			1000.00	978.87	97.9	70 - 130
23 PFTeDA			1000.00	907.70	90.8	70 - 130
D 42 13C2_PFTeDA	795642	809882			101.8	50 - 150
D 40 13C2_PFHxDA	940962	844877			89.8	50 - 150
35 PFHxDA			1000.00	1081.04	108.1	70 - 130
36 PFODA			1000.00	1032.52	103.3	70 - 130

Report Date: 02-Aug-2021 13:38:46 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
43	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58	072921055.d	ICal					Analytes	L-1	1.00		
44	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35	072921056.d	ICal					Analytes	L-2	1.00		
45	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09	072921057.d	ICal					Analytes	L-3	1.00		
46	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47	072921058.d	ICal					Analytes	L-4	1.00		
47	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21	072921059.d	ICal					Analytes	L-5	1.00		
48	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58	072921060.d	ICal					Analytes	L-6	1.00		
49	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34	072921061.d	ICal					Analytes	L-7	1.00		
50	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11	072921062.d	ICal					Analytes	L-8	1.00		
51	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49	072921063.d	ICal					Analytes	L-9	1.00		
52	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24	072921064.d	ICal					Analytes	L-10	1.00		
100	ID BLK C1	29-Jul-2021 23:33:59	072921065.d	InstBlk					Surrogates	Smp	0.1100		
53	ICV 500_SVLC-1577	29-Jul-2021 23:44:40	072921066.d	ICV					Analytes	ICV	1.00		
54	ISOMERS_SVLC-1562	29-Jul-2021 23:55:16	072921067.d	CheckStd					IsomerCheck	Smp	1.00		
55	ID IBLK A	30-Jul-2021 00:05:50	072921068.d	InstBlk					Surrogates	Smp	0.1100		
56	WG20004-013	30-Jul-2021 00:16:26	072921069.d	Client	AOPC5-14039A-071421	Aqueous	500	10113	Surrogates	Smp	0.1100		RR-100X
57	WG20004-014	30-Jul-2021 00:27:03	072921070.d	Client	AOPC3-W7-9-071421	Aqueous	1	10113	Surrogates	Smp	0.1100		
58	WG20004-015	30-Jul-2021 00:37:40	072921071.d	Client	AOPC5-WNB-14-071421	Aqueous	1	10113	Surrogates	Smp	0.1100		
59	WG20004-016	30-Jul-2021 00:48:16	072921072.d	Client	FB-06-071421	Aqueous	1	10113	Surrogates	Smp	0.1100		
70	ID CCV 1000_SVLC-1573	30-Jul-2021 02:45:10	072921083.d	CCV					Analytes	L-5	1.00		

Report Date: 02-Aug-2021 13:38:46 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072921055.d	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58
2	072921056.d	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35
3	072921057.d	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09
4	072921058.d	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47
5	072921059.d	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21
6	072921060.d	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58
7	072921061.d	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34
8	072921062.d	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11
9	072921063.d	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49
10	072921064.d	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.360	3.620	3.731	3.635	3.786	3.519	3.680	3.690	3.807	3.698	3.652	3.399-4.172	0.12877	1.893
1 4:2 FTS	Disabled	1.454	1.076	1.274	1.420	1.628	1.702	1.635	1.624	1.647	1.495	0.710-2.129	0.23656	0.710
15 PFHxA	19.855	17.942	19.352	15.794	17.500	18.355	17.183	16.314	15.519	16.855	17.466	13.282-21.717	1.40585	8.750
22 PFPeS	4.166	3.656	2.941	3.279	3.441	3.653	3.161	3.396	3.288	3.021	3.400	2.366-4.515	0.35821	1.720
28 GenX	0.726	0.715	0.620	0.655	0.649	0.667	0.707	0.639	0.685	0.667	0.673	0.545-0.752	0.03462	0.324
13 PFHpA	3.545	4.076	3.520	3.745	3.422	3.781	3.636	3.460	3.529	3.303	3.601	2.770-4.073	0.21729	1.711
14 PFHxS	4.089	3.420	3.197	3.395	3.682	3.123	3.306	3.403	3.335	3.385	3.433	2.704-4.659	0.32585	1.841
29 ADONA	2.411	3.197	2.230	2.722	2.487	2.383	2.534	2.499	2.348	2.293	2.510	1.690-3.283	0.26565	1.243
2 6:2 FTS	1.544	1.415	1.318	1.333	1.439	1.651	1.445	1.517	1.488	1.566	1.471	1.135-1.742	0.10107	0.719
20 PFOA	2.369	3.069	2.625	2.637	2.935	2.749	2.783	2.612	2.949	2.630	2.735	2.349-3.520	0.19528	1.467
12 PFHpS	3.303	4.277	3.960	4.230	3.560	3.424	3.677	3.423	3.482	3.522	3.685	2.364-4.755	0.39860	1.780
17 PFNA	5.155	4.532	5.197	5.775	5.035	5.037	4.970	4.790	4.869	4.773	5.013	4.083-5.986	0.31730	2.517
18 PFOS	2.360	3.487	3.794	4.285	4.052	3.602	3.979	3.934	4.283	4.039	3.781	2.380-5.723	0.55712	2.026
19 PFOSA	36.660	54.477	49.337	43.319	38.144	43.480	41.837	40.644	40.015	42.118	43.003	22.229-54.058	5.30487	19.072
3 8:2 FTS	0.901	1.419	1.657	1.636	1.465	1.282	1.558	1.777	1.450	1.482	1.462	0.775-2.154	0.22994	0.732
16 PFNS	2.901	3.727	3.253	2.972	3.229	3.465	3.124	3.322	3.239	3.271	3.250	2.546-3.911	0.22750	1.614
10 PFDA	11.856	9.501	8.798	8.965	10.958	10.464	10.182	10.664	11.427	10.442	10.325	8.040-13.875	0.97236	5.479
6 N-MeFOSAA	1.326	1.483	1.586	1.393	1.475	1.482	1.497	1.514	1.528	1.450	1.473	1.213-1.736	0.08701	0.737
9 PFDS	2.262	2.401	2.838	2.945	3.357	3.111	3.073	3.099	3.086	3.299	2.947	2.267-4.446	0.36301	1.678
25 PFUdA	9.284	8.332	10.175	10.601	10.112	11.001	10.912	10.650	10.009	9.800	10.087	7.661-12.562	0.81671	5.056
5 N-EtFOSAA	1.412	1.259	1.572	1.782	1.781	1.703	1.604	1.648	1.740	1.760	1.626	1.085-2.476	0.23180	0.890
26 MeFOSA	Disabled	Disabled	1.164	1.186	1.152	1.123	1.127	1.151	1.112	1.065	1.135	1.040-1.263	0.03725	0.576
27 EtFOSA	1.048	0.983	0.997	1.041	1.048	1.102	1.099	1.047	1.027	1.034	1.042	0.934-1.161	0.03770	0.524
11 PFDoA	6.961	6.661	7.335	7.540	7.924	7.336	7.793	7.769	8.016	7.412	7.474	6.512-9.335	0.47060	3.962
4 10:2 FTS	1.816	1.482	2.612	2.290	2.371	2.405	2.542	2.411	2.366	2.444	2.273	1.331-3.410	0.34662	1.185
34 PFDOS	3.772	3.251	3.371	3.329	3.546	3.234	3.309	3.377	3.393	3.400	3.398	3.066-4.025	0.15990	1.773
24 PFTrDA	3.156	3.039	3.044	3.265	3.146	3.359	3.381	3.321	3.560	3.574	3.284	2.592-3.699	0.18448	1.573
23 PFTeDA	7.534	9.237	9.684	9.563	9.231	9.040	9.368	9.421	9.304	9.135	9.151	7.501-10.960	0.57655	4.615
35 PFHxDA	13.360	12.048	12.444	13.555	12.860	12.627	12.344	12.816	12.248	12.362	12.666	11.341-14.378	0.50621	6.430
36 PFODA	100.909	97.395	92.292	96.826	96.792	99.536	97.529	102.185	103.562	116.551	100.357	76.367-117.21(	6.80801	48.396

Report Date: 02-Aug-2021 13:38:46 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072921055.d	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58
2	072921056.d	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35
3	072921057.d	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09
4	072921058.d	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47
5	072921059.d	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21
6	072921060.d	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58
7	072921061.d	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34
8	072921062.d	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11
9	072921063.d	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49
10	072921064.d	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	919	912	945	905	991	861	794	789	781	834	Avg:A Wt:C2	873		RSD=8.3	
	105.2	104.5	108.2	103.7	113.5	98.6	90.9	90.4	89.5	95.5	Org:N Dep:R				
8 PFBA	1.117562	1.109917	1.027804	1.038681	0.940594	1.034473	1.042349	1.046906	0.997873	0.985758	Avg:A Wt:C2	1.034192		RSD=5.1	
	108.1	107.3	99.4	100.4	90.9	100	100.8	101.2	96.5	95.3	Org:N Dep:R				
D 50 13C5_PFPeA	905	949	957	923	982	916	830	833	769	898	Avg:A Wt:C2	896		RSD=7.4	
	101	105.9	106.8	103	109.6	102.2	92.6	92.9	85.8	100.2	Org:N Dep:R				
21 PFPeA	1.136462	0.996266	0.978572	0.992582	0.948943	0.990005	0.995857	0.976353	0.996882	0.925980	Avg:A Wt:C2	0.993790		RSD=5.6	
	114.4	100.2	98.5	99.9	95.5	99.6	100.2	98.2	100.3	93.2	Org:N Dep:R				
D 44 13C3_PFBS	267	303	301	282	321	274	274	261	244	268	Avg:A Wt:C2	280		RSD=8.1	
	95.5	108.4	107.7	100.9	114.8	98	97.9	93.5	87.5	95.9	Org:N Dep:R				
7 PFBS	1.568105	1.360222	1.338250	1.381944	1.225172	1.390022	1.269246	1.310064	1.420064	1.446640	Avg:A Wt:C2	1.370973		RSD=7.0	
	114.4	99.2	97.6	100.8	89.4	101.4	92.6	95.6	103.6	105.5	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	Disabled	1.489956	1.829572	1.573699	1.646870	1.419128	1.663149	1.779878	1.635544	1.878182	Avg:A Wt:C2	1.657331		RSD=9.2	
	Disabled	89.9	110.4	95	99.4	85.6	100.4	107.4	98.7	113.3	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	35.1322	37.7546	36.1536	38.0410	36.3918	46.4780	36.0392	34.9840	32.5998	36.1184	Avg:A Wt:C2	36.9693		RSD=9.9	
	95	102.1	97.8	102.9	98.4	125.7	97.5	94.6	88.2	97.7	Org:N Dep:R				
D 49 13C5_PFHxA	850	865	832	804	893	769	692	719	733	782	Avg:A Wt:C2	794		RSD=8.4	
	107	108.9	104.8	101.3	112.5	96.9	87.2	90.6	92.3	98.5	Org:N Dep:R				
15 PFHxA	1.089820	0.940282	0.993069	0.938144	0.809539	1.001720	1.058684	0.939397	0.852004	0.944254	Avg:A Wt:C2	0.956691		RSD=8.9	
	113.9	98.3	103.8	98.1	84.6	104.7	110.7	98.2	89.1	98.7	Org:N Dep:R				
22 PFPeS	1.005193	0.943533	0.947579	1.066049	0.904779	1.078676	0.905778	0.984750	1.022638	0.965140	Avg:A Wt:C2	0.982412		RSD=6.2	
	102.3	96	96.5	108.5	92.1	109.8	92.2	100.2	104.1	98.2	Org:N Dep:R				
28 GenX	0.747021	0.704963	0.722298	0.698219	0.629841	0.650503	0.668384	0.626247	0.655331	0.686243	Avg:A Wt:C2	0.678905		RSD=5.9	
	110	103.8	106.4	102.8	92.8	95.8	98.5	92.2	96.5	101.1	Org:N Dep:R				
D 66 13C3_GenX	183	189	186	190	190	189	166	167	166	174	Avg:A Wt:C2	180		RSD=5.9	
	101.8	104.7	103.2	105.6	105.7	104.9	92.3	92.5	92.3	96.9	Org:N Dep:R				
13 PFHpA	1.038466	1.061863	1.033004	1.057036	0.881217	1.050935	1.028632	0.960617	1.016943	0.959947	Avg:A Wt:C2	1.008866		RSD=5.7	
	102.9	105.3	102.4	104.8	87.3	104.2	102	95.2	100.8	95.2	Org:N Dep:R				
D 47 13C4_PFHpA	866	909	845	822	922	787	711	758	698	804	Avg:A Wt:C2	812		RSD=9.4	
	106.6	111.9	104	101.2	113.6	96.9	87.6	93.3	85.9	99	Org:N Dep:R				
D 45 13C3_PFHxS	251	267	284	257	286	237	241	247	237	225	Avg:A Wt:C2	253		RSD=8.1	
	99	105.5	112.2	101.5	112.9	93.6	95.2	97.6	93.8	88.7	Org:N Dep:R				
14 PFHxS	1.250874	1.171602	1.048440	1.072622	0.959883	1.025374	1.030131	1.021963	0.998829	1.135919	Avg:A Wt:C2	1.071564		RSD=8.3	
	116.7	109.3	97.8	100.1	89.6	95.7	96.1	95.4	93.2	106	Org:N Dep:R				
29 ADONA	5.320355	5.825783	4.602910	5.354837	4.439746	4.911948	4.926321	4.437079	4.499002	5.320382	Avg:A Wt:C2	4.963836		RSD=9.6	
	107.2	117.4	92.7	107.9	89.4	99	99.2	89.4	90.6	107.2	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	36.9756	37.0388	38.3076	36.0816	34.6168	33.5626	32.3694	28.8664	29.2982	33.2728	Avg:A Wt:C2	34.0390		RSD=9.5	
	108.6	108.8	112.5	106	101.7	98.6	95.1	84.8	86.1	97.7	Org:N Dep:R				
2 6:2 FTS	5.104860	3.267186	2.303555	1.949402	2.078391	1.955647	1.725623	1.875006	1.809386	1.855609	Ln:A Wt:C2	1.767087	152	R^2=0.992	
	107	94	84.9	92.1	108.5	106.1	95.8	105.2	101.8	104.6	Org:N Dep:R			RSE=8.3	
D 53 13C8_PFOA	808	877	893	848	898	791	764	727	691	763	Avg:A Wt:C2	806		RSD=8.9	
	100.2	108.8	110.8	105.2	111.5	98.1	94.8	90.2	85.7	94.7	Org:N Dep:R				
20 PFOA	1.041830	1.101033	0.954587	0.947817	0.969180	1.028241	0.962466	0.966450	1.008652	0.978530	Avg:A Wt:C2	0.995879		RSD=4.9	
	104.6	110.6	95.9	95.2	97.3	103.2	96.6	97	101.3	98.3	Org:N Dep:R				
12 PFHpS	1.114607	1.060882	0.954519	1.032633	0.895082	1.024806	0.957003	0.889681	0.855619	1.020618	Avg:A Wt:C2	0.980545		RSD=8.5	
	113.7	108.2	97.3	105.3	91.3	104.5	97.6	90.7	87.3	104.1	Org:N Dep:R				
D 54 13C8_PFOS	220	223	230	229	231	208	203	189	187	209	Avg:A Wt:C2	213		RSD=7.7	
	103.3	104.8	108.1	107.5	108.4	97.8	95.3	88.7	87.8	98.2	Org:N Dep:R				
D 56 13C9_PFNA	882	941	886	865	946	934	788	746	746	844	Avg:A Wt:C2	858		RSD=8.8	
	102.8	109.6	103.2	100.8	110.3	108.9	91.9	87	87	98.4	Org:N Dep:R				
17 PFNA	0.862193	0.819631	0.949724	0.927812	0.758872	0.819948	0.876428	0.865211	0.817105	0.791488	Avg:A Wt:C2	0.848841		RSD=7.0	
	101.6	96.6	111.9	109.3	89.4	96.6	103.2	101.9	96.3	93.2	Org:N Dep:R				
18 PFOS	1.155811	1.073943	1.203154	1.151100	1.053701	1.056125	1.034313	1.102042	1.157890	1.074581	Avg:A Wt:C2	1.106266		RSD=5.1	
	104.5	97.1	108.8	104.1	95.2	95.5	93.5	99.6	104.7	97.1	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	2.732331	2.780855	2.753971	2.816714	2.696954	2.921204	2.640293	3.029237	2.839976	2.958412	Avg:A Wt:C2	2.816995		RSD=4.3	
	97	98.7	97.8	100	95.7	103.7	93.7	107.5	100.8	105	Org:N Dep:R				
D 55 13C8_PFOSA	451	446	539	401	436	424	395	395	388	427	Avg:A Wt:C2	430		RSD=10.3	
	104.8	103.6	125.3	93.3	101.4	98.5	91.7	91.9	90.2	99.3	Org:N Dep:R				
19 PFOSA	0.876596	0.988277	0.959957	1.050934	0.963534	1.044521	1.059039	1.008011	0.969778	1.009748	Avg:A Wt:C2	0.993039		RSD=5.5	
	88.3	99.5	96.7	105.8	97	105.2	106.6	101.5	97.7	101.7	Org:N Dep:R				
3 8:2 FTS	1.271903	1.577419	1.648727	1.681604	1.880832	1.587450	1.785352	1.846861	1.546218	1.591832	Avg:A Wt:C2	1.641820		RSD=10.7	
	77.5	96.1	100.4	102.4	114.6	96.7	108.7	112.5	94.2	97	Org:N Dep:R				
16 PFNS	0.909622	0.799248	0.886303	0.832116	0.836293	0.933963	0.817460	0.895024	0.853525	0.830234	Avg:A Wt:C2	0.859379		RSD=5.1	
	105.8	93	103.1	96.8	97.3	108.7	95.1	104.1	99.3	96.6	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	32.7128	31.7172	32.2068	30.9092	28.6502	28.8872	25.6642	26.1154	24.7406	26.2738	Avg:A Wt:C2	28.7877		RSD=10.3	
	113.6	110.2	111.9	107.4	99.5	100.3	89.1	90.7	85.9	91.3	Org:N Dep:R				
10 PFDA	0.859343	0.910199	0.938797	0.971735	0.836846	0.885091	0.869047	0.932339	0.953789	0.911567	Avg:A Wt:C2	0.906875		RSD=4.8	
	94.8	100.4	103.5	107.2	92.3	97.6	95.8	102.8	105.2	100.5	Org:N Dep:R				
D 51 13C6_PFDA	776	848	793	742	842	763	668	663	611	681	Avg:A Wt:C2	739		RSD=10.9	
	105.1	114.8	107.3	100.4	114	103.3	90.4	89.8	82.7	92.1	Org:N Dep:R				
D 58 d3-MeFOSAA	204	199	199	208	189	210	177	189	168	195	Avg:A Wt:C2	194		RSD=7.0	
	105.4	102.5	102.4	107.5	97.7	108.5	91.4	97.6	86.5	100.5	Org:N Dep:R				
6 N-MeFOSAA	0.621086	0.746568	0.832640	0.688084	0.755242	0.700697	0.741140	0.735543	0.830740	0.741960	Avg:A Wt:C2	0.739370		RSD=8.5	
	84	101	112.6	93.1	102.1	94.8	100.2	99.5	112.4	100.4	Org:N Dep:R				
9 PFDS	0.960447	0.996215	0.922270	0.755345	0.944558	1.012106	0.876702	0.891850	0.978086	0.947428	Avg:A Wt:C2	0.928501		RSD=8.0	
	103.4	107.3	99.3	81.4	101.7	109	94.4	96.1	105.3	102	Org:N Dep:R				
D 60 d5-EtFOSAA	192	201	198	183	181	169	172	155	145	159	Avg:A Wt:C2	176		RSD=10.7	
	109.1	114.6	113	104.1	103.1	96.3	98	88.5	82.5	90.7	Org:N Dep:R				
D 52 13C7_PFUdA	733	803	755	677	795	701	644	640	628	640	Avg:A Wt:C2	701		RSD=9.5	
	104.5	114.5	107.6	96.5	113.3	99.9	91.8	91.2	89.6	91.2	Org:N Dep:R				
25 PFUdA	0.851338	0.835265	0.868894	0.908367	0.824869	0.874811	0.895288	0.855057	0.806516	0.874185	Avg:A Wt:C2	0.859459		RSD=3.7	
	99.1	97.2	101.1	105.7	96	101.8	104.2	99.5	93.8	101.7	Org:N Dep:R				
5 N-EtFOSAA	0.894618	0.829951	0.841637	0.880402	0.935820	0.945955	0.873940	0.912997	0.964698	0.966311	Avg:A Wt:C2	0.904633		RSD=5.4	
	98.9	91.7	93	97.3	103.4	104.6	96.6	100.9	106.6	106.8	Org:N Dep:R				
D 61 d7-MeFOSE	188	230	197	182	195	193	165	168	162	200	Avg:A Wt:C2	188		RSD=10.9	
	100	122.7	104.6	96.8	103.6	102.9	87.7	89.2	86.2	106.3	Org:N Dep:R				
32 MeFOSE	0.922138	0.657977	0.998036	0.875348	0.856117	0.856931	0.923830	0.952265	0.953300	0.890117	Avg:A Wt:C2	0.888606		RSD=10.5	
	103.8	74	112.3	98.5	96.3	96.4	104	107.2	107.3	100.2	Org:N Dep:R				
26 MeFOSA	Disabled	Disabled	1.001035	1.115208	1.153087	1.061367	0.933944	1.007735	0.945965	0.900966	Avg:A Wt:C2	1.014914		RSD=8.8	
	Disabled	Disabled	98.6	109.9	113.6	104.6	92	99.3	93.2	88.8	Org:N Dep:R				
D 57 d3-MeFOSA	58.8040	65.8760	61.8310	61.6710	57.9930	63.2180	66.8430	62.5820	64.3520	71.4960	Avg:A Wt:C2	63.4666		RSD=6.2	
	92.7	103.8	97.4	97.2	91.4	99.6	105.3	98.6	101.4	112.7	Org:N Dep:R				
31 11Cl-PF3OUDS	2.843254	2.693439	2.696030	2.325650	2.221579	2.556787	2.327689	2.615658	2.525305	2.588903	Avg:A Wt:C2	2.539429		RSD=7.7	
	112	106.1	106.2	91.6	87.5	100.7	91.7	103	99.4	101.9	Org:N Dep:R				
D 62 d9-EtFOSE	186	173	182	177	171	193	161	164	166	187	Avg:A Wt:C2	176		RSD=6.1	
	105.9	98.3	103.6	100.3	97.3	109.4	91.4	93.2	94.5	106.1	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	0.867331	0.796699	0.838565	0.801961	0.811756	0.725371	0.806238	0.810473	0.768337	0.791518	Avg:A Wt:C2	0.801825		RSD=4.7	
	108.2	99.4	104.6	100	101.2	90.5	100.6	101.1	95.8	98.7	Org:N Dep:R				
D 59 d5-EtFOSA	63.5060	61.9050	60.6080	63.6460	53.2940	67.8640	59.6640	59.6030	55.3700	58.8160	Avg:A Wt:C2	60.4276		RSD=6.9	
	105.1	102.4	100.3	105.3	88.2	112.3	98.7	98.6	91.6	97.3	Org:N Dep:R				
27 EtFOSA	1.086197	1.068734	1.244390	1.072840	1.186775	0.960495	1.022352	0.975543	1.015711	1.063277	Avg:A Wt:C2	1.069631		RSD=8.3	
	101.5	99.9	116.3	100.3	111	89.8	95.6	91.2	95	99.4	Org:N Dep:R				
D 38 13C2_PFDoA	770	728	777	744	852	777	696	720	630	757	Avg:A Wt:C2	745		RSD=7.9	
	103.3	97.7	104.3	99.9	114.4	104.3	93.4	96.6	84.5	101.6	Org:N Dep:R				
11 PFDoA	0.971011	0.940692	0.972162	0.960895	0.870943	0.912175	0.888473	0.903382	0.924406	0.855039	Avg:A Wt:C2	0.919918		RSD=4.5	
	105.6	102.3	105.7	104.5	94.7	99.2	96.6	98.2	100.5	92.9	Org:N Dep:R				
4 10:2 FTS	2.050411	1.461961	2.080854	1.855857	2.015801	2.095664	2.110873	2.011933	1.997789	2.198098	Avg:A Wt:C2	1.987924		RSD=10.3	
	103.1	73.5	104.7	93.4	101.4	105.4	106.2	101.2	100.5	110.6	Org:N Dep:R				
34 PFDOS	1.046257	0.840101	0.941282	0.825429	0.860047	0.911089	0.844335	0.915003	0.888608	0.898809	Avg:A Wt:C2	0.897096		RSD=7.2	
	116.6	93.6	104.9	92	95.9	101.6	94.1	102	99.1	100.2	Org:N Dep:R				
24 PFTrDA	0.405526	0.422982	0.417964	0.412817	0.354926	0.394006	0.403250	0.379297	0.442407	0.419323	Avg:A Wt:C2	0.405250		RSD=6.1	
	100.1	104.4	103.1	101.9	87.6	97.2	99.5	93.6	109.2	103.5	Org:N Dep:R				
D 42 13C2_PFTeDA	774	807	798	789	863	737	716	717	702	761	Avg:A Wt:C2	766		RSD=6.5	
	100.9	105.3	104.1	102.9	112.6	96.1	93.4	93.6	91.6	99.4	Org:N Dep:R				
23 PFTeDA	0.831424	0.832838	0.839564	0.843284	0.749073	0.825176	0.795402	0.792779	0.775340	0.796596	Avg:A Wt:C2	0.808148		RSD=3.9	
	102.9	103.1	103.9	104.3	92.7	102.1	98.4	98.1	95.9	98.6	Org:N Dep:R				
35 PFHxDA	1.725518	1.536590	1.508953	1.442554	1.461620	1.423085	1.364325	1.373765	1.357098	1.361539	Avg:A Wt:C2	1.455505		RSD=7.8	
	118.6	105.6	103.7	99.1	100.4	97.8	93.7	94.4	93.2	93.5	Org:N Dep:R				
D 40 13C2_PFHxDA	510	520	523	515	495	482	463	450	435	489	Avg:A Wt:C2	488		RSD=6.3	
	104.6	106.5	107.1	105.5	101.4	98.7	94.8	92.3	89	100.1	Org:N Dep:R				
36 PFODA	1.261341	1.296078	1.311983	1.287577	1.285609	1.285139	1.259962	1.291628	1.261148	1.450733	Avg:A Wt:C2	1.299120		RSD=4.3	
	97.1	99.8	101	99.1	99	98.9	97	99.4	97.1	111.7	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072921055.d	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58
2	072921056.d	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35
3	072921057.d	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09
4	072921058.d	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47
5	072921059.d	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21
6	072921060.d	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58
7	072921061.d	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34
8	072921062.d	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11
9	072921063.d	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49
10	072921064.d	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	702597	775202	756435	766883	777642	717575	653022	677019	618629	680746	0.78
* 39 13C2_PFHxA	766954	743212	766172	769347	752915	743998	701129	666706	679227	744788	0.73
* 41 13C2_PFOA	845054	864763	923417	859593	921637	814973	796320	753368	704232	797172	1.45
* 43 13C3_PFBA	876865	862066	888074	854177	913072	850788	760833	763819	755943	829144	1.39
* 48 13C4_PFOS	223019	230566	229794	229255	262831	215199	210769	203009	177767	213861	1.04

13C2_PFDA ((|680746 - 702597| / (680746 + 702597)) / 2) * 100 = 0.79
13C2_PFHxA ((|744788 - 766954| / (744788 + 766954)) / 2) * 100 = 0.73
13C2_PFOA ((|797172 - 845054| / (797172 + 845054)) / 2) * 100 = 1.46
13C3_PFBA ((|829144 - 876865| / (829144 + 876865)) / 2) * 100 = 1.40
13C4_PFOS ((|213861 - 223019| / (213861 + 223019)) / 2) * 100 = 1.05

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072921055.d	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58
2	072921056.d	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35
3	072921057.d	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09
4	072921058.d	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47
5	072921059.d	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21
6	072921060.d	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58
7	072921061.d	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34
8	072921062.d	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11
9	072921063.d	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49
10	072921064.d	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	918607	912230	945015	905350	990916	861103	794012	789415	781296	833635	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	51330	101250	194258	470185	932050	1781575	4138188	8264434	11694509	16435250	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	904755	948723	957078	923106	982365	915592	829600	832611	769154	897501	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	51411	94518	187314	458129	932208	1812882	4130816	8129221	11501337	16621356	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	266887	302960	300952	282113	320750	273908	273633	261361	244490	267974	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	18498	36429	71206	172320	347389	673145	1535099	3026813	4603757	6853861	
1 4:2 FTS	Disabled	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	Disabled	5254	12356	27957	55977	123210	279913	581576	746991	1267194	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	175661	188773	180768	190205	181959	232390	180196	174920	162999	180592	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	849755	864996	832017	804241	893485	769489	692494	719193	732511	781771	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	766954	743212	766172	769347	752915	743998	701129	666706	679227	744788	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	46304	81334	165250	377247	723311	1541625	3665662	6756075	9361538	14763806	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	12582	26813	53499	141050	272215	554279	1162420	2414181	3517847	4851944	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	13690	26580	53697	132701	239675	491459	1110565	2086266	3265089	4789121	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	916306	942603	929274	950282	951332	944382	830784	832845	830392	872344	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	44963	96491	174611	434364	812867	1654704	3658833	7282700	10647622	15440713	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	865950	908695	845161	821853	922437	787253	711398	758127	698015	804248	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	250550	267090	284169	257004	285748	237059	241054	247175	237434	224667	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	14260	28476	54224	125429	249599	442395	1129843	2298694	3237178	4644702	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	62785	146576	246428	648197	1195067	2193770	5593169	10331244	15093892	22519720	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	184878	185194	191538	180408	173084	167813	161847	144332	146491	166364	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	8947	11472	16731	33340	68206	124447	264764	513102	753827	1170615	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	845054	864763	923417	859593	921637	814973	796320	753368	704232	797172	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	807656	876559	892595	847588	898114	790701	764265	726541	690896	762870	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	42072	96512	170412	401679	870434	1626063	3677897	7021656	10453108	14929830	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	13293	26975	51645	126326	243491	462557	1098081	2093514	2901026	4365855	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	220009	223335	230393	229007	231032	208346	203133	188931	187064	209237	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	881937	940533	885568	865134	946451	934300	788064	746408	746357	843733	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	38020	77089	168209	401341	718235	1532154	3453405	6458007	9147781	13356092	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	11799	22258	51448	122315	225911	408393	974878	1932188	3015066	4173071	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	223019	230566	229794	229255	262831	215199	210769	203009	177767	213861	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	28013	57883	118270	300592	580713	1134470	2499301	5333993	7426977	11538334	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	450835	445948	539394	401479	436299	424099	394545	395436	388263	427240	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	19760	44072	103559	210964	420389	885961	2089193	3986038	5647934	8628093	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1993	4793	10174	24897	51623	87862	219476	462058	549715	801338	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	9606	17136	39206	91469	185482	373608	797055	1623338	2299159	3335339	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	163564	158586	161034	154546	143251	144436	128321	130577	123703	131369	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	702597	775202	756435	766883	777642	717575	653022	677019	618629	680746	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	33353	77210	148887	360540	704533	1350741	2903296	6183307	8740562	12410105	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	776244	848276	792967	742054	841891	763052	668156	663204	610936	680702	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1022080	993546	992686	1042125	946710	1051243	886046	946284	837988	974242	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	6348	14835	33062	71707	142999	294641	656684	1392065	2088451	2891394	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	10185	21448	40967	83376	210367	406554	858380	1624321	2645669	3822008	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	957504	1006204	991609	913674	904763	845278	860373	776827	724418	795900	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	732893	803230	755029	676929	794661	700826	643672	639520	628219	640015	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	31197	67091	131208	307450	655491	1226180	2881360	5468259	7600027	11189824	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	8566	16702	33383	80440	169339	319838	751914	1418482	2096533	3076348	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	187846	230464	196566	181859	194596	193197	164656	167501	161958	199682	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	8661	15164	39236	79595	166597	331113	760571	1595053	2315918	3554807	
26 MeFOSA	Disabled	Disabled	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	Disabled	Disabled	12379	34388	66871	134195	312138	630661	913121	1288310	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	58804	65876	61831	61671	57993	63218	66843	62582	64352	71496	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	29463	56665	117024	250850	483487	1003600	2227031	4655165	6674923	10205520	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	186434	173177	182377	176632	171262	192711	160926	164045	166388	186889	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	8085	13797	30587	70826	139023	279574	648723	1329541	1917632	2958521	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	63506	61905	60608	63646	53294	67864	59664	59603	55370	58816	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3449	6616	15084	34141	63248	130366	304988	581453	843599	1250754	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	769569	727762	776897	744098	852283	777429	696141	720069	629624	757403	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	37363	68460	151054	357500	742290	1418302	3092514	6504974	8730427	12952175	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3233	4470	12921	27649	55674	116717	261118	506509	714707	1113466	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	11141	18162	41985	91490	192340	367495	830120	1673405	2413611	3640919	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	15604	30783	64943	153588	302497	612624	1403595	2731199	4178249	6351925	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	773516	807288	798117	788911	863033	736570	716022	716949	701873	761478	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	32156	67234	134014	332638	646475	1215600	2847628	5683823	8162854	12131800	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	44036	79905	157736	371656	723869	1371811	3156742	6187876	8847145	13303298	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	510409	520015	522667	515275	495251	481985	462755	450432	434611	488539	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	32190	67398	137146	331728	636699	1238835	2915268	5817904	8221629	14174796	

Report Date: 02-Aug-2021 13:38:46 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072921055.d	ICAL 50_SVLC-1545A	29-Jul-2021 21:47:58
2	072921056.d	ICAL 100_SVLC-1546	29-Jul-2021 21:58:35
3	072921057.d	ICAL 200_SVLC-1547	29-Jul-2021 22:09:09
4	072921058.d	ICAL 500_SVLC-1548	29-Jul-2021 22:19:47
5	072921059.d	ICAL 1000_SVLC-1573	29-Jul-2021 22:30:21
6	072921060.d	ICAL 2000_SVLC-1550	29-Jul-2021 22:40:58
7	072921061.d	ICAL 5000_SVLC-1551	29-Jul-2021 22:51:34
8	072921062.d	ICAL 10000_SVLC-1552	29-Jul-2021 23:02:11
9	072921063.d	ICAL 15000_SVLC-1553	29-Jul-2021 23:12:49
10	072921064.d	ICAL 20000_SVLC-1554	29-Jul-2021 23:23:24

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.713	1.713	1.719	1.712	1.712	1.712	1.712	1.712	1.712	1.713	1.713	0.129
8 PFBA	1.719	1.719	1.719	1.719	1.719	1.719	1.712	1.712	1.712	1.719	1.717	0.183
D 50 13C5_PFPeA	2.077	2.077	2.077	2.076	2.076	2.076	2.076	2.076	2.076	2.077	2.076	0.000
21 PFPeA	2.077	2.077	2.087	2.076	2.076	2.076	2.076	2.076	2.076	2.077	2.077	0.167
D 44 13C3_PFBS	2.140	2.129	2.139	2.129	2.129	2.129	2.129	2.129	2.129	2.129	2.130	0.216
7 PFBS	2.129	2.139	2.139	2.129	2.129	2.129	2.129	2.129	2.129	2.129	2.130	0.216
1 4:2 FTS	Disabled	2.406	2.414	2.405	2.414	2.405	2.405	2.414	2.414	2.414	2.410	0.197
D 63 13C2_4:2 FTS_2	2.414	2.414	2.414	2.414	2.414	2.405	2.405	2.405	2.405	2.414	2.410	0.190
D 49 13C5_PFHxA	2.458	2.458	2.458	2.449	2.449	2.449	2.449	2.449	2.449	2.458	2.452	0.190
* 39 13C2_PFHxA	2.458	2.458	2.458	2.457	2.449	2.449	2.449	2.449	2.449	2.449	2.452	0.190
15 PFHxA	2.458	2.449	2.458	2.449	2.449	2.449	2.449	2.449	2.458	2.458	2.452	0.186
22 PFPeS	2.493	2.492	2.492	2.492	2.484	2.484	2.484	2.484	2.484	2.492	2.488	0.191
28 GenX	2.579	2.578	2.578	2.578	2.570	2.570	2.570	2.578	2.570	2.571	2.574	0.160
D 66 13C3_GenX	2.579	2.578	2.571	2.570	2.570	2.570	2.570	2.570	2.570	2.571	2.572	0.131
13 PFHpA	2.845	2.845	2.845	2.835	2.836	2.836	2.836	2.836	2.836	2.836	2.838	0.153
D 47 13C4_PFHpA	2.845	2.836	2.845	2.835	2.836	2.836	2.836	2.836	2.836	2.836	2.837	0.134
D 45 13C3_PFHxS	2.854	2.853	2.854	2.853	2.853	2.844	2.853	2.853	2.853	2.853	2.852	0.099
14 PFHxS	2.862	2.853	2.854	2.853	2.853	2.844	2.853	2.853	2.853	2.853	2.853	0.149
29 ADONA	2.880	2.880	2.880	2.879	2.880	2.871	2.880	2.880	2.880	2.880	2.878	0.101
D 64 13C2_6:2 FTS_2	3.202	3.202	3.202	3.204	3.189	3.196	3.195	3.195	3.195	3.196	3.197	0.150
2 6:2 FTS	3.196	3.202	3.196	3.198	3.196	3.196	3.195	3.195	3.202	3.196	3.197	0.085
* 41 13C2_PFOA	3.221	3.221	3.228	3.223	3.221	3.215	3.221	3.221	3.221	3.221	3.221	0.099
D 53 13C8_PFOA	3.221	3.221	3.221	3.223	3.221	3.221	3.221	3.221	3.221	3.221	3.221	0.029
20 PFOA	3.228	3.228	3.228	3.223	3.221	3.221	3.227	3.227	3.221	3.221	3.224	0.101
12 PFHpS	3.234	3.234	3.228	3.230	3.227	3.227	3.227	3.227	3.227	3.227	3.229	0.084
D 54 13C8_PFOS	3.602	3.594	3.594	3.590	3.587	3.594	3.593	3.586	3.593	3.594	3.592	0.124
D 56 13C9_PFNA	3.602	3.602	3.602	3.597	3.594	3.594	3.593	3.594	3.600	3.594	3.597	0.103
17 PFNA	3.602	3.594	3.602	3.597	3.594	3.601	3.600	3.601	3.600	3.594	3.598	0.091
18 PFOS	3.602	3.602	3.594	3.590	3.594	3.594	3.593	3.594	3.600	3.594	3.595	0.113
* 48 13C4_PFOS	3.594	3.594	3.594	3.590	3.601	3.594	3.593	3.594	3.593	3.594	3.594	0.084
30 9Cl-PF3ONS	3.797	3.796	3.796	3.792	3.796	3.796	3.796	3.796	3.796	3.796	3.796	0.042
D 55 13C8_PFOSA	3.886	3.885	3.885	3.881	3.885	3.885	3.885	3.885	3.885	3.885	3.885	0.041
19 PFOSA	3.886	3.885	3.878	3.881	3.885	3.885	3.885	3.885	3.885	3.885	3.884	0.073

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
3 8:2 FTS	3.931	3.931	3.931	3.926	3.923	3.939	3.931	3.923	3.931	3.931	3.929	0.123
16 PFNS	3.923	3.923	3.923	3.926	3.923	3.923	3.931	3.931	3.923	3.923	3.924	0.081
D 65 13C2_8:2 FTS_2	3.931	3.931	3.931	3.926	3.931	3.931	3.931	3.931	3.931	3.931	3.930	0.045
* 37 13C2_PFDA	3.939	3.939	3.939	3.934	3.939	3.939	3.939	3.939	3.939	3.939	3.938	0.044
10 PFDA	3.947	3.939	3.939	3.934	3.939	3.939	3.931	3.939	3.939	3.939	3.938	0.111
D 51 13C6_PFDA	3.939	3.939	3.939	3.934	3.939	3.939	3.939	3.939	3.939	3.939	3.938	0.044
D 58 d3-MeFOSAA	4.093	4.093	4.093	4.087	4.093	4.093	4.093	4.093	4.093	4.093	4.092	0.054
6 N-MeFOSAA	4.102	4.093	4.102	4.095	4.101	4.101	4.093	4.093	4.093	4.093	4.096	0.100
9 PFDS	4.235	4.226	4.226	4.219	4.226	4.225	4.225	4.225	4.225	4.226	4.225	0.091
D 60 d5-EtFOSAA	4.245	4.245	4.245	4.247	4.245	4.244	4.244	4.244	4.244	4.245	4.244	0.022
D 52 13C7_PFUdA	4.245	4.245	4.245	4.238	4.245	4.244	4.235	4.244	4.244	4.245	4.242	0.086
25 PFUdA	4.254	4.245	4.245	4.247	4.245	4.244	4.244	4.244	4.244	4.245	4.245	0.075
5 N-EtFOSAA	4.254	4.254	4.254	4.257	4.254	4.254	4.254	4.254	4.254	4.254	4.254	0.022
D 61 d7-MeFOSE	4.301	4.292	4.292	4.294	4.301	4.291	4.301	4.300	4.301	4.301	4.297	0.103
32 MeFOSE	4.310	4.310	4.301	4.303	4.310	4.301	4.301	4.310	4.310	4.310	4.306	0.107
26 MeFOSA	Disabled	Disabled	4.319	4.322	4.319	4.319	4.319	4.319	4.319	4.319	4.319	0.016
D 57 d3-MeFOSA	4.320	4.319	4.310	4.312	4.319	4.319	4.319	4.319	4.319	4.319	4.317	0.079
31 11Cl-PF3OUDS	4.383	4.383	4.383	4.385	4.383	4.382	4.382	4.382	4.382	4.382	4.382	0.014
D 62 d9-EtFOSE	4.457	4.457	4.457	4.458	4.457	4.456	4.456	4.456	4.456	4.456	4.456	0.014
33 EtFOSE	4.473	4.473	4.465	4.466	4.473	4.464	4.473	4.473	4.473	4.473	4.470	0.082
D 59 d5-EtFOSA	4.481	4.481	4.473	4.475	4.481	4.481	4.473	4.481	4.481	4.481	4.478	0.085
27 EtFOSA	4.489	4.489	4.489	4.491	4.489	4.481	4.489	4.489	4.489	4.489	4.488	0.064
D 38 13C2_PFDoA	4.514	4.506	4.514	4.507	4.506	4.505	4.514	4.505	4.514	4.514	4.509	0.090
11 PFDoA	4.514	4.514	4.506	4.507	4.514	4.505	4.505	4.513	4.514	4.514	4.510	0.087
4 10:2 FTS	4.522	4.530	4.522	4.515	4.522	4.514	4.522	4.522	4.522	4.522	4.521	0.099
34 PFDOS	4.721	4.720	4.720	4.722	4.720	4.720	4.720	4.720	4.720	4.720	4.720	0.013
24 PFTrDA	4.745	4.745	4.751	4.747	4.751	4.745	4.745	4.745	4.751	4.745	4.746	0.064
D 42 13C2_PFTeDA	4.966	4.966	4.966	4.967	4.966	4.957	4.966	4.965	4.966	4.966	4.964	0.054
23 PFTeDA	4.966	4.966	4.966	4.967	4.966	4.965	4.966	4.965	4.966	4.966	4.965	0.013
35 PFHxDA	5.357	5.357	5.357	5.352	5.348	5.348	5.357	5.348	5.348	5.357	5.352	0.082
D 40 13C2_PFHxDA	5.348	5.348	5.348	5.352	5.348	5.348	5.348	5.348	5.348	5.348	5.348	0.021
36 PFODA	5.723	5.723	5.723	5.726	5.723	5.723	5.723	5.722	5.723	5.723	5.722	0.022

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\072921-DOD ICAL.b\072921066.d
Injection Date: 29-Jul-2021 23:44:40 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 53
Sample Info: ICV 500_SVLC-1577 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Stephen E. Somerville

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	990916	1068339			107.8	50 - 150
8 PFBA			500.00	417.83	83.6	70 - 130
D 50 13C5_PFPeA	982365	1076657			109.6	50 - 150
21 PFPeA			500.00	417.62	83.5	70 - 130
7 PFBS			442.50	383.15	86.6	70 - 130
D 44 13C3_PFBS	320750	313252			97.7	50 - 150
1 4:2 FTS			467.50	429.44	91.9	70 - 130
D 63 13C2_4:2 FTS_2	181959	192442			105.8	50 - 150
D 49 13C5_PFHxA	893485	961683			107.6	50 - 150
15 PFHxA			500.00	415.13	83	70 - 130
22 PFPeS			470.00	425.87	90.6	70 - 130
28 GenX			2500.00	2008.54	80.3	70 - 130
D 66 13C3_GenX	951332	980291			103	50 - 150
D 47 13C4_PFHpA	922437	1003643			108.8	50 - 150
13 PFHpA			500.00	401.18	80.2	70 - 130
D 45 13C3_PFHxS	285748	323636			113.3	50 - 150
14 PFHxS			456.00	346.39	76	70 - 130
29 ADONA			2355.00	1824.53	77.5	70 - 130
D 64 13C2_6:2 FTS_2	173084	178860			103.3	50 - 150
2 6:2 FTS			475.00	438.13	92.2	70 - 130
20 PFOA			500.00	423.40	84.7	70 - 130
D 53 13C8_PFOA	898114	969364			107.9	50 - 150
12 PFHpS			475.00	345.13	72.7	70 - 130
D 54 13C8_PFOS	231032	259386			112.3	50 - 150
18 PFOS			462.75	395.59	85.5	70 - 130
17 PFNA			500.00	392.71	78.5	70 - 130
D 56 13C9_PFNA	946451	1090151			115.2	50 - 150
30 9Cl-PF3ONS			2330.00	1822.40	78.2	70 - 130
D 55 13C8_PFOSA	436299	466366			106.9	50 - 150
19 PFOSA			500.00	498.06	99.6	70 - 130
16 PFNS			480.00	446.86	93.1	70 - 130
3 8:2 FTS			480.00	415.63	86.6	70 - 130
D 65 13C2_8:2 FTS_2	143251	170180			118.8	50 - 150
10 PFDA			500.00	438.58	87.7	70 - 130
D 51 13C6_PFDA	841891	947969			112.6	50 - 150
D 58 d3-MeFOSAA	946710	931934			98.4	50 - 150

Report Date: 02-Aug-2021 13:38:39 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\organics\LL\LCMSMS01.i\072921-DOD ICAL.b\072921066.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	631.26	126.3	70 - 130
9 PFDS			482.50	394.96	81.9	70 - 130
25 PFUdA			500.00	430.91	86.2	70 - 130
D 60 d5-EtFOSAA	904763	1028927			113.7	50 - 150
D 52 13C7_PFUdA	794661	891262			112.2	50 - 150
5 N-EtFOSAA			500.00	589.46	117.9	70 - 130
D 61 d7-MeFOSE	194596	220176			113.1	50 - 150
D 57 d3-MeFOSA	57993	69256			119.4	50 - 150
31 11Cl-PF3OUDS			2355.00	1770.74	75.2	70 - 130
D 62 d9-EtFOSE	171262	205532			120	50 - 150
D 59 d5-EtFOSA	53294	61981			116.3	50 - 150
D 38 13C2_PFDoA	852283	1067440			125.2	50 - 150
11 PFDoA			500.00	368.78	73.8	70 - 130
4 10:2 FTS			2410.00	2480.87	102.9	70 - 130
24 PFTrDA			500.00	380.82	76.2	70 - 130
23 PFTeDA			500.00	437.57	87.5	70 - 130
D 42 13C2_PFTeDA	863033	948361			109.9	50 - 150
D 40 13C2_PFHxDA	495251	579184			116.9	50 - 150

Report Date: 30-Jul-2021 16:54:07 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

NO SAMPLE ASSOCIATED

Batch: \\Organics\LL\LCMSMS02.i\072921-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	29-Jul-2021 12:18:57	072921005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	29-Jul-2021 12:29:34	072921006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	29-Jul-2021 12:40:08	072921007.d	InstBlk					Surrogates	Smp	0.1100		
1	WG28013-001	29-Jul-2021 12:50:46	072921008.d	Client	AFFF21-SB20-00-0727-00-T	Soil	50	10344	Surrogates	Smp	0.1100		RR-1X
2	WG28013-002	29-Jul-2021 13:01:24	072921009.d	Client	AFFF21-SB20-06-0727-00-T	Soil	50	10344	Surrogates	Smp	0.1100		RR-1X
3	WG28013-003	29-Jul-2021 13:12:00	072921010.d	Client	AFFF21-SB20-18-0727-00-T	Soil	50	10344	Surrogates	Smp	0.1100		RR-1X
4	WG28013-004	29-Jul-2021 13:22:37	072921011.d	Client	AFFF21-SB20-12-0727-00-T	Soil	50	10344	Surrogates	Smp	0.1100		RR-1X
5	ID CCV 1000A_SVLC-1573	29-Jul-2021 13:33:11	072921012.d	CCV					Analytes	L-5	1.00		
6	CCB 1	29-Jul-2021 13:43:47	072921013.d	InstBlk					Surrogates	Smp	0.1100		
7	WQ10068-001	29-Jul-2021 13:54:25	072921014.d	MBlk		Soil	1	10068	Surrogates	Smp	0.1100		
8	WQ10068-002	29-Jul-2021 14:05:08	072921015.d	LCS		Soil	1	10068	Analytes	100x PDS	0.1000		
9	WQ10344-001	29-Jul-2021 14:15:47	072921016.d	MBlk		Soil	1	10344	Surrogates	Smp	0.1100		
10	WQ10344-002	29-Jul-2021 14:26:26	072921017.d	LCS		Soil	1	10344	Analytes	100x PDS	0.1000		
11	WQ10346-001	29-Jul-2021 14:37:08	072921018.d	MBlk		Aqueous	1	10346	Surrogates	Smp	0.1100		
12	WQ10346-002	29-Jul-2021 14:47:41	072921019.d	LCS		Aqueous	1	10346	Analytes	100x PDS	0.2000		
13	WG28013-005	29-Jul-2021 14:58:15	072921020.d	Client	AFFF21-FRB-01-0727-T4	Aqueous	1	10346	Surrogates	Smp	0.1100		
14	WG22019-003	29-Jul-2021 15:08:49	072921021.d	Client	RRAD-FFTA-02-SE-072021	Soil	1	10065	Surrogates	Smp	0.1100		RR-10X(8:2)
15	WG22019-005	29-Jul-2021 15:19:25	072921022.d	Client	RRAD-FFTA-06-S0-072021	Soil	1	10065	Surrogates	Smp	0.1100		
16	WG22019-005MS	29-Jul-2021 15:30:04	072921023.d	MS		Soil	1	10065	Analytes	100x PDS	0.1000		
17	WG22019-005MD	29-Jul-2021 15:40:40	072921024.d	MSD		Soil	1	10065	Analytes	100x PDS	0.1000		
18	WG22019-006	29-Jul-2021 15:51:16	072921025.d	Client	RRAD-FFTA-07-S0-072021	Soil	1	10065	Surrogates	Smp	0.1100		
19	WG22019-007	29-Jul-2021 16:01:52	072921026.d	Client	RRAD-FFTA-08-S0-072021	Soil	1	10065	Surrogates	Smp	0.1100		
20	WG22023-001	29-Jul-2021 16:12:32	072921027.d	Client	RRAD-IDW-SO-072021	Soil	1	10065	Surrogates	Smp	0.1100		
21	WG28013-001	29-Jul-2021 16:23:11	072921028.d	Client	AFFF21-SB20-00-0727-00-T	Soil	1	10344	Surrogates	Smp	0.1100		
22	WG28013-002	29-Jul-2021 16:33:47	072921029.d	Client	AFFF21-SB20-06-0727-00-T	Soil	1	10344	Surrogates	Smp	0.1100		
23	WG28013-003	29-Jul-2021 16:44:20	072921030.d	Client	AFFF21-SB20-18-0727-00-T	Soil	1	10344	Surrogates	Smp	0.1100		
24	WG28013-004	29-Jul-2021 16:55:01	072921031.d	Client	AFFF21-SB20-12-0727-00-T	Soil	1	10344	Surrogates	Smp	0.1100		
25	ID CCV 1000A_SVLC-1573	29-Jul-2021 17:05:41	072921032.d	CCV					Analytes	L-5	1.00		
26	CCB 2	29-Jul-2021 17:16:19	072921033.d	InstBlk					Surrogates	Smp	0.1100		
27	WG21049-017	29-Jul-2021 17:26:55	072921034.d	Client	218	Soil	1	10068	Surrogates	Smp	0.1100		
28	WG21049-018	29-Jul-2021 17:37:37	072921035.d	Client	220	Soil	1	10068	Surrogates	Smp	0.1100		
29	WG21049-019	29-Jul-2021 17:48:13	072921036.d	Client	222	Soil	1	10068	Surrogates	Smp	0.1100		
30	WG21049-020	29-Jul-2021 17:58:51	072921037.d	Client	224	Soil	1	10068	Surrogates	Smp	0.1100		
31	WG21049-021	29-Jul-2021 18:09:31	072921038.d	Client	226	Soil	1	10068	Surrogates	Smp	0.1100		RR-5X(BA)
32	WG21049-022	29-Jul-2021 18:20:05	072921039.d	Client	227	Soil	1	10068	Surrogates	Smp	0.1100		
33	WG21049-023	29-Jul-2021 18:30:40	072921040.d	Client	228	Soil	1	10068	Surrogates	Smp	0.1100		
34	WG21049-024	29-Jul-2021 18:41:15	072921041.d	Client	229	Soil	1	10068	Surrogates	Smp	0.1100		
35	WG21049-025	29-Jul-2021 18:51:52	072921042.d	Client	230	Soil	1	10068	Surrogates	Smp	0.1100		
36	WG21049-026	29-Jul-2021 19:03:05	072921043.d	Client	231	Soil	1	10068	Surrogates	Smp	0.1100		
37	ID CCV 1000B_SVLC-1573	29-Jul-2021 19:13:43	072921044.d	CCV					Analytes	L-5	1.00		
38	CCB 3	29-Jul-2021 19:24:22	072921045.d	InstBlk					Surrogates	Smp	0.1100		
41	WG21049-027	29-Jul-2021 19:56:19	072921048.d	Client	232	Soil	1	10068	Surrogates	Smp	0.1100		
42	WG21049-028	29-Jul-2021 20:06:58	072921049.d	Client	233	Soil	1	10068	Surrogates	Smp	0.1100		
43	WG21049-029	29-Jul-2021 20:17:37	072921050.d	Client	234	Soil	1	10068	Surrogates	Smp	0.1100		

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
47	WQ10188-002	29-Jul-2021 21:00:20	072921054.d	LCS		Aqueous	1	10188	Analytes	100x PDS	0.2000		CONFIRMS, RX AFFECTED SAMPLES
48	ID CCV 1000C_SVLC-1573	29-Jul-2021 21:10:59	072921055.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072921-DOD.b\072921005.d
Injection Date: 29-Jul-2021 12:18:57 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	569537			101.2	50 - 150
8 PFBA			100.00	105.66	105.7	70 - 130
D 50 13C5_PFPeA	523546	517807			98.9	50 - 150
21 PFPeA			100.00	101.99	102	70 - 130
7 PFBS			88.400	95.798	108.4	70 - 130
D 44 13C3_PFBS	169277	171506			101.3	50 - 150
D 63 13C2_4:2 FTS_2	90196	101951			113	50 - 150
1 4:2 FTS			93.400	73.145	78.3	70 - 130
D 49 13C5_PFHxA	600114	590425			98.4	50 - 150
15 PFHxA			100.00	110.80	110.8	70 - 130
22 PFPeS			93.800	95.570	101.9	70 - 130
28 GenX			200.00	181.24	90.6	70 - 130
D 66 13C3_GenX	1000599	1224566			122.4	50 - 150
D 47 13C4_PFHpA	482787	485789			100.6	50 - 150
13 PFHpA			100.00	102.88	102.9	70 - 130
D 45 13C3_PFHxS	137682	153773			111.7	50 - 150
14 PFHxS			91.000	76.499	84.1	70 - 130
29 ADONA			94.200	90.819	96.4	70 - 130
D 64 13C2_6:2 FTS_2	77321	84477			109.3	50 - 150
2 6:2 FTS			94.800	124.51	131.3	70 - 130
20 PFOA			100.00	100.55	100.6	70 - 130
D 53 13C8_PFOA	538966	497010			92.2	50 - 150
12 PFHpS			95.200	100.37	105.4	70 - 130
18 PFOS			92.800	100.29	108.1	70 - 130
D 54 13C8_PFOS	139992	142901			102.1	50 - 150
17 PFNA			100.00	96.249	96.2	70 - 130
D 56 13C9_PFNA	618881	645942			104.4	50 - 150
30 9Cl-PF3ONS			93.200	99.017	106.2	70 - 130
D 55 13C8_PFOSA	250019	334522			133.8	50 - 150
19 PFOSA			100.00	86.378	86.4	70 - 130
16 PFNS			96.000	92.458	96.3	70 - 130
D 65 13C2_8:2 FTS_2	72182	97826			135.5	50 - 150
10 PFDA			100.00	109.97	110	70 - 130
3 8:2 FTS			95.800	92.763	96.8	70 - 130
D 51 13C6_PFDA	590501	635491			107.6	50 - 150
D 58 d3-MeFOSAA	601725	666602			110.8	50 - 150

Report Date: 30-Jul-2021 16:53:31 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\072921-DOD.b\072921005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	84.609	84.6	70 - 130
9 PFDS			96.400	97.473	101.1	70 - 130
D 52 13C7_PFUdA	707587	674596			95.3	50 - 150
25 PFUdA			100.00	98.476	98.5	70 - 130
D 60 d5-EtFOSAA	521292	631810			121.2	50 - 150
5 N-EtFOSAA			100.00	102.08	102.1	70 - 130
D 61 d7-MeFOSE	68295	89844			131.6	50 - 150
32 MeFOSE			100.00	89.251	89.3	70 - 130
D 57 d3-MeFOSA	40777	56630			138.9	50 - 150
26 MeFOSA			100.00	88.465	88.5	70 - 130
31 11Cl-PF3OUDS			94.200	95.924	101.8	70 - 130
D 62 d9-EtFOSE	68452	101779			148.7	50 - 150
33 EtFOSE			100.00	96.530	96.5	70 - 130
D 59 d5-EtFOSA	38025	45916			120.8	50 - 150
27 EtFOSA			100.00	104.65	104.6	70 - 130
11 PFDoA			100.00	107.51	107.5	70 - 130
D 38 13C2_PFDoA	745164	648067			87	50 - 150
4 10:2 FTS			96.400	62.656	65	70 - 130
34 PFDOS			96.800	110.46	114.1	70 - 130
24 PFTrDA			100.00	116.98	117	70 - 130
23 PFTeDA			100.00	105.35	105.3	70 - 130
D 42 13C2_PFTeDA	846373	777635			91.9	50 - 150
D 40 13C2_PFHxDA	768834	893032			116.2	50 - 150
35 PFHxDA			100.00	112.58	112.6	70 - 130
36 PFODA			100.00	101.33	101.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072921-DOD.b\072921006.d
Injection Date: 29-Jul-2021 12:29:34 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	569537	549825			96.5	50 - 150
8 PFBA			200.00	210.19	105.1	70 - 130
D 50 13C5_PFPeA	517807	535344			103.4	50 - 150
21 PFPeA			200.00	196.25	98.1	70 - 130
7 PFBS			176.80	162.10	91.7	70 - 130
D 44 13C3_PFBS	171506	175990			102.6	50 - 150
D 63 13C2_4:2 FTS_2	101951	102464			100.5	50 - 150
1 4:2 FTS			186.80	140.85	75.4	70 - 130
D 49 13C5_PFHxA	590425	598220			101.3	50 - 150
15 PFHxA			200.00	211.39	105.7	70 - 130
22 PFPeS			187.60	190.67	101.6	70 - 130
28 GenX			400.00	401.90	100.5	70 - 130
D 66 13C3_GenX	1224566	1213202			99.1	50 - 150
D 47 13C4_PFHpA	485789	500329			103	50 - 150
13 PFHpA			200.00	209.94	105	70 - 130
D 45 13C3_PFHxS	153773	152596			99.2	50 - 150
14 PFHxS			182.00	187.82	103.2	70 - 130
29 ADONA			188.40	182.93	97.1	70 - 130
D 64 13C2_6:2 FTS_2	84477	84179			99.6	50 - 150
2 6:2 FTS			189.60	234.65	123.8	70 - 130
20 PFOA			200.00	224.03	112	70 - 130
D 53 13C8_PFOA	497010	495586			99.7	50 - 150
12 PFHpS			190.40	209.56	110.1	70 - 130
18 PFOS			185.60	185.23	99.8	70 - 130
D 54 13C8_PFOS	142901	154524			108.1	50 - 150
17 PFNA			200.00	198.99	99.5	70 - 130
D 56 13C9_PFNA	645942	634139			98.2	50 - 150
30 9Cl-PF3ONS			186.40	179.35	96.2	70 - 130
D 55 13C8_PFOSA	334522	312880			93.5	50 - 150
19 PFOSA			200.00	192.74	96.4	70 - 130
16 PFNS			192.00	217.02	113	70 - 130
D 65 13C2_8:2 FTS_2	97826	89286			91.3	50 - 150
10 PFDA			200.00	213.11	106.6	70 - 130
3 8:2 FTS			191.60	164.44	85.8	70 - 130
D 51 13C6_PFDA	635491	590952			93	50 - 150
D 58 d3-MeFOSAA	666602	661851			99.3	50 - 150

Report Date: 30-Jul-2021 16:53:32 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\072921-DOD.b\072921006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	232.36	116.2	70 - 130
9 PFDS			192.80	189.68	98.4	70 - 130
D 52 13C7_PFUdA	674596	604936			89.7	50 - 150
25 PFUdA			200.00	223.86	111.9	70 - 130
D 60 d5-EtFOSAA	631810	651146			103.1	50 - 150
5 N-EtFOSAA			200.00	187.03	93.5	70 - 130
D 61 d7-MeFOSE	89844	90532			100.8	50 - 150
32 MeFOSE			200.00	214.60	107.3	70 - 130
D 57 d3-MeFOSA	56630	50938			89.9	50 - 150
26 MeFOSA			200.00	248.21	124.1	70 - 130
31 11Cl-PF3OUDS			188.40	168.10	89.2	70 - 130
D 62 d9-EtFOSE	101779	99332			97.6	50 - 150
33 EtFOSE			200.00	170.20	85.1	70 - 130
D 59 d5-EtFOSA	45916	44869			97.7	50 - 150
27 EtFOSA			200.00	224.85	112.4	70 - 130
11 PFDoA			200.00	196.24	98.1	70 - 130
D 38 13C2_PFDoA	648067	664150			102.5	50 - 150
4 10:2 FTS			192.80	116.31	60.3	70 - 130
34 PFDOS			193.60	198.08	102.3	70 - 130
24 PFTrDA			200.00	227.00	113.5	70 - 130
23 PFTeDA			200.00	215.32	107.7	70 - 130
D 42 13C2_PFTeDA	777635	780109			100.3	50 - 150
D 40 13C2_PFHxDA	893032	922698			103.3	50 - 150
35 PFHxDA			200.00	209.51	104.8	70 - 130
36 PFODA			200.00	197.58	98.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File:	\\Organics\LL\LCMSMS02.i\072921-DOD.b\072921012.d		
Injection Date:	29-Jul-2021 13:33:11	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	5
Sample Info:	ID CCV 1000A_SVLC-1573	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	569537	576182			101.2	50 - 150
8 PFBA			1000.00	953.35	95.3	70 - 130
D 50 13C5_PFPeA	517807	576433			111.3	50 - 150
21 PFPeA			1000.00	866.50	86.7	70 - 130
7 PFBS			884.00	836.32	94.6	70 - 130
D 44 13C3_PFBS	171506	186583			108.8	50 - 150
D 63 13C2_4:2 FTS_2	101951	89922			88.2	50 - 150
1 4:2 FTS			934.00	1011.95	108.3	70 - 130
D 49 13C5_PFHxA	590425	639174			108.3	50 - 150
15 PFHxA			1000.00	901.67	90.2	70 - 130
22 PFPeS			938.00	915.33	97.6	70 - 130
28 GenX			2000.00	1992.12	99.6	70 - 130
D 66 13C3_GenX	1224566	1101876			90	50 - 150
D 47 13C4_PFHpA	485789	535764			110.3	50 - 150
13 PFHpA			1000.00	859.01	85.9	70 - 130
D 45 13C3_PFHxS	153773	163748			106.5	50 - 150
14 PFHxS			910.00	766.06	84.2	70 - 130
29 ADONA			942.00	832.35	88.4	70 - 130
D 64 13C2_6:2 FTS_2	84477	77344			91.6	50 - 150
2 6:2 FTS			948.00	904.45	95.4	70 - 130
20 PFOA			1000.00	937.71	93.8	70 - 130
D 53 13C8_PFOA	497010	527067			106	50 - 150
12 PFHpS			952.00	838.25	88.1	70 - 130
18 PFOS			928.00	866.32	93.4	70 - 130
D 54 13C8_PFOS	142901	149018			104.3	50 - 150
17 PFNA			1000.00	834.86	83.5	70 - 130
D 56 13C9_PFNA	645942	677564			104.9	50 - 150
30 9Cl-PF3ONS			932.00	875.59	93.9	70 - 130
D 55 13C8_PFOSA	334522	288586			86.3	50 - 150
19 PFOSA			1000.00	1056.76	105.7	70 - 130
16 PFNS			960.00	910.45	94.8	70 - 130
D 65 13C2_8:2 FTS_2	97826	91212			93.2	50 - 150
10 PFDA			1000.00	905.95	90.6	70 - 130
3 8:2 FTS			958.00	834.40	87.1	70 - 130
D 51 13C6_PFDA	635491	666425			104.9	50 - 150
D 58 d3-MeFOSAA	666602	647251			97.1	50 - 150

Report Date: 30-Jul-2021 16:53:40 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\072921-DOD.b\072921012.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	994.35	99.4	70 - 130
9 PFDS			964.00	914.96	94.9	70 - 130
D 52 13C7_PFUdA	674596	676131			100.2	50 - 150
25 PFUdA			1000.00	977.62	97.8	70 - 130
D 60 d5-EtFOSAA	631810	590130			93.4	50 - 150
5 N-EtFOSAA			1000.00	1028.55	102.9	70 - 130
D 61 d7-MeFOSE	89844	92705			103.2	50 - 150
32 MeFOSE			1000.00	932.71	93.3	70 - 130
D 57 d3-MeFOSA	56630	47257			83.4	50 - 150
26 MeFOSA			1000.00	1206.70	120.7	70 - 130
31 11Cl-PF3OUDS			942.00	900.04	95.5	70 - 130
D 62 d9-EtFOSE	101779	97045			95.3	50 - 150
33 EtFOSE			1000.00	962.40	96.2	70 - 130
D 59 d5-EtFOSA	45916	45080			98.2	50 - 150
27 EtFOSA			1000.00	1112.27	111.2	70 - 130
11 PFDoA			1000.00	910.67	91.1	70 - 130
D 38 13C2_PFDoA	648067	692083			106.8	50 - 150
4 10:2 FTS			964.00	630.52	65.4	70 - 130
34 PFDOS			968.00	931.55	96.2	70 - 130
24 PFTrDA			1000.00	1011.83	101.2	70 - 130
23 PFTeDA			1000.00	908.68	90.9	70 - 130
D 42 13C2_PFTeDA	777635	814908			104.8	50 - 150
D 40 13C2_PFHxDA	893032	856149			95.9	50 - 150
35 PFHxDA			1000.00	1053.15	105.3	70 - 130
36 PFODA			1000.00	1023.38	102.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072921-DOD.b\072921032.d
Injection Date: 29-Jul-2021 17:05:41 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 25
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	569537	567778			99.7	50 - 150
8 PFBA			1000.00	887.68	88.8	70 - 130
D 50 13C5_PFPeA	517807	550515			106.3	50 - 150
21 PFPeA			1000.00	885.87	88.6	70 - 130
7 PFBS			884.00	811.69	91.8	70 - 130
D 44 13C3_PFBS	171506	173313			101.1	50 - 150
D 63 13C2_4:2 FTS_2	101951	89169			87.5	50 - 150
1 4:2 FTS			934.00	891.85	95.5	70 - 130
D 49 13C5_PFHxA	590425	636371			107.8	50 - 150
15 PFHxA			1000.00	838.54	83.9	70 - 130
22 PFPeS			938.00	954.22	101.7	70 - 130
28 GenX			2000.00	1993.10	99.7	70 - 130
D 66 13C3_GenX	1224566	1060368			86.6	50 - 150
D 47 13C4_PFHpA	485789	476722			98.1	50 - 150
13 PFHpA			1000.00	951.56	95.2	70 - 130
D 45 13C3_PFHxS	153773	153151			99.6	50 - 150
14 PFHxS			910.00	855.34	94	70 - 130
29 ADONA			942.00	819.08	87	70 - 130
D 64 13C2_6:2 FTS_2	84477	79287			93.9	50 - 150
2 6:2 FTS			948.00	846.49	89.3	70 - 130
20 PFOA			1000.00	927.56	92.8	70 - 130
D 53 13C8_PFOA	497010	493185			99.2	50 - 150
12 PFHpS			952.00	839.00	88.1	70 - 130
18 PFOS			928.00	830.11	89.5	70 - 130
D 54 13C8_PFOS	142901	159830			111.8	50 - 150
17 PFNA			1000.00	898.79	89.9	70 - 130
D 56 13C9_PFNA	645942	646480			100.1	50 - 150
30 9Cl-PF3ONS			932.00	834.33	89.5	70 - 130
D 55 13C8_PFOSA	334522	284515			85.1	50 - 150
19 PFOSA			1000.00	940.91	94.1	70 - 130
16 PFNS			960.00	792.23	82.5	70 - 130
D 65 13C2_8:2 FTS_2	97826	89871			91.9	50 - 150
10 PFDA			1000.00	897.80	89.8	70 - 130
3 8:2 FTS			958.00	870.82	90.9	70 - 130
D 51 13C6_PFDA	635491	600376			94.5	50 - 150
D 58 d3-MeFOSAA	666602	639111			95.9	50 - 150

Report Date: 30-Jul-2021 16:53:59 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\072921-DOD.b\072921032.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1030.28	103	70 - 130
9 PFDS			964.00	829.36	86	70 - 130
D 52 13C7_PFUdA	674596	678602			100.6	50 - 150
25 PFUdA			1000.00	862.32	86.2	70 - 130
D 60 d5-EtFOSAA	631810	581186			92	50 - 150
5 N-EtFOSAA			1000.00	956.53	95.7	70 - 130
D 61 d7-MeFOSE	89844	83224			92.6	50 - 150
32 MeFOSE			1000.00	1049.14	104.9	70 - 130
D 57 d3-MeFOSA	56630	47511			83.9	50 - 150
26 MeFOSA			1000.00	1242.62	124.3	70 - 130
31 11Cl-PF3OUDS			942.00	823.69	87.4	70 - 130
D 62 d9-EtFOSE	101779	91272			89.7	50 - 150
33 EtFOSE			1000.00	952.44	95.2	70 - 130
D 59 d5-EtFOSA	45916	43018			93.7	50 - 150
27 EtFOSA			1000.00	1147.24	114.7	70 - 130
11 PFDoA			1000.00	934.65	93.5	70 - 130
D 38 13C2_PFDoA	648067	632403			97.6	50 - 150
4 10:2 FTS			964.00	577.30	59.9	70 - 130
34 PFDOS			968.00	866.36	89.5	70 - 130
24 PFTrDA			1000.00	1071.23	107.1	70 - 130
23 PFTeDA			1000.00	892.53	89.3	70 - 130
D 42 13C2_PFTeDA	777635	811758			104.4	50 - 150
D 40 13C2_PFHxDA	893032	837847			93.8	50 - 150
35 PFHxDA			1000.00	1041.60	104.2	70 - 130
36 PFODA			1000.00	1026.63	102.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File:	\\Organics\LL\LCMSMS02.i\072921-DOD.b\072921044.d		
Injection Date:	29-Jul-2021 19:13:43	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	37
Sample Info:	ID CCV 1000B_SVLC-1573	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	569537	568675			99.8	50 - 150
8 PFBA			1000.00	914.79	91.5	70 - 130
D 50 13C5_PFPeA	517807	531629			102.7	50 - 150
21 PFPeA			1000.00	928.15	92.8	70 - 130
7 PFBS			884.00	769.85	87.1	70 - 130
D 44 13C3_PFBS	171506	188155			109.7	50 - 150
D 63 13C2_4:2 FTS_2	101951	95869			94	50 - 150
1 4:2 FTS			934.00	884.66	94.7	70 - 130
D 49 13C5_PFHxA	590425	624866			105.8	50 - 150
15 PFHxA			1000.00	868.36	86.8	70 - 130
22 PFPeS			938.00	881.01	93.9	70 - 130
28 GenX			2000.00	2018.90	100.9	70 - 130
D 66 13C3_GenX	1224566	1078948			88.1	50 - 150
D 47 13C4_PFHpA	485789	498122			102.5	50 - 150
13 PFHpA			1000.00	906.23	90.6	70 - 130
D 45 13C3_PFHxS	153773	158729			103.2	50 - 150
14 PFHxS			910.00	746.58	82	70 - 130
29 ADONA			942.00	811.17	86.1	70 - 130
D 64 13C2_6:2 FTS_2	84477	73233			86.7	50 - 150
2 6:2 FTS			948.00	937.23	98.9	70 - 130
20 PFOA			1000.00	1007.37	100.7	70 - 130
D 53 13C8_PFOA	497010	493912			99.4	50 - 150
12 PFHpS			952.00	800.46	84.1	70 - 130
18 PFOS			928.00	868.29	93.6	70 - 130
D 54 13C8_PFOS	142901	154253			107.9	50 - 150
17 PFNA			1000.00	873.91	87.4	70 - 130
D 56 13C9_PFNA	645942	634787			98.3	50 - 150
30 9Cl-PF3ONS			932.00	828.13	88.9	70 - 130
D 55 13C8_PFOSA	334522	283027			84.6	50 - 150
19 PFOSA			1000.00	1009.39	100.9	70 - 130
16 PFNS			960.00	900.66	93.8	70 - 130
D 65 13C2_8:2 FTS_2	97826	83301			85.2	50 - 150
10 PFDA			1000.00	996.28	99.6	70 - 130
3 8:2 FTS			958.00	940.70	98.2	70 - 130
D 51 13C6_PFDA	635491	592729			93.3	50 - 150
D 58 d3-MeFOSAA	666602	627765			94.2	50 - 150

Report Date: 30-Jul-2021 16:54:04 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\072921-DOD.b\072921044.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	996.47	99.6	70 - 130
9 PFDS			964.00	906.42	94	70 - 130
D 52 13C7_PFUdA	674596	648797			96.2	50 - 150
25 PFUdA			1000.00	990.28	99	70 - 130
D 60 d5-EtFOSAA	631810	611979			96.9	50 - 150
5 N-EtFOSAA			1000.00	980.54	98.1	70 - 130
D 61 d7-MeFOSE	89844	83987			93.5	50 - 150
32 MeFOSE			1000.00	1030.96	103.1	70 - 130
D 57 d3-MeFOSA	56630	46115			81.4	50 - 150
26 MeFOSA			1000.00	1137.47	113.7	70 - 130
31 11Cl-PF3OUDS			942.00	856.66	90.9	70 - 130
D 62 d9-EtFOSE	101779	96134			94.5	50 - 150
33 EtFOSE			1000.00	897.01	89.7	70 - 130
D 59 d5-EtFOSA	45916	47325			103.1	50 - 150
27 EtFOSA			1000.00	948.59	94.9	70 - 130
11 PFDoA			1000.00	924.94	92.5	70 - 130
D 38 13C2_PFDoA	648067	631893			97.5	50 - 150
4 10:2 FTS			964.00	609.85	63.3	70 - 130
34 PFDOS			968.00	882.35	91.2	70 - 130
24 PFTrDA			1000.00	1082.23	108.2	70 - 130
23 PFTeDA			1000.00	938.45	93.8	70 - 130
D 42 13C2_PFTeDA	777635	799101			102.8	50 - 150
D 40 13C2_PFHxDA	893032	824952			92.4	50 - 150
35 PFHxDA			1000.00	1058.76	105.9	70 - 130
36 PFODA			1000.00	1026.00	102.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File:	\\Organics\LL\LCMSMS02.i\072921-DOD.b\072921055.d		
Injection Date:	29-Jul-2021 21:10:59	Injection Vol:	10.0 uL
Sample Type:	CCV	Auto Sampler:	48
Sample Info:	ID CCV 1000C_SVLC-1573	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	569537	548030			96.2	50 - 150
8 PFBA			1000.00	939.01	93.9	70 - 130
D 50 13C5_PFPeA	517807	518444			100.1	50 - 150
21 PFPeA			1000.00	864.03	86.4	70 - 130
7 PFBS			884.00	808.00	91.4	70 - 130
D 44 13C3_PFBS	171506	178186			103.9	50 - 150
D 63 13C2_4:2 FTS_2	101951	85867			84.2	50 - 150
1 4:2 FTS			934.00	921.96	98.7	70 - 130
D 49 13C5_PFHxA	590425	610764			103.4	50 - 150
15 PFHxA			1000.00	892.60	89.3	70 - 130
22 PFPeS			938.00	842.10	89.8	70 - 130
28 GenX			2000.00	1937.70	96.9	70 - 130
D 66 13C3_GenX	1224566	1052312			85.9	50 - 150
D 47 13C4_PFHpA	485789	463098			95.3	50 - 150
13 PFHpA			1000.00	984.33	98.4	70 - 130
D 45 13C3_PFHxS	153773	148222			96.4	50 - 150
14 PFHxS			910.00	843.89	92.7	70 - 130
29 ADONA			942.00	868.39	92.2	70 - 130
D 64 13C2_6:2 FTS_2	84477	76137			90.1	50 - 150
2 6:2 FTS			948.00	862.69	91	70 - 130
20 PFOA			1000.00	921.34	92.1	70 - 130
D 53 13C8_PFOA	497010	486002			97.8	50 - 150
12 PFHpS			952.00	911.64	95.8	70 - 130
18 PFOS			928.00	877.85	94.6	70 - 130
D 54 13C8_PFOS	142901	152947			107	50 - 150
17 PFNA			1000.00	843.78	84.4	70 - 130
D 56 13C9_PFNA	645942	627781			97.2	50 - 150
30 9Cl-PF3ONS			932.00	827.78	88.8	70 - 130
D 55 13C8_PFOSA	334522	279542			83.6	50 - 150
19 PFOSA			1000.00	1030.80	103.1	70 - 130
16 PFNS			960.00	796.01	82.9	70 - 130
D 65 13C2_8:2 FTS_2	97826	81838			83.7	50 - 150
10 PFDA			1000.00	934.99	93.5	70 - 130
3 8:2 FTS			958.00	1057.90	110.4	70 - 130
D 51 13C6_PFDA	635491	613820			96.6	50 - 150
D 58 d3-MeFOSAA	666602	636275			95.5	50 - 150

Report Date: 30-Jul-2021 16:53:30 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\072921-DOD.b\072921055.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	992.05	99.2	70 - 130
9 PFDS			964.00	948.67	98.4	70 - 130
D 52 13C7_PFUdA	674596	652158			96.7	50 - 150
25 PFUdA			1000.00	913.24	91.3	70 - 130
D 60 d5-EtFOSAA	631810	563838			89.2	50 - 150
5 N-EtFOSAA			1000.00	923.35	92.3	70 - 130
D 61 d7-MeFOSE	89844	80059			89.1	50 - 150
32 MeFOSE			1000.00	969.70	97	70 - 130
D 57 d3-MeFOSA	56630	46498			82.1	50 - 150
26 MeFOSA			1000.00	1207.61	120.8	70 - 130
31 11Cl-PF3OUDS			942.00	823.36	87.4	70 - 130
D 62 d9-EtFOSE	101779	98707			97	50 - 150
33 EtFOSE			1000.00	908.88	90.9	70 - 130
D 59 d5-EtFOSA	45916	45982			100.1	50 - 150
27 EtFOSA			1000.00	968.04	96.8	70 - 130
11 PFDoA			1000.00	958.08	95.8	70 - 130
D 38 13C2_PFDoA	648067	610362			94.2	50 - 150
4 10:2 FTS			964.00	640.68	66.5	70 - 130
34 PFDOS			968.00	903.99	93.4	70 - 130
24 PFTrDA			1000.00	1028.03	102.8	70 - 130
23 PFTeDA			1000.00	882.40	88.2	70 - 130
D 42 13C2_PFTeDA	777635	797113			102.5	50 - 150
D 40 13C2_PFHxDA	893032	819521			91.8	50 - 150
35 PFHxDA			1000.00	1077.33	107.7	70 - 130
36 PFODA			1000.00	1043.76	104.4	70 - 130

Report Date: 31-Jul-2021 18:43:45 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\073021-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	30-Jul-2021 12:52:43	073021005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 100_SVLC-1547	30-Jul-2021 13:03:16	073021006.d	CCV					Analytes	L-3	1.00		8:2-FTS(140%), EFOSA(134%),ncm/rr affected samples
97	ID IBLK A	30-Jul-2021 13:13:51	073021007.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ10498-001	30-Jul-2021 13:24:34	073021008.d	Client		Soil	1	10498	Surrogates	Smp	0.1100		
2	WQ10498-002	30-Jul-2021 13:35:11	073021009.d	LCS		Soil	1	10498	Analytes	100x PDS	0.1000		
3	WG29008-001	30-Jul-2021 13:45:47	073021010.d	Client	AFFF21-SB29-00-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		rr-1x
4	WG29008-002	30-Jul-2021 13:56:25	073021011.d	Client	AFFF21-SB29-06-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		rr-1x
5	WG29008-003	30-Jul-2021 14:06:59	073021012.d	Client	AFFF21-SB29-12-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		rr-1x
6	WG29008-004	30-Jul-2021 14:17:35	073021013.d	Client	AFFF21-SB29-18-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		rr-1x
7	WG29008-005	30-Jul-2021 14:28:11	073021014.d	Client	AFFF21-SB29-24-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		rr-1x
8	WG29008-006	30-Jul-2021 14:38:51	073021015.d	Client	AFFF21-SB29-27-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		rr-1x
9	WG22019-003	30-Jul-2021 14:49:29	073021016.d	Client	RRAD-FFTA-02-SE-072021	Soil	10	10065	Surrogates	Smp	0.1100		rr-10x (8:2) not reported
10	WG21049-021	30-Jul-2021 15:00:08	073021017.d	Client	226	Soil	5	10068	Surrogates	Smp	0.1100		
11	WG22086-005	30-Jul-2021 15:10:48	073021018.d	Client	DPG-PF-01-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		rr-1x (8:2)
12	WG22086-006	30-Jul-2021 15:21:23	073021019.d	Client	DPG-PF-02-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
13	ID CCV 1000_SVLC-1573	30-Jul-2021 15:31:57	073021020.d	CCV					Analytes	L-5	1.00		
14	CCB 1	30-Jul-2021 15:42:31	073021021.d	InstBlk					Surrogates	Smp	0.1100		
19	WG22086-007	30-Jul-2021 16:35:40	073021026.d	Client	DPG-PF-03-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
20	WG22086-007MS	30-Jul-2021 16:46:19	073021027.d	MS		Soil	1	10344	Analytes	100x PDS	0.1000		
21	WG22086-007MD	30-Jul-2021 16:57:00	073021028.d	MSD		Soil	1	10344	Analytes	100x PDS	0.1000		
22	WG22086-008	30-Jul-2021 17:07:37	073021029.d	Client	DPG-PF-04-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
23	WG22086-009	30-Jul-2021 17:18:13	073021030.d	Client	DPG-PF-05-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
24	WG22086-010	30-Jul-2021 17:28:50	073021031.d	Client	DPG-PF-06-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
25	WG22086-014	30-Jul-2021 17:39:27	073021032.d	Client	DPG-FD-04-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		RR-1X (8:2)
30	ID CCV 1000_SVLC-1573	30-Jul-2021 18:32:44	073021037.d	CCV					Analytes	L-5	1.00		MeFOSA(130.8%), sur:8:2(high),Me and EtFOSAA(high)
31	CCB 2	30-Jul-2021 18:43:26	073021038.d	InstBlk					Surrogates	Smp	0.1100		
32	WG27059-001	30-Jul-2021 18:54:00	073021039.d	Client	Shaw-source-007	Aqueous	1	10346	Surrogates	Smp	0.1100		sur: MeFOSA(low), RX
33	WG27059-002	30-Jul-2021 19:04:34	073021040.d	Client	Shaw-source-007-FRB	Aqueous	1	10346	Surrogates	Smp	0.1100		
34	WG27059-003	30-Jul-2021 19:15:10	073021041.d	Client	Shaw-source-001	Aqueous	1	10346	Surrogates	Smp	0.1100		SUR: MeFOSA(low), RX
35	WG22011-010	30-Jul-2021 19:25:48	073021042.d	Client	AOPC9-W2-13-072021	Aqueous	1	10346	Surrogates	Smp	0.1100		
36	WG22011-011	30-Jul-2021 19:36:28	073021043.d	Client	AOPC21-W6-5-072021	Aqueous	1	10346	Surrogates	Smp	0.1100		
37	WG22011-012	30-Jul-2021 19:47:04	073021044.d	Client	AOPC17,21-WU5-12-072021	Aqueous	1	10346	Surrogates	Smp	0.1100		SUR: 4:2(ND),NCM
38	WG22011-012MS	30-Jul-2021 19:57:47	073021045.d	MS		Aqueous	1	10346	Analytes	100x PDS	0.2000		
39	WG22011-012MD	30-Jul-2021 20:08:23	073021046.d	MSD		Aqueous	1	10346	Analytes	100x PDS	0.2000		
40	WG22011-013	30-Jul-2021 20:19:02	073021047.d	Client	SWB-01-072021	Aqueous	1	10346	Surrogates	Smp	0.1100		
41	WG29003-001	30-Jul-2021 20:29:45	073021048.d	Client	FTKX-FSDB-3-SO-0-2-07272	Soil	1	10498	Surrogates	Smp	0.1100		RR-1X(MeFOSAA,EtFOSAA)
42	WG29003-002	30-Jul-2021 20:40:24	073021049.d	Client	FTKX-FSDB-5-SO-2-3-07272	Soil	1	10498	Surrogates	Smp	0.1100		RR-1X(MeFOSAA,EtFOSAA)
43	WG29003-003	30-Jul-2021 20:51:04	073021050.d	Client	FTKX-FSDB-6-SO-3-3.5-072	Soil	1	10498	Surrogates	Smp	0.1100		
44	ID CCV 1000B_SVLC-1573	30-Jul-2021 21:01:45	073021051.d	CCV					Analytes	L-5	1.00		
45	CCB 3	30-Jul-2021 21:12:23	073021052.d	Client		Aqueous	1		Surrogates	Smp	0.1100		
48	WG29008-001	30-Jul-2021 21:44:23	073021055.d	Client	AFFF21-SB29-00-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
49	WG29008-002	30-Jul-2021 21:55:00	073021056.d	Client	AFFF21-SB29-06-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
50	WG29008-002MS	30-Jul-2021 22:05:38	073021057.d	MS		Soil	1	10498	Analytes	100x PDS	0.1000		
51	WG29008-002MD	30-Jul-2021 22:16:17	073021058.d	MSD		Soil	1	10498	Analytes	100x PDS	0.1000		

Report Date: 31-Jul-2021 18:43:45 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\073021-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
52	WG29008-003	30-Jul-2021 22:26:54	073021059.d	Client	AFFF21-SB29-12-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
53	WG29008-004	30-Jul-2021 22:37:30	073021060.d	Client	AFFF21-SB29-18-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
54	WG29008-005	30-Jul-2021 22:48:06	073021061.d	Client	AFFF21-SB29-24-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
55	WG29008-006	30-Jul-2021 22:58:47	073021062.d	Client	AFFF21-SB29-27-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
56	ID CCV 1000C_SVLC-1573	30-Jul-2021 23:09:32	073021063.d	CCV					Analytes	L-5	1.00		
57	WG29007-001	30-Jul-2021 23:20:13	073021064.d	Client	AFFF21-SB13-00-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		
58	WG29007-002	30-Jul-2021 23:30:51	073021065.d	Client	AFFF21-SB13-06-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		RR-1X
59	WG29007-004	30-Jul-2021 23:41:31	073021066.d	Client	AFFF21-SB13-18-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		RR-1X
60	WG29007-005	30-Jul-2021 23:52:12	073021067.d	Client	AFFF21-SB13-30-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		RR-1X
61	WG29007-006	31-Jul-2021 00:02:51	073021068.d	Client	AFFF21-SB15-00-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		RR-5X
62	WG29007-007	31-Jul-2021 00:13:30	073021069.d	Client	AFFF21-SB15-06-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		RR-1X
63	WG29007-008	31-Jul-2021 00:24:10	073021070.d	Client	AFFF21-SB15-12-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		RR-5X
64	WG29007-009	31-Jul-2021 00:34:52	073021071.d	Client	AFFF21-SB15-30-0728210-0	Soil	50	10498	Surrogates	Smp	0.1100		RR-1X
65	WG29007-011	31-Jul-2021 00:45:32	073021072.d	Client	AFFF21-SB01-00-072821-00	Soil	50	10498	Surrogates	Smp	0.1100		RR-1X
66	WG29007-012	31-Jul-2021 00:56:11	073021073.d	Client	AFFF21-SB01-09-072821-00	Soil	50	10498	Surrogates	Smp	0.1100		RR-1X
67	WG29007-013	31-Jul-2021 01:06:52	073021074.d	Client	AFFF21-SB01-09-072821-01	Soil	50	10498	Surrogates	Smp	0.1100		RR-1X

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073021-DOD.b\073021005.d
Injection Date: 30-Jul-2021 12:52:43 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	559308			99.3	50 - 150
8 PFBA			100.00	109.87	109.9	70 - 130
D 50 13C5_PFPeA	523546	557911			106.6	50 - 150
21 PFPeA			100.00	92.670	92.7	70 - 130
7 PFBS			88.400	91.278	103.3	70 - 130
D 44 13C3_PFBS	169277	188202			111.2	50 - 150
D 63 13C2_4:2 FTS_2	90196	98430			109.1	50 - 150
1 4:2 FTS			93.400	86.599	92.7	70 - 130
D 49 13C5_PFHxA	600114	605602			100.9	50 - 150
15 PFHxA			100.00	99.864	99.9	70 - 130
22 PFPeS			93.800	91.247	97.3	70 - 130
28 GenX			200.00	199.08	99.5	70 - 130
D 66 13C3_GenX	1000599	1219638			121.9	50 - 150
D 47 13C4_PFHpA	482787	495115			102.6	50 - 150
13 PFHpA			100.00	102.14	102.1	70 - 130
D 45 13C3_PFHxS	137682	147970			107.5	50 - 150
14 PFHxS			91.000	94.059	103.4	70 - 130
29 ADONA			94.200	92.621	98.3	70 - 130
D 64 13C2_6:2 FTS_2	77321	88958			115.1	50 - 150
2 6:2 FTS			94.800	148.58	156.7	70 - 130
20 PFOA			100.00	110.88	110.9	70 - 130
D 53 13C8_PFOA	538966	517822			96.1	50 - 150
12 PFHpS			95.200	97.570	102.5	70 - 130
18 PFOS			92.800	84.352	90.9	70 - 130
D 54 13C8_PFOS	139992	153196			109.4	50 - 150
17 PFNA			100.00	96.846	96.8	70 - 130
D 56 13C9_PFNA	618881	668147			108	50 - 150
30 9Cl-PF3ONS			93.200	82.794	88.8	70 - 130
D 55 13C8_PFOSA	250019	327176			130.9	50 - 150
19 PFOSA			100.00	96.972	97	70 - 130
16 PFNS			96.000	93.824	97.7	70 - 130
D 65 13C2_8:2 FTS_2	72182	95440			132.2	50 - 150
10 PFDA			100.00	108.03	108	70 - 130
3 8:2 FTS			95.800	77.274	80.7	70 - 130
D 51 13C6_PFDA	590501	638043			108.1	50 - 150
D 58 d3-MeFOSAA	601725	702193			116.7	50 - 150

NO SAMPLES ASSOCIATED

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	95.804	95.8	70 - 130
9 PFDS			96.400	111.61	115.8	70 - 130
D 52 13C7_PFUdA	707587	596729			84.3	50 - 150
25 PFUdA			100.00	99.671	99.7	70 - 130
D 60 d5-EtFOSAA	521292	634623			121.7	50 - 150
5 N-EtFOSAA			100.00	98.394	98.4	70 - 130
D 61 d7-MeFOSE	68295	89220			130.6	50 - 150
32 MeFOSE			100.00	102.28	102.3	70 - 130
D 57 d3-MeFOSA	40777	46550			114.2	50 - 150
26 MeFOSA			100.00	152.55	152.5	70 - 130
31 11Cl-PF3OUDS			94.200	96.565	102.5	70 - 130
D 62 d9-EtFOSE	68452	105787			154.5	50 - 150
33 EtFOSE			100.00	82.313	82.3	70 - 130
D 59 d5-EtFOSA	38025	52573			138.3	50 - 150
27 EtFOSA			100.00	67.741	67.7	70 - 130
11 PFDoA			100.00	106.90	106.9	70 - 130
D 38 13C2_PFDoA	745164	657796			88.3	50 - 150
4 10:2 FTS			96.400	77.302	80.2	70 - 130
34 PFDOS			96.800	95.505	98.7	70 - 130
24 PFTrDA			100.00	119.50	119.5	70 - 130
23 PFTeDA			100.00	100.03	100	70 - 130
D 42 13C2_PFTeDA	846373	814639			96.3	50 - 150
D 40 13C2_PFHxDA	768834	925351			120.4	50 - 150
35 PFHxDA			100.00	111.90	111.9	70 - 130
36 PFODA			100.00	104.91	104.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073021-DOD.b\073021006.d
Injection Date: 30-Jul-2021 13:03:16 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 100_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	559308	570683			102	50 - 150
8 PFBA			200.00	212.17	106.1	70 - 130
D 50 13C5_PFPeA	557911	518898			93	50 - 150
21 PFPeA			200.00	221.36	110.7	70 - 130
7 PFBS			176.80	179.04	101.3	70 - 130
D 44 13C3_PFBS	188202	176412			93.7	50 - 150
D 63 13C2_4:2 FTS_2	98430	93195			94.7	50 - 150
1 4:2 FTS			186.80	173.66	93	70 - 130
D 49 13C5_PFHxA	605602	644314			106.4	50 - 150
15 PFHxA			200.00	199.14	99.6	70 - 130
22 PFPeS			187.60	183.97	98.1	70 - 130
28 GenX			400.00	419.54	104.9	70 - 130
D 66 13C3_GenX	1219638	1181615			96.9	50 - 150
D 47 13C4_PFHpA	495115	499198			100.8	50 - 150
13 PFHpA			200.00	206.61	103.3	70 - 130
D 45 13C3_PFHxS	147970	156113			105.5	50 - 150
14 PFHxS			182.00	176.27	96.9	70 - 130
29 ADONA			188.40	187.57	99.6	70 - 130
D 64 13C2_6:2 FTS_2	88958	88800			99.8	50 - 150
2 6:2 FTS			189.60	223.71	118	70 - 130
20 PFOA			200.00	198.78	99.4	70 - 130
D 53 13C8_PFOA	517822	506193			97.8	50 - 150
12 PFHpS			190.40	190.79	100.2	70 - 130
18 PFOS			185.60	155.38	83.7	70 - 130
D 54 13C8_PFOS	153196	147668			96.4	50 - 150
17 PFNA			200.00	203.61	101.8	70 - 130
D 56 13C9_PFNA	668147	620473			92.9	50 - 150
30 9Cl-PF3ONS			186.40	191.28	102.6	70 - 130
D 55 13C8_PFOSA	327176	306914			93.8	50 - 150
19 PFOSA			200.00	202.20	101.1	70 - 130
16 PFNS			192.00	216.78	112.9	70 - 130
D 65 13C2_8:2 FTS_2	95440	91350			95.7	50 - 150
10 PFDA			200.00	205.48	102.7	70 - 130
3 8:2 FTS			191.60	269.33	140.6	70 - 130
D 51 13C6_PFDA	638043	638999			100.1	50 - 150
D 58 d3-MeFOSAA	702193	721651			102.8	50 - 150

NO SAMPLES ASSOCIATED

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	194.10	97.1	70 - 130
9 PFDS			192.80	200.53	104	70 - 130
D 52 13C7_PFUdA	596729	672123			112.6	50 - 150
25 PFUdA			200.00	187.22	93.6	70 - 130
D 60 d5-EtFOSAA	634623	662807			104.4	50 - 150
5 N-EtFOSAA			200.00	173.03	86.5	70 - 130
D 61 d7-MeFOSE	89220	85752			96.1	50 - 150
32 MeFOSE			200.00	185.84	92.9	70 - 130
D 57 d3-MeFOSA	46550	50123			107.7	50 - 150
26 MeFOSA			200.00	251.68	125.8	70 - 130
31 11Cl-PF3OUDS			188.40	181.70	96.4	70 - 130
D 62 d9-EtFOSE	105787	99755			94.3	50 - 150
33 EtFOSE			200.00	189.72	94.9	70 - 130
D 59 d5-EtFOSA	52573	43102			82	50 - 150
27 EtFOSA			200.00	266.93	133.5	70 - 130
11 PFDoA			200.00	225.04	112.5	70 - 130
D 38 13C2_PFDoA	657796	609176			92.6	50 - 150
4 10:2 FTS			192.80	135.75	70.4	70 - 130
34 PFDOS			193.60	198.84	102.7	70 - 130
24 PFTrDA			200.00	247.70	123.9	70 - 130
23 PFTeDA			200.00	198.84	99.4	70 - 130
D 42 13C2_PFTeDA	814639	811814			99.7	50 - 150
D 40 13C2_PFHxDA	925351	944690			102.1	50 - 150
35 PFHxDA			200.00	203.06	101.5	70 - 130
36 PFODA			200.00	196.61	98.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073021-DOD.b\073021020.d
Injection Date: 30-Jul-2021 15:31:57 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 13
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	559308	568020			101.6	50 - 150
8 PFBA			1000.00	944.69	94.5	70 - 130
D 50 13C5_PFPeA	557911	553403			99.2	50 - 150
21 PFPeA			1000.00	916.94	91.7	70 - 130
7 PFBS			884.00	794.29	89.9	70 - 130
D 44 13C3_PFBS	188202	193578			102.9	50 - 150
D 63 13C2_4:2 FTS_2	98430	98160			99.7	50 - 150
1 4:2 FTS			934.00	895.84	95.9	70 - 130
D 49 13C5_PFHxA	605602	646858			106.8	50 - 150
15 PFHxA			1000.00	866.53	86.7	70 - 130
22 PFPeS			938.00	854.29	91.1	70 - 130
28 GenX			2000.00	1964.24	98.2	70 - 130
D 66 13C3_GenX	1219638	1108839			90.9	50 - 150
D 47 13C4_PFHpA	495115	502853			101.6	50 - 150
13 PFHpA			1000.00	906.35	90.6	70 - 130
D 45 13C3_PFHxS	147970	161492			109.1	50 - 150
14 PFHxS			910.00	744.52	81.8	70 - 130
29 ADONA			942.00	867.10	92	70 - 130
D 64 13C2_6:2 FTS_2	88958	77295			86.9	50 - 150
2 6:2 FTS			948.00	877.48	92.6	70 - 130
20 PFOA			1000.00	931.59	93.2	70 - 130
D 53 13C8_PFOA	517822	536746			103.7	50 - 150
12 PFHpS			952.00	855.81	89.9	70 - 130
18 PFOS			928.00	811.54	87.5	70 - 130
D 54 13C8_PFOS	153196	160169			104.6	50 - 150
17 PFNA			1000.00	966.91	96.7	70 - 130
D 56 13C9_PFNA	668147	663416			99.3	50 - 150
30 9Cl-PF3ONS			932.00	833.61	89.4	70 - 130
D 55 13C8_PFOSA	327176	307284			93.9	50 - 150
19 PFOSA			1000.00	913.34	91.3	70 - 130
16 PFNS			960.00	842.56	87.8	70 - 130
D 65 13C2_8:2 FTS_2	95440	87644			91.8	50 - 150
10 PFDA			1000.00	935.42	93.5	70 - 130
3 8:2 FTS			958.00	960.43	100.3	70 - 130
D 51 13C6_PFDA	638043	631559			99	50 - 150
D 58 d3-MeFOSAA	702193	638632			90.9	50 - 150

NO SAMPLES ASSOCIATED

Report Date: 31-Jul-2021 18:43:16 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073021-DOD.b\073021020.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1009.47	100.9	70 - 130
9 PFDS			964.00	865.72	89.8	70 - 130
D 52 13C7_PFUdA	596729	658820			110.4	50 - 150
25 PFUdA			1000.00	1034.41	103.4	70 - 130
D 60 d5-EtFOSAA	634623	583656			92	50 - 150
5 N-EtFOSAA			1000.00	998.14	99.8	70 - 130
D 61 d7-MeFOSE	89220	96154			107.8	50 - 150
32 MeFOSE			1000.00	849.08	84.9	70 - 130
D 57 d3-MeFOSA	46550	51023			109.6	50 - 150
26 MeFOSA			1000.00	1205.13	120.5	70 - 130
31 11Cl-PF3OUDS			942.00	829.63	88.1	70 - 130
D 62 d9-EtFOSE	105787	99972			94.5	50 - 150
33 EtFOSE			1000.00	843.79	84.4	70 - 130
D 59 d5-EtFOSA	52573	51382			97.7	50 - 150
27 EtFOSA			1000.00	960.77	96.1	70 - 130
11 PFDoA			1000.00	966.26	96.6	70 - 130
D 38 13C2_PFDoA	657796	655971			99.7	50 - 150
4 10:2 FTS			964.00	615.40	63.8	70 - 130
34 PFDOS			968.00	869.60	89.8	70 - 130
24 PFTrDA			1000.00	1037.52	103.8	70 - 130
23 PFTeDA			1000.00	881.80	88.2	70 - 130
D 42 13C2_PFTeDA	814639	818213			100.4	50 - 150
D 40 13C2_PFHxDA	925351	863479			93.3	50 - 150
35 PFHxDA			1000.00	1020.85	102.1	70 - 130
36 PFODA			1000.00	1047.65	104.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073021-DOD.b\073021037.d
Injection Date: 30-Jul-2021 18:32:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 30
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	559308	589634			105.4	50 - 150
8 PFBA			1000.00	934.79	93.5	70 - 130
D 50 13C5_PFPeA	557911	556261			99.7	50 - 150
21 PFPeA			1000.00	894.53	89.5	70 - 130
7 PFBS			884.00	866.71	98	70 - 130
D 44 13C3_PFBS	188202	184610			98.1	50 - 150
D 63 13C2_4:2 FTS_2	98430	108569			110.3	50 - 150
1 4:2 FTS			934.00	909.07	97.3	70 - 130
D 49 13C5_PFHxA	605602	606375			100.1	50 - 150
15 PFHxA			1000.00	952.05	95.2	70 - 130
22 PFPeS			938.00	884.05	94.2	70 - 130
28 GenX			2000.00	2031.89	101.6	70 - 130
D 66 13C3_GenX	1219638	1042756			85.5	50 - 150
D 47 13C4_PFHpA	495115	550828			111.3	50 - 150
13 PFHpA			1000.00	861.37	86.1	70 - 130
D 45 13C3_PFHxS	147970	155148			104.9	50 - 150
14 PFHxS			910.00	795.40	87.4	70 - 130
29 ADONA			942.00	839.23	89.1	70 - 130
D 64 13C2_6:2 FTS_2	88958	105974			119.1	50 - 150
2 6:2 FTS			948.00	940.18	99.2	70 - 130
20 PFOA			1000.00	938.02	93.8	70 - 130
D 53 13C8_PFOA	517822	524165			101.2	50 - 150
12 PFHpS			952.00	865.70	90.9	70 - 130
18 PFOS			928.00	839.60	90.5	70 - 130
D 54 13C8_PFOS	153196	160519			104.8	50 - 150
17 PFNA			1000.00	956.18	95.6	70 - 130
D 56 13C9_PFNA	668147	705082			105.5	50 - 150
30 9Cl-PF3ONS			932.00	839.21	90	70 - 130
D 55 13C8_PFOSA	327176	332157			101.5	50 - 150
19 PFOSA			1000.00	944.31	94.4	70 - 130
16 PFNS			960.00	880.13	91.7	70 - 130
D 65 13C2_8:2 FTS_2	95440	273941			287	50 - 150
10 PFDA			1000.00	973.17	97.3	70 - 130
3 8:2 FTS			958.00	925.71	96.6	70 - 130
D 51 13C6_PFDA	638043	778869			122.1	50 - 150
D 58 d3-MeFOSAA	702193	1119417			159.4	50 - 150

Report Date: 31-Jul-2021 18:43:21 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073021-DOD.b\073021037.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1025.45	102.5	70 - 130
9 PFDS			964.00	825.96	85.7	70 - 130
D 52 13C7_PFUdA	596729	855141			143.3	50 - 150
25 PFUdA			1000.00	925.12	92.5	70 - 130
D 60 d5-EtFOSAA	634623	1090677			171.9	50 - 150
5 N-EtFOSAA			1000.00	1020.09	102	70 - 130
D 61 d7-MeFOSE	89220	80794			90.6	50 - 150
32 MeFOSE			1000.00	949.94	95	70 - 130
D 57 d3-MeFOSA	46550	44518			95.6	50 - 150
26 MeFOSA			1000.00	1307.90	130.8	70 - 130
31 11Cl-PF3OUDS			942.00	759.81	80.7	70 - 130
D 62 d9-EtFOSE	105787	102896			97.3	50 - 150
33 EtFOSE			1000.00	876.80	87.7	70 - 130
D 59 d5-EtFOSA	52573	44121			83.9	50 - 150
27 EtFOSA			1000.00	1094.23	109.4	70 - 130
11 PFDoA			1000.00	888.80	88.9	70 - 130
D 38 13C2_PFDoA	657796	780399			118.6	50 - 150
4 10:2 FTS			964.00	852.62	88.4	70 - 130
34 PFDOS			968.00	790.00	81.6	70 - 130
24 PFTrDA			1000.00	932.88	93.3	70 - 130
23 PFTeDA			1000.00	879.28	87.9	70 - 130
D 42 13C2_PFTeDA	814639	746451			91.6	50 - 150
D 40 13C2_PFHxDA	925351	479735			51.8	50 - 150
35 PFHxDA			1000.00	1052.06	105.2	70 - 130
36 PFODA			1000.00	871.72	87.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073021-DOD.b\073021051.d
Injection Date: 30-Jul-2021 21:01:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 44
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	559308	587241			105	50 - 150
8 PFBA			1000.00	944.02	94.4	70 - 130
D 50 13C5_PFPeA	557911	587960			105.4	50 - 150
21 PFPeA			1000.00	889.63	89	70 - 130
7 PFBS			884.00	837.14	94.7	70 - 130
D 44 13C3_PFBS	188202	183699			97.6	50 - 150
D 63 13C2_4:2 FTS_2	98430	95898			97.4	50 - 150
1 4:2 FTS			934.00	931.86	99.8	70 - 130
D 49 13C5_PFHxA	605602	666479			110.1	50 - 150
15 PFHxA			1000.00	879.06	87.9	70 - 130
22 PFPeS			938.00	979.77	104.5	70 - 130
28 GenX			2000.00	2061.16	103.1	70 - 130
D 66 13C3_GenX	1219638	1103683			90.5	50 - 150
D 47 13C4_PFHpA	495115	532330			107.5	50 - 150
13 PFHpA			1000.00	953.81	95.4	70 - 130
D 45 13C3_PFHxS	147970	162344			109.7	50 - 150
14 PFHxS			910.00	827.64	90.9	70 - 130
29 ADONA			942.00	831.95	88.3	70 - 130
D 64 13C2_6:2 FTS_2	88958	78916			88.7	50 - 150
2 6:2 FTS			948.00	1075.74	113.5	70 - 130
20 PFOA			1000.00	966.98	96.7	70 - 130
D 53 13C8_PFOA	517822	537488			103.8	50 - 150
12 PFHpS			952.00	864.23	90.8	70 - 130
18 PFOS			928.00	861.03	92.8	70 - 130
D 54 13C8_PFOS	153196	155772			101.7	50 - 150
17 PFNA			1000.00	925.13	92.5	70 - 130
D 56 13C9_PFNA	668147	643443			96.3	50 - 150
30 9Cl-PF3ONS			932.00	893.07	95.8	70 - 130
D 55 13C8_PFOSA	327176	308949			94.4	50 - 150
19 PFOSA			1000.00	935.55	93.6	70 - 130
16 PFNS			960.00	891.35	92.8	70 - 130
D 65 13C2_8:2 FTS_2	95440	99369			104.1	50 - 150
10 PFDA			1000.00	950.81	95.1	70 - 130
3 8:2 FTS			958.00	845.18	88.2	70 - 130
D 51 13C6_PFDA	638043	637674			99.9	50 - 150
D 58 d3-MeFOSAA	702193	710056			101.1	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1005.90	100.6	70 - 130
9 PFDS			964.00	880.57	91.3	70 - 130
D 52 13C7_PFUdA	596729	624047			104.6	50 - 150
25 PFUdA			1000.00	1053.53	105.4	70 - 130
D 60 d5-EtFOSAA	634623	638271			100.6	50 - 150
5 N-EtFOSAA			1000.00	915.43	91.5	70 - 130
D 61 d7-MeFOSE	89220	87990			98.6	50 - 150
32 MeFOSE			1000.00	962.04	96.2	70 - 130
D 57 d3-MeFOSA	46550	60192			129.3	50 - 150
26 MeFOSA			1000.00	1054.03	105.4	70 - 130
31 11Cl-PF3OUDS			942.00	863.12	91.6	70 - 130
D 62 d9-EtFOSE	105787	91444			86.4	50 - 150
33 EtFOSE			1000.00	981.47	98.1	70 - 130
D 59 d5-EtFOSA	52573	48384			92	50 - 150
27 EtFOSA			1000.00	1104.42	110.4	70 - 130
11 PFDoA			1000.00	937.73	93.8	70 - 130
D 38 13C2_PFDoA	657796	681968			103.7	50 - 150
4 10:2 FTS			964.00	529.21	54.9	70 - 130
34 PFDOS			968.00	939.17	97	70 - 130
24 PFTrDA			1000.00	1086.58	108.7	70 - 130
23 PFTeDA			1000.00	923.03	92.3	70 - 130
D 42 13C2_PFTeDA	814639	861576			105.8	50 - 150
D 40 13C2_PFHxDA	925351	874889			94.5	50 - 150
35 PFHxDA			1000.00	1063.57	106.4	70 - 130
36 PFODA			1000.00	1043.98	104.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073021-DOD.b\073021063.d
Injection Date: 30-Jul-2021 23:09:32 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 56
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	559308	610014			109.1	50 - 150
8 PFBA			1000.00	943.48	94.3	70 - 130
D 50 13C5_PFPeA	557911	593288			106.3	50 - 150
21 PFPeA			1000.00	954.12	95.4	70 - 130
7 PFBS			884.00	770.26	87.1	70 - 130
D 44 13C3_PFBS	188202	206605			109.8	50 - 150
D 63 13C2_4:2 FTS_2	98430	100174			101.8	50 - 150
1 4:2 FTS			934.00	919.60	98.5	70 - 130
D 49 13C5_PFHxA	605602	691998			114.3	50 - 150
15 PFHxA			1000.00	852.44	85.2	70 - 130
22 PFPeS			938.00	885.81	94.4	70 - 130
28 GenX			2000.00	1999.52	100	70 - 130
D 66 13C3_GenX	1219638	1195037			98	50 - 150
D 47 13C4_PFHpA	495115	575264			116.2	50 - 150
13 PFHpA			1000.00	860.70	86.1	70 - 130
D 45 13C3_PFHxS	147970	171908			116.2	50 - 150
14 PFHxS			910.00	852.49	93.7	70 - 130
29 ADONA			942.00	870.83	92.4	70 - 130
D 64 13C2_6:2 FTS_2	88958	88284			99.2	50 - 150
2 6:2 FTS			948.00	1029.74	108.6	70 - 130
20 PFOA			1000.00	946.41	94.6	70 - 130
D 53 13C8_PFOA	517822	565379			109.2	50 - 150
12 PFHpS			952.00	914.67	96.1	70 - 130
18 PFOS			928.00	807.41	87	70 - 130
D 54 13C8_PFOS	153196	171592			112	50 - 150
17 PFNA			1000.00	885.68	88.6	70 - 130
D 56 13C9_PFNA	668147	709820			106.2	50 - 150
30 9Cl-PF3ONS			932.00	838.64	90	70 - 130
D 55 13C8_PFOSA	327176	324272			99.1	50 - 150
19 PFOSA			1000.00	981.15	98.1	70 - 130
16 PFNS			960.00	873.76	91	70 - 130
D 65 13C2_8:2 FTS_2	95440	86129			90.2	50 - 150
10 PFDA			1000.00	883.00	88.3	70 - 130
3 8:2 FTS			958.00	1027.45	107.2	70 - 130
D 51 13C6_PFDA	638043	672230			105.4	50 - 150
D 58 d3-MeFOSAA	702193	680006			96.8	50 - 150

NO SAMPLES ASSOCIATED

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1108.82	110.9	70 - 130
9 PFDS			964.00	853.54	88.5	70 - 130
D 52 13C7_PFUdA	596729	668213			112	50 - 150
25 PFUdA			1000.00	907.94	90.8	70 - 130
D 60 d5-EtFOSAA	634623	649118			102.3	50 - 150
5 N-EtFOSAA			1000.00	995.28	99.5	70 - 130
D 61 d7-MeFOSE	89220	95439			107	50 - 150
32 MeFOSE			1000.00	1025.31	102.5	70 - 130
D 57 d3-MeFOSA	46550	56422			121.2	50 - 150
26 MeFOSA			1000.00	1118.18	111.8	70 - 130
31 11Cl-PF3OUDS			942.00	839.31	89.1	70 - 130
D 62 d9-EtFOSE	105787	101969			96.4	50 - 150
33 EtFOSE			1000.00	973.05	97.3	70 - 130
D 59 d5-EtFOSA	52573	47103			89.6	50 - 150
27 EtFOSA			1000.00	1185.04	118.5	70 - 130
11 PFDoA			1000.00	949.14	94.9	70 - 130
D 38 13C2_PFDoA	657796	680742			103.5	50 - 150
4 10:2 FTS			964.00	607.52	63	70 - 130
34 PFDOS			968.00	893.65	92.3	70 - 130
24 PFTrDA			1000.00	1127.25	112.7	70 - 130
23 PFTeDA			1000.00	935.63	93.6	70 - 130
D 42 13C2_PFTeDA	814639	887601			109	50 - 150
D 40 13C2_PFHxDA	925351	888010			96	50 - 150
35 PFHxDA			1000.00	1081.82	108.2	70 - 130
36 PFODA			1000.00	1056.22	105.6	70 - 130

Report Date: 03-Aug-2021 19:54:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

NO SAMPLES ASSOCIATED

Batch: \\Organics\LL\LCMSMS02.i\073121-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	31-Jul-2021 12:43:44	073121005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	31-Jul-2021 12:54:21	073121006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	31-Jul-2021 13:04:55	073121007.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ10645-001	31-Jul-2021 13:15:31	073121008.d	MBlk		Soil	1	10645	Surrogates	Smp	0.1100		
2	WQ10645-002	31-Jul-2021 13:26:10	073121009.d	LCS		Soil	1	10645	Analytes	100x PDS	0.1000		
3	WQ10559-001	31-Jul-2021 13:36:46	073121010.d	MBlk		Aqueous	1	10559	Surrogates	Smp	0.1100		MB contaminated with 6:2-FTS
4	WQ10559-002	31-Jul-2021 13:47:25	073121011.d	LCS		Aqueous	1	10559	Analytes	100x PDS	0.2000		6:2(567.9%),rx/ncm affected samples
5	WG30006-001	31-Jul-2021 13:58:05	073121012.d	Client	AFFF21-SB03-00-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
6	WG30006-002	31-Jul-2021 14:08:44	073121013.d	Client	AFFF21-SB03-06-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
7	WG30006-003	31-Jul-2021 14:19:22	073121014.d	Client	AFFF21-SB03-06-072921-01	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
8	WG30006-004	31-Jul-2021 14:30:04	073121015.d	Client	AFFF21-SB03-12-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
9	WG30006-005	31-Jul-2021 14:40:42	073121016.d	Client	AFFF21-SB03-18-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
10	WG30006-006	31-Jul-2021 14:51:21	073121017.d	Client	AFFF21-SB03-24-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
11	WG30006-007	31-Jul-2021 15:02:02	073121018.d	Client	AFFF21-SB03-28-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
12	WG30006-008	31-Jul-2021 15:12:35	073121019.d	Client	AFFF21-GW03-23-072921-00	Aqueous	50	10648	Surrogates	Smp	0.1100		RR-1X
13	WG30006-009	31-Jul-2021 15:23:09	073121020.d	Client	AFFF21-GW03-15-072921-00	Aqueous	50	10648	Surrogates	Smp	0.1100		RR-10X
14	WG29007-003	31-Jul-2021 15:33:43	073121021.d	Client	AFFF21-SB13-12-0728210-0	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
15	ID CCV 1000_SVLC-1573	31-Jul-2021 15:44:21	073121022.d	CCV					Analytes	L-5	1.00		
16	CCB 1	31-Jul-2021 15:55:04	073121023.d	InstBlk					Surrogates	Smp	0.1100		
17	WQ10561-001	31-Jul-2021 16:05:40	073121024.d	MBlk		Soil	1	10561	Surrogates	Smp	0.1100		
18	WQ10561-002	31-Jul-2021 16:16:20	073121025.d	LCS		Soil	1	10561	Analytes	100x PDS	0.1000		
19	WQ10648-001	31-Jul-2021 16:26:57	073121026.d	MBlk		Aqueous	1	10648	Surrogates	Smp	0.1100		6:2-FTS (119.39ng/L), NCM/RX affected samples
20	WQ10648-002	31-Jul-2021 16:37:38	073121027.d	LCS		Aqueous	1	10648	Analytes	100x PDS	0.2000		6:2(148.5%),RX/NCM affected samples
21	WG29007-001	31-Jul-2021 16:48:21	073121028.d	Client	AFFF21-SB13-00-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
22	WG29007-002	31-Jul-2021 16:58:59	073121029.d	Client	AFFF21-SB13-06-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
23	WG29007-004	31-Jul-2021 17:09:34	073121030.d	Client	AFFF21-SB13-18-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
24	WG29007-005	31-Jul-2021 17:20:14	073121031.d	Client	AFFF21-SB13-30-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
25	WG29007-007	31-Jul-2021 17:30:51	073121032.d	Client	AFFF21-SB15-06-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
26	WG29007-009	31-Jul-2021 17:41:26	073121033.d	Client	AFFF21-SB15-30-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
27	WG29007-011	31-Jul-2021 17:52:04	073121034.d	Client	AFFF21-SB01-00-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		RX, SUR: MeFOSAA(LOW),EtFOSAA(LOW)
28	WG29007-012	31-Jul-2021 18:02:47	073121035.d	Client	AFFF21-SB01-09-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		
29	WG29007-013	31-Jul-2021 18:13:24	073121036.d	Client	AFFF21-SB01-09-072821-01	Soil	1	10498	Surrogates	Smp	0.1100		
30	WG22019-003	31-Jul-2021 18:24:03	073121037.d	Client	RRAD-FFTA-02-SE-072021	Soil	10	10065	Surrogates	Smp	0.1100		
31	ID CCV 1000A_SVLC-1573	31-Jul-2021 18:34:45	073121038.d	CCV					Analytes	L-5	1.00		
32	CCB 2	31-Jul-2021 18:45:20	073121039.d	InstBlk					Surrogates	Smp	0.1100		
33	WQ10417-001	31-Jul-2021 18:55:55	073121040.d	MBlk		Aqueous	1	10417	Surrogates	Smp	0.1100		
34	WQ10417-002	31-Jul-2021 19:06:31	073121041.d	LCS		Aqueous	1	10417	Analytes	100x PDS	0.2000		
35	WG22086-005	31-Jul-2021 19:17:10	073121042.d	Client	DPG-PF-01-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
36	WG22086-014	31-Jul-2021 19:27:49	073121043.d	Client	DPG-FD-04-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
37	WG29007-006	31-Jul-2021 19:38:25	073121044.d	Client	AFFF21-SB15-00-0728210-0	Soil	5	10498	Surrogates	Smp	0.1100		
38	WG29007-008	31-Jul-2021 19:49:05	073121045.d	Client	AFFF21-SB15-12-0728210-0	Soil	5	10498	Surrogates	Smp	0.1100		
39	WG24009-001	31-Jul-2021 19:59:43	073121046.d	Client	AOPC22-10J02A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		
40	WG24009-002	31-Jul-2021 20:10:23	073121047.d	Client	AOPC22-10J02A-072221-FD	Aqueous	1	10417	Surrogates	Smp	0.1100		
41	WG24009-003	31-Jul-2021 20:21:03	073121048.d	Client	AOPC5-14D28A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-20X

Report Date: 03-Aug-2021 19:54:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\073121-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
42	WG24009-004	31-Jul-2021 20:31:40	073121049.d	Client	AOPC5-14D36A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-100X, SUR: PFOS(low),PFNA(low)
43	WG24009-005	31-Jul-2021 20:42:20	073121050.d	Client	AOPC22-10J01A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X
44	WG24009-006	31-Jul-2021 20:53:01	073121051.d	Client	AOPC6-14D02A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-100X
45	ID CCV 1000B_SVLC-1573	31-Jul-2021 21:03:38	073121052.d	CCV					Analytes	L-5	1.00		
46	CCB 3	31-Jul-2021 21:14:16	073121053.d	InstBlk					Surrogates	Smp	0.1100		
47	WG30006-001	31-Jul-2021 21:24:57	073121054.d	Client	AFFF21-SB03-00-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
48	WG30006-002	31-Jul-2021 21:35:37	073121055.d	Client	AFFF21-SB03-06-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
49	WG30006-003	31-Jul-2021 21:46:15	073121056.d	Client	AFFF21-SB03-06-072921-01	Soil	1	10645	Surrogates	Smp	0.1100		
50	WG30006-004	31-Jul-2021 21:56:55	073121057.d	Client	AFFF21-SB03-12-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
51	WG30006-005	31-Jul-2021 22:07:35	073121058.d	Client	AFFF21-SB03-18-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
52	WG30006-006	31-Jul-2021 22:18:09	073121059.d	Client	AFFF21-SB03-24-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
53	WG30006-007	31-Jul-2021 22:28:44	073121060.d	Client	AFFF21-SB03-28-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
54	WG30006-008	31-Jul-2021 22:39:20	073121061.d	Client	AFFF21-GW03-23-072921-00	Aqueous	1	10648	Surrogates	Smp	0.1100		SUR: MFOSA(low),TeDA(low),CENTRIFUGED,NCM
55	WG30006-009	31-Jul-2021 22:49:59	073121062.d	Client	AFFF21-GW03-15-072921-00	Aqueous	1	10648	Surrogates	Smp	0.1100		mis-prep, rr-10X
56	WG29007-003	31-Jul-2021 23:00:44	073121063.d	Client	AFFF21-SB13-12-0728210-0	Soil	1	10645	Surrogates	Smp	0.1100		reanalyzed with MS/MSD, not reported
57	ID CCV 1000C_SVLC-1573	31-Jul-2021 23:11:23	073121064.d	CCV					Analytes	L-5	1.00		
58	CCB 4	31-Jul-2021 23:22:02	073121065.d	InstBlk					Surrogates	Smp	0.1100		
59	WG29009-004	31-Jul-2021 23:32:42	073121066.d	Client	AFFF01-FRB-072821-01-T2	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS contamination, rx
60	WG29009-008	31-Jul-2021 23:43:21	073121067.d	Client	AFFF01-FRB-072821-01-T1	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
61	WG29009-009	31-Jul-2021 23:54:01	073121068.d	Client	AFFF01-RB-072821-01-T1	Aqueous	1	10648	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
62	WG29007-010	01-Aug-2021 00:04:43	073121069.d	Client	AFFF21-FRB-01-072821-03-	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
63	WG29007-018	01-Aug-2021 00:15:21	073121070.d	Client	AFFF21-FRB-02-072821-T4	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
64	WG29007-019	01-Aug-2021 00:26:04	073121071.d	Client	AFFF21-RB-01-072821-T4	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
65	ID CCV 1000D_SVLC-1573	01-Aug-2021 00:36:49	073121072.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121005.d
Injection Date: 31-Jul-2021 12:43:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	630797			112	50 - 150
8 PFBA			100.00	105.43	105.4	70 - 130
D 50 13C5_PFPeA	523546	580611			110.9	50 - 150
21 PFPeA			100.00	101.93	101.9	70 - 130
7 PFBS			88.400	93.544	105.8	70 - 130
D 44 13C3_PFBS	169277	180931			106.9	50 - 150
D 63 13C2_4:2 FTS_2	90196	109162			121	50 - 150
1 4:2 FTS			93.400	100.26	107.3	70 - 130
D 49 13C5_PFHxA	600114	669846			111.6	50 - 150
15 PFHxA			100.00	96.354	96.4	70 - 130
22 PFPeS			93.800	90.054	96	70 - 130
28 GenX			200.00	203.51	101.8	70 - 130
D 66 13C3_GenX	1000599	1263013			126.2	50 - 150
D 47 13C4_PFHpA	482787	541026			112.1	50 - 150
13 PFHpA			100.00	87.538	87.5	70 - 130
D 45 13C3_PFHxS	137682	147645			107.2	50 - 150
14 PFHxS			91.000	89.117	97.9	70 - 130
29 ADONA			94.200	101.70	108	70 - 130
D 64 13C2_6:2 FTS_2	77321	93519			120.9	50 - 150
2 6:2 FTS			94.800	149.89	158.1	70 - 130
20 PFOA			100.00	105.94	105.9	70 - 130
D 53 13C8_PFOA	538966	508929			94.4	50 - 150
12 PFHpS			95.200	93.607	98.3	70 - 130
18 PFOS			92.800	87.659	94.5	70 - 130
D 54 13C8_PFOS	139992	147774			105.6	50 - 150
17 PFNA			100.00	112.18	112.2	70 - 130
D 56 13C9_PFNA	618881	632796			102.2	50 - 150
30 9Cl-PF3ONS			93.200	98.786	106	70 - 130
D 55 13C8_PFOSA	250019	286703			114.7	50 - 150
19 PFOSA			100.00	97.563	97.6	70 - 130
16 PFNS			96.000	105.17	109.5	70 - 130
D 65 13C2_8:2 FTS_2	72182	108532			150.4	50 - 150
10 PFDA			100.00	105.97	106	70 - 130
3 8:2 FTS			95.800	92.775	96.8	70 - 130
D 51 13C6_PFDA	590501	617850			104.6	50 - 150
D 58 d3-MeFOSAA	601725	638732			106.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	85.626	85.6	70 - 130
9 PFDS			96.400	86.604	89.8	70 - 130
D 52 13C7_PFUdA	707587	671685			94.9	50 - 150
25 PFUdA			100.00	110.97	111	70 - 130
D 60 d5-EtFOSAA	521292	592168			113.6	50 - 150
5 N-EtFOSAA			100.00	76.888	76.9	70 - 130
D 61 d7-MeFOSE	68295	90941			133.2	50 - 150
32 MeFOSE			100.00	98.929	98.9	70 - 130
D 57 d3-MeFOSA	40777	54238			133	50 - 150
26 MeFOSA			100.00	97.800	97.8	70 - 130
31 11Cl-PF3OUDS			94.200	91.365	97	70 - 130
D 62 d9-EtFOSE	68452	95057			138.9	50 - 150
33 EtFOSE			100.00	105.77	105.8	70 - 130
D 59 d5-EtFOSA	38025	51944			136.6	50 - 150
27 EtFOSA			100.00	75.489	75.5	70 - 130
11 PFDoA			100.00	106.68	106.7	70 - 130
D 38 13C2_PFDoA	745164	650962			87.4	50 - 150
4 10:2 FTS			96.400	53.883	55.9	70 - 130
34 PFDOS			96.800	96.142	99.3	70 - 130
24 PFTrDA			100.00	109.95	109.9	70 - 130
23 PFTeDA			100.00	102.52	102.5	70 - 130
D 42 13C2_PFTeDA	846373	953398			112.6	50 - 150
D 40 13C2_PFHxDA	768834	904421			117.6	50 - 150
35 PFHxDA			100.00	121.31	121.3	70 - 130
36 PFODA			100.00	107.65	107.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121006.d
Injection Date: 31-Jul-2021 12:54:21 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	619099			98.1	50 - 150
8 PFBA			200.00	205.22	102.6	70 - 130
D 50 13C5_PFPeA	580611	618368			106.5	50 - 150
21 PFPeA			200.00	200.63	100.3	70 - 130
7 PFBS			176.80	185.02	104.7	70 - 130
D 44 13C3_PFBS	180931	183664			101.5	50 - 150
D 63 13C2_4:2 FTS_2	109162	113013			103.5	50 - 150
1 4:2 FTS			186.80	205.73	110.1	70 - 130
D 49 13C5_PFHxA	669846	637596			95.2	50 - 150
15 PFHxA			200.00	213.37	106.7	70 - 130
22 PFPeS			187.60	173.52	92.5	70 - 130
28 GenX			400.00	400.98	100.2	70 - 130
D 66 13C3_GenX	1263013	1201115			95.1	50 - 150
D 47 13C4_PFHpA	541026	551602			102	50 - 150
13 PFHpA			200.00	200.43	100.2	70 - 130
D 45 13C3_PFHxS	147645	151769			102.8	50 - 150
14 PFHxS			182.00	187.67	103.1	70 - 130
29 ADONA			188.40	192.00	101.9	70 - 130
D 64 13C2_6:2 FTS_2	93519	94950			101.5	50 - 150
2 6:2 FTS			189.60	204.83	108	70 - 130
20 PFOA			200.00	220.04	110	70 - 130
D 53 13C8_PFOA	508929	518622			101.9	50 - 150
12 PFHpS			190.40	184.80	97.1	70 - 130
18 PFOS			185.60	190.07	102.4	70 - 130
D 54 13C8_PFOS	147774	148532			100.5	50 - 150
17 PFNA			200.00	202.95	101.5	70 - 130
D 56 13C9_PFNA	632796	685491			108.3	50 - 150
30 9Cl-PF3ONS			186.40	172.17	92.4	70 - 130
D 55 13C8_PFOSA	286703	311015			108.5	50 - 150
19 PFOSA			200.00	188.73	94.4	70 - 130
16 PFNS			192.00	228.92	119.2	70 - 130
D 65 13C2_8:2 FTS_2	108532	106801			98.4	50 - 150
10 PFDA			200.00	204.16	102.1	70 - 130
3 8:2 FTS			191.60	168.90	88.1	70 - 130
D 51 13C6_PFDA	617850	613585			99.3	50 - 150
D 58 d3-MeFOSAA	638732	634434			99.3	50 - 150

Report Date: 03-Aug-2021 19:53:31 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	216.47	108.2	70 - 130
9 PFDS			192.80	193.32	100.3	70 - 130
D 52 13C7_PFUdA	671685	676160			100.7	50 - 150
25 PFUdA			200.00	217.55	108.8	70 - 130
D 60 d5-EtFOSAA	592168	647982			109.4	50 - 150
5 N-EtFOSAA			200.00	165.56	82.8	70 - 130
D 61 d7-MeFOSE	90941	85494			94	50 - 150
32 MeFOSE			200.00	202.87	101.4	70 - 130
D 57 d3-MeFOSA	54238	49825			91.9	50 - 150
26 MeFOSA			200.00	261.95	131	70 - 130
31 11Cl-PF3OUDS			188.40	186.11	98.8	70 - 130
D 62 d9-EtFOSE	95057	98725			103.9	50 - 150
33 EtFOSE			200.00	171.63	85.8	70 - 130
D 59 d5-EtFOSA	51944	48708			93.8	50 - 150
27 EtFOSA			200.00	210.35	105.2	70 - 130
11 PFDoA			200.00	195.63	97.8	70 - 130
D 38 13C2_PFDoA	650962	701514			107.8	50 - 150
4 10:2 FTS			192.80	110.61	57.4	70 - 130
34 PFDOS			193.60	201.90	104.3	70 - 130
24 PFTrDA			200.00	212.32	106.2	70 - 130
23 PFTeDA			200.00	200.05	100	70 - 130
D 42 13C2_PFTeDA	953398	949684			99.6	50 - 150
D 40 13C2_PFHxDA	904421	927933			102.6	50 - 150
35 PFHxDA			200.00	214.64	107.3	70 - 130
36 PFODA			200.00	207.85	103.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121022.d
Injection Date: 31-Jul-2021 15:44:21 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 15
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	630973			100	50 - 150
8 PFBA			1000.00	936.95	93.7	70 - 130
D 50 13C5_PFPeA	580611	592809			102.1	50 - 150
21 PFPeA			1000.00	916.31	91.6	70 - 130
7 PFBS			884.00	816.31	92.3	70 - 130
D 44 13C3_PFBS	180931	175276			96.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	100278			91.9	50 - 150
1 4:2 FTS			934.00	937.36	100.4	70 - 130
D 49 13C5_PFHxA	669846	649347			96.9	50 - 150
15 PFHxA			1000.00	919.28	91.9	70 - 130
22 PFPeS			938.00	888.80	94.8	70 - 130
28 GenX			2000.00	2016.60	100.8	70 - 130
D 66 13C3_GenX	1263013	1083830			85.8	50 - 150
D 47 13C4_PFHpA	541026	572100			105.7	50 - 150
13 PFHpA			1000.00	872.65	87.3	70 - 130
D 45 13C3_PFHxS	147645	150185			101.7	50 - 150
14 PFHxS			910.00	885.58	97.3	70 - 130
29 ADONA			942.00	906.93	96.3	70 - 130
D 64 13C2_6:2 FTS_2	93519	88211			94.3	50 - 150
2 6:2 FTS			948.00	964.75	101.8	70 - 130
20 PFOA			1000.00	953.99	95.4	70 - 130
D 53 13C8_PFOA	508929	520145			102.2	50 - 150
12 PFHpS			952.00	856.88	90	70 - 130
18 PFOS			928.00	805.03	86.7	70 - 130
D 54 13C8_PFOS	147774	162770			110.1	50 - 150
17 PFNA			1000.00	888.34	88.8	70 - 130
D 56 13C9_PFNA	632796	671445			106.1	50 - 150
30 9Cl-PF3ONS			932.00	784.93	84.2	70 - 130
D 55 13C8_PFOSA	286703	282327			98.5	50 - 150
19 PFOSA			1000.00	988.67	98.9	70 - 130
16 PFNS			960.00	830.65	86.5	70 - 130
D 65 13C2_8:2 FTS_2	108532	100566			92.7	50 - 150
10 PFDA			1000.00	972.27	97.2	70 - 130
3 8:2 FTS			958.00	923.73	96.4	70 - 130
D 51 13C6_PFDA	617850	591496			95.7	50 - 150
D 58 d3-MeFOSAA	638732	594065			93	50 - 150

Report Date: 03-Aug-2021 19:53:39 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121022.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1031.61	103.2	70 - 130
9 PFDS			964.00	832.38	86.3	70 - 130
D 52 13C7_PFUdA	671685	650908			96.9	50 - 150
25 PFUdA			1000.00	935.26	93.5	70 - 130
D 60 d5-EtFOSAA	592168	571978			96.6	50 - 150
5 N-EtFOSAA			1000.00	910.60	91.1	70 - 130
D 61 d7-MeFOSE	90941	87272			96	50 - 150
32 MeFOSE			1000.00	913.52	91.4	70 - 130
D 57 d3-MeFOSA	54238	46582			85.9	50 - 150
26 MeFOSA			1000.00	1247.55	124.8	70 - 130
31 11Cl-PF3OUDS			942.00	776.58	82.4	70 - 130
D 62 d9-EtFOSE	95057	96999			102	50 - 150
33 EtFOSE			1000.00	888.15	88.8	70 - 130
D 59 d5-EtFOSA	51944	45661			87.9	50 - 150
27 EtFOSA			1000.00	1028.63	102.9	70 - 130
11 PFDoA			1000.00	939.83	94	70 - 130
D 38 13C2_PFDoA	650962	656771			100.9	50 - 150
4 10:2 FTS			964.00	620.37	64.4	70 - 130
34 PFDOS			968.00	858.94	88.7	70 - 130
24 PFTrDA			1000.00	1081.08	108.1	70 - 130
23 PFTeDA			1000.00	954.48	95.4	70 - 130
D 42 13C2_PFTeDA	953398	963862			101.1	50 - 150
D 40 13C2_PFHxDA	904421	840486			92.9	50 - 150
35 PFHxDA			1000.00	1061.54	106.2	70 - 130
36 PFODA			1000.00	1031.99	103.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121038.d
Injection Date: 31-Jul-2021 18:34:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	661563			104.9	50 - 150
8 PFBA			1000.00	912.07	91.2	70 - 130
D 50 13C5_PFPeA	580611	625866			107.8	50 - 150
21 PFPeA			1000.00	882.34	88.2	70 - 130
7 PFBS			884.00	837.32	94.7	70 - 130
D 44 13C3_PFBS	180931	186339			103	50 - 150
D 63 13C2_4:2 FTS_2	109162	102087			93.5	50 - 150
1 4:2 FTS			934.00	983.44	105.3	70 - 130
D 49 13C5_PFHxA	669846	710604			106.1	50 - 150
15 PFHxA			1000.00	860.82	86.1	70 - 130
22 PFPeS			938.00	900.57	96	70 - 130
28 GenX			2000.00	1996.46	99.8	70 - 130
D 66 13C3_GenX	1263013	1108881			87.8	50 - 150
D 47 13C4_PFHpA	541026	562782			104	50 - 150
13 PFHpA			1000.00	922.12	92.2	70 - 130
D 45 13C3_PFHxS	147645	161712			109.5	50 - 150
14 PFHxS			910.00	819.06	90	70 - 130
29 ADONA			942.00	886.02	94.1	70 - 130
D 64 13C2_6:2 FTS_2	93519	84286			90.1	50 - 150
2 6:2 FTS			948.00	1013.53	106.9	70 - 130
20 PFOA			1000.00	927.95	92.8	70 - 130
D 53 13C8_PFOA	508929	546469			107.4	50 - 150
12 PFHpS			952.00	880.02	92.4	70 - 130
18 PFOS			928.00	867.63	93.5	70 - 130
D 54 13C8_PFOS	147774	157144			106.3	50 - 150
17 PFNA			1000.00	921.91	92.2	70 - 130
D 56 13C9_PFNA	632796	688784			108.8	50 - 150
30 9Cl-PF3ONS			932.00	908.05	97.4	70 - 130
D 55 13C8_PFOSA	286703	286613			100	50 - 150
19 PFOSA			1000.00	1008.82	100.9	70 - 130
16 PFNS			960.00	874.86	91.1	70 - 130
D 65 13C2_8:2 FTS_2	108532	112533			103.7	50 - 150
10 PFDA			1000.00	948.99	94.9	70 - 130
3 8:2 FTS			958.00	759.96	79.3	70 - 130
D 51 13C6_PFDA	617850	680491			110.1	50 - 150
D 58 d3-MeFOSAA	638732	643641			100.8	50 - 150

Report Date: 03-Aug-2021 19:53:49 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121038.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1083.23	108.3	70 - 130
9 PFDS			964.00	901.61	93.5	70 - 130
D 52 13C7_PFUdA	671685	709590			105.6	50 - 150
25 PFUdA			1000.00	994.30	99.4	70 - 130
D 60 d5-EtFOSAA	592168	605884			102.3	50 - 150
5 N-EtFOSAA			1000.00	968.89	96.9	70 - 130
D 61 d7-MeFOSE	90941	89425			98.3	50 - 150
32 MeFOSE			1000.00	963.18	96.3	70 - 130
D 57 d3-MeFOSA	54238	54577			100.6	50 - 150
26 MeFOSA			1000.00	1186.25	118.6	70 - 130
31 11Cl-PF3OUDS			942.00	863.86	91.7	70 - 130
D 62 d9-EtFOSE	95057	104249			109.7	50 - 150
33 EtFOSE			1000.00	899.77	90	70 - 130
D 59 d5-EtFOSA	51944	49490			95.3	50 - 150
27 EtFOSA			1000.00	997.76	99.8	70 - 130
11 PFDoA			1000.00	949.68	95	70 - 130
D 38 13C2_PFDoA	650962	684192			105.1	50 - 150
4 10:2 FTS			964.00	576.79	59.8	70 - 130
34 PFDOS			968.00	948.96	98	70 - 130
24 PFTrDA			1000.00	1071.77	107.2	70 - 130
23 PFTeDA			1000.00	895.99	89.6	70 - 130
D 42 13C2_PFTeDA	953398	1069874			112.2	50 - 150
D 40 13C2_PFHxDA	904421	877595			97	50 - 150
35 PFHxDA			1000.00	1052.77	105.3	70 - 130
36 PFODA			1000.00	1029.79	103	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121052.d
Injection Date: 31-Jul-2021 21:03:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 45
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	623063			98.8	50 - 150
8 PFBA			1000.00	938.76	93.9	70 - 130
D 50 13C5_PFPeA	580611	601785			103.6	50 - 150
21 PFPeA			1000.00	883.31	88.3	70 - 130
7 PFBS			884.00	818.38	92.6	70 - 130
D 44 13C3_PFBS	180931	177055			97.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	98533			90.3	50 - 150
1 4:2 FTS			934.00	898.37	96.2	70 - 130
D 49 13C5_PFHxA	669846	656607			98	50 - 150
15 PFHxA			1000.00	953.73	95.4	70 - 130
22 PFPeS			938.00	874.58	93.2	70 - 130
28 GenX			2000.00	1872.71	93.6	70 - 130
D 66 13C3_GenX	1263013	1120587			88.7	50 - 150
D 47 13C4_PFHpA	541026	554336			102.5	50 - 150
13 PFHpA			1000.00	857.30	85.7	70 - 130
D 45 13C3_PFHxS	147645	151993			102.9	50 - 150
14 PFHxS			910.00	824.27	90.6	70 - 130
29 ADONA			942.00	882.86	93.7	70 - 130
D 64 13C2_6:2 FTS_2	93519	85319			91.2	50 - 150
2 6:2 FTS			948.00	1038.91	109.6	70 - 130
20 PFOA			1000.00	971.27	97.1	70 - 130
D 53 13C8_PFOA	508929	520093			102.2	50 - 150
12 PFHpS			952.00	875.94	92	70 - 130
18 PFOS			928.00	937.47	101	70 - 130
D 54 13C8_PFOS	147774	144303			97.7	50 - 150
17 PFNA			1000.00	901.63	90.2	70 - 130
D 56 13C9_PFNA	632796	679562			107.4	50 - 150
30 9Cl-PF3ONS			932.00	926.44	99.4	70 - 130
D 55 13C8_PFOSA	286703	285565			99.6	50 - 150
19 PFOSA			1000.00	992.08	99.2	70 - 130
16 PFNS			960.00	945.32	98.5	70 - 130
D 65 13C2_8:2 FTS_2	108532	101289			93.3	50 - 150
10 PFDA			1000.00	944.01	94.4	70 - 130
3 8:2 FTS			958.00	820.56	85.7	70 - 130
D 51 13C6_PFDA	617850	603695			97.7	50 - 150
D 58 d3-MeFOSAA	638732	632027			99	50 - 150

Report Date: 03-Aug-2021 19:53:56 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121052.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1022.68	102.3	70 - 130
9 PFDS			964.00	1010.99	104.9	70 - 130
D 52 13C7_PFUdA	671685	663294			98.8	50 - 150
25 PFUdA			1000.00	932.33	93.2	70 - 130
D 60 d5-EtFOSAA	592168	563082			95.1	50 - 150
5 N-EtFOSAA			1000.00	1036.26	103.6	70 - 130
D 61 d7-MeFOSE	90941	83760			92.1	50 - 150
32 MeFOSE			1000.00	944.12	94.4	70 - 130
D 57 d3-MeFOSA	54238	51039			94.1	50 - 150
26 MeFOSA			1000.00	1059.77	106	70 - 130
31 11Cl-PF3OUDS			942.00	854.23	90.7	70 - 130
D 62 d9-EtFOSE	95057	97268			102.3	50 - 150
33 EtFOSE			1000.00	918.90	91.9	70 - 130
D 59 d5-EtFOSA	51944	44439			85.6	50 - 150
27 EtFOSA			1000.00	1110.29	111	70 - 130
11 PFDoA			1000.00	989.17	98.9	70 - 130
D 38 13C2_PFDoA	650962	622140			95.6	50 - 150
4 10:2 FTS			964.00	565.46	58.7	70 - 130
34 PFDOS			968.00	948.32	98	70 - 130
24 PFTrDA			1000.00	1145.24	114.5	70 - 130
23 PFTeDA			1000.00	928.19	92.8	70 - 130
D 42 13C2_PFTeDA	953398	938135			98.4	50 - 150
D 40 13C2_PFHxDA	904421	856460			94.7	50 - 150
35 PFHxDA			1000.00	1051.03	105.1	70 - 130
36 PFODA			1000.00	1011.31	101.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121064.d
Injection Date: 31-Jul-2021 23:11:23 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 57
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	659616			104.6	50 - 150
8 PFBA			1000.00	955.95	95.6	70 - 130
D 50 13C5_PFPeA	580611	641109			110.4	50 - 150
21 PFPeA			1000.00	932.10	93.2	70 - 130
7 PFBS			884.00	809.60	91.6	70 - 130
D 44 13C3_PFBS	180931	195271			107.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	100302			91.9	50 - 150
1 4:2 FTS			934.00	1002.23	107.3	70 - 130
D 49 13C5_PFHxA	669846	723344			108	50 - 150
15 PFHxA			1000.00	853.19	85.3	70 - 130
22 PFPeS			938.00	850.70	90.7	70 - 130
28 GenX			2000.00	2016.37	100.8	70 - 130
D 66 13C3_GenX	1263013	1184450			93.8	50 - 150
D 47 13C4_PFHpA	541026	594092			109.8	50 - 150
13 PFHpA			1000.00	845.60	84.6	70 - 130
D 45 13C3_PFHxS	147645	167862			113.7	50 - 150
14 PFHxS			910.00	806.56	88.6	70 - 130
29 ADONA			942.00	871.73	92.5	70 - 130
D 64 13C2_6:2 FTS_2	93519	90904			97.2	50 - 150
2 6:2 FTS			948.00	979.31	103.3	70 - 130
20 PFOA			1000.00	1014.23	101.4	70 - 130
D 53 13C8_PFOA	508929	549893			108	50 - 150
12 PFHpS			952.00	878.71	92.3	70 - 130
18 PFOS			928.00	867.09	93.4	70 - 130
D 54 13C8_PFOS	147774	166585			112.7	50 - 150
17 PFNA			1000.00	907.59	90.8	70 - 130
D 56 13C9_PFNA	632796	734455			116.1	50 - 150
30 9Cl-PF3ONS			932.00	815.24	87.5	70 - 130
D 55 13C8_PFOSA	286703	306730			107	50 - 150
19 PFOSA			1000.00	1005.87	100.6	70 - 130
16 PFNS			960.00	845.70	88.1	70 - 130
D 65 13C2_8:2 FTS_2	108532	104122			95.9	50 - 150
10 PFDA			1000.00	847.68	84.8	70 - 130
3 8:2 FTS			958.00	952.38	99.4	70 - 130
D 51 13C6_PFDA	617850	718232			116.2	50 - 150
D 58 d3-MeFOSAA	638732	631226			98.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1055.69	105.6	70 - 130
9 PFDS			964.00	858.33	89	70 - 130
D 52 13C7_PFUdA	671685	754230			112.3	50 - 150
25 PFUdA			1000.00	939.78	94	70 - 130
D 60 d5-EtFOSAA	592168	598063			101	50 - 150
5 N-EtFOSAA			1000.00	1001.42	100.1	70 - 130
D 61 d7-MeFOSE	90941	83481			91.8	50 - 150
32 MeFOSE			1000.00	1036.03	103.6	70 - 130
D 57 d3-MeFOSA	54238	50069			92.3	50 - 150
26 MeFOSA			1000.00	1174.79	117.5	70 - 130
31 11Cl-PF3OUDS			942.00	865.35	91.9	70 - 130
D 62 d9-EtFOSE	95057	104693			110.1	50 - 150
33 EtFOSE			1000.00	867.32	86.7	70 - 130
D 59 d5-EtFOSA	51944	52139			100.4	50 - 150
27 EtFOSA			1000.00	1066.76	106.7	70 - 130
11 PFDoA			1000.00	1017.09	101.7	70 - 130
D 38 13C2_PFDoA	650962	699334			107.4	50 - 150
4 10:2 FTS			964.00	725.40	75.2	70 - 130
34 PFDOS			968.00	895.15	92.5	70 - 130
24 PFTrDA			1000.00	1104.07	110.4	70 - 130
23 PFTeDA			1000.00	856.59	85.7	70 - 130
D 42 13C2_PFTeDA	953398	1131177			118.6	50 - 150
D 40 13C2_PFHxDA	904421	943368			104.3	50 - 150
35 PFHxDA			1000.00	1085.13	108.5	70 - 130
36 PFODA			1000.00	1024.25	102.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121072.d
Injection Date: 01-Aug-2021 00:36:49 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 65
Sample Info: ID CCV 1000D_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	685378			108.7	50 - 150
8 PFBA			1000.00	926.89	92.7	70 - 130
D 50 13C5_PFPeA	580611	650218			112	50 - 150
21 PFPeA			1000.00	879.27	87.9	70 - 130
7 PFBS			884.00	783.26	88.6	70 - 130
D 44 13C3_PFBS	180931	205782			113.7	50 - 150
D 63 13C2_4:2 FTS_2	109162	99884			91.5	50 - 150
1 4:2 FTS			934.00	1062.33	113.7	70 - 130
D 49 13C5_PFHxA	669846	746812			111.5	50 - 150
15 PFHxA			1000.00	854.67	85.5	70 - 130
22 PFPeS			938.00	754.46	80.4	70 - 130
28 GenX			2000.00	2018.65	100.9	70 - 130
D 66 13C3_GenX	1263013	1208923			95.7	50 - 150
D 47 13C4_PFHpA	541026	590171			109.1	50 - 150
13 PFHpA			1000.00	939.31	93.9	70 - 130
D 45 13C3_PFHxS	147645	174499			118.2	50 - 150
14 PFHxS			910.00	779.90	85.7	70 - 130
29 ADONA			942.00	846.07	89.8	70 - 130
D 64 13C2_6:2 FTS_2	93519	96789			103.5	50 - 150
2 6:2 FTS			948.00	1035.28	109.2	70 - 130
20 PFOA			1000.00	970.89	97.1	70 - 130
D 53 13C8_PFOA	508929	564751			111	50 - 150
12 PFHpS			952.00	816.79	85.8	70 - 130
18 PFOS			928.00	857.78	92.4	70 - 130
D 54 13C8_PFOS	147774	162659			110.1	50 - 150
17 PFNA			1000.00	950.29	95	70 - 130
D 56 13C9_PFNA	632796	704499			111.3	50 - 150
30 9Cl-PF3ONS			932.00	846.36	90.8	70 - 130
D 55 13C8_PFOSA	286703	291887			101.8	50 - 150
19 PFOSA			1000.00	1025.10	102.5	70 - 130
16 PFNS			960.00	877.73	91.4	70 - 130
D 65 13C2_8:2 FTS_2	108532	109938			101.3	50 - 150
10 PFDA			1000.00	968.24	96.8	70 - 130
3 8:2 FTS			958.00	923.65	96.4	70 - 130
D 51 13C6_PFDA	617850	661395			107	50 - 150
D 58 d3-MeFOSAA	638732	663613			103.9	50 - 150

Report Date: 03-Aug-2021 19:54:08 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121072.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	999.05	99.9	70 - 130
9 PFDS			964.00	1004.42	104.2	70 - 130
D 52 13C7_PFUdA	671685	738423			109.9	50 - 150
25 PFUdA			1000.00	920.43	92	70 - 130
D 60 d5-EtFOSAA	592168	609303			102.9	50 - 150
5 N-EtFOSAA			1000.00	958.67	95.9	70 - 130
D 61 d7-MeFOSE	90941	85167			93.7	50 - 150
32 MeFOSE			1000.00	1023.20	102.3	70 - 130
D 57 d3-MeFOSA	54238	55678			102.7	50 - 150
26 MeFOSA			1000.00	1221.62	122.2	70 - 130
31 11Cl-PF3OUDS			942.00	853.32	90.6	70 - 130
D 62 d9-EtFOSE	95057	112654			118.5	50 - 150
33 EtFOSE			1000.00	871.79	87.2	70 - 130
D 59 d5-EtFOSA	51944	49786			95.8	50 - 150
27 EtFOSA			1000.00	1067.92	106.8	70 - 130
11 PFDoA			1000.00	1041.78	104.2	70 - 130
D 38 13C2_PFDoA	650962	703014			108	50 - 150
4 10:2 FTS			964.00	627.59	65.1	70 - 130
34 PFDOS			968.00	907.38	93.7	70 - 130
24 PFTrDA			1000.00	1090.36	109	70 - 130
23 PFTeDA			1000.00	928.40	92.8	70 - 130
D 42 13C2_PFTeDA	953398	1039288			109	50 - 150
D 40 13C2_PFHxDA	904421	913959			101.1	50 - 150
35 PFHxDA			1000.00	1066.12	106.6	70 - 130
36 PFODA			1000.00	1025.79	102.6	70 - 130

Report Date: 04-Aug-2021 18:09:56 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\organics\LL\LCMSMS01.i\080321-DOD.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 29-Jul-2021 21:47:58 Cal End Date: 29-Jul-2021 23:23:24

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	03-Aug-2021 09:07:44	080321005.d	CCV					Analytes	L-2	1.00		GenX high - NCM/ND
96	ID CCV 200_SVLC-1547	03-Aug-2021 09:18:18	080321006.d	CCV					Analytes	L-3	1.00		RR-2X, MeFOSE low
96	ID CCV 200A_SVLC-1547	03-Aug-2021 10:04:57	080321010.d	CCV					Analytes	L-3	1.00		All pass
96	ID CCV 200A CONF_SVLC-1547	03-Aug-2021 10:15:29	080321011.d	CCV					Analytes	L-3	1.00		Confirms all pass
97	ID IBLK A	03-Aug-2021 10:26:02	080321012.d	InstBlk					Surrogates	Smp	0.1100		
1	WG20004-013	03-Aug-2021 10:36:37	080321013.d	Client	AOPC5-14039A-071421	Aqueous	100	10113	Surrogates	Smp	0.1100		
2	WQ10675-001	03-Aug-2021 10:47:09	080321014.d	MBlk		Aqueous	1	10675	Surrogates	Smp	0.1100		
3	WQ10675-002	03-Aug-2021 10:57:41	080321015.d	LCS		Aqueous	1	10675	Analytes	100x PDS	0.2000		RR-6:2FTS HIGH, MEFOSA SUR LOW
4	WG22011-003	03-Aug-2021 11:08:16	080321016.d	Client	AOPC3-W7-3-071921-FD	Aqueous	1	10675	Surrogates	Smp	0.1100		
5	WG22011-004	03-Aug-2021 11:18:49	080321017.d	Client	AOPC3-W7-11-071921	Aqueous	1	10675	Surrogates	Smp	0.1100		
6	WG22011-005	03-Aug-2021 11:29:24	080321018.d	Client	AOPC03-W7-13-071921	Aqueous	1	10675	Surrogates	Smp	0.1100		
7	WG22011-006	03-Aug-2021 11:39:57	080321019.d	Client	AOPC03-UST-MW-02-071921	Aqueous	1	10675	Surrogates	Smp	0.1100		OK, RX is for PFPeS
8	WG22011-008	03-Aug-2021 11:50:33	080321020.d	Client	AOPC21-W6-6-071921	Aqueous	1	10675	Surrogates	Smp	0.1100		
9	WG30020-001	03-Aug-2021 12:01:10	080321021.d	Client	AFFF01-FRB-01-072921-T2	Aqueous	1	10675	Surrogates	Smp	0.1100		
10	WQ10710-001	03-Aug-2021 12:11:49	080321022.d	MBlk		Aqueous	1	10710	Surrogates	Smp	0.1100		DETECTS CONFIRM, REPORT ORIG
11	WQ10452-001	03-Aug-2021 12:22:28	080321023.d	MBlk		Aqueous	1	10452	Surrogates	Smp	0.1100		RR-MeFOSA sur low
12	WQ10452-002	03-Aug-2021 12:33:01	080321024.d	LCS		Aqueous	1	10452	Analytes	100x PDS	0.2000		GenX high, OK if ND
13	WG22011-014	03-Aug-2021 12:43:33	080321025.d	Client	AOPC21-WU5-10-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
14	WG22011-015	03-Aug-2021 12:54:06	080321026.d	Client	AOPC21-W4-6-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
15	WG22011-016	03-Aug-2021 13:04:39	080321027.d	Client	FB-10-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
16	CCV 1000_SVLC-1573	03-Aug-2021 13:15:12	080321028.d	CCV					Analytes	L-5	1.00		
100	CCB C1	03-Aug-2021 13:25:47	080321029.d	InstBlk					Surrogates	Smp	0.1100		
17	WG22011-017	03-Aug-2021 13:36:28	080321030.d	Client	AOPC10-WGC2-13-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		
18	WG22011-018	03-Aug-2021 13:47:02	080321031.d	Client	AOPC10-WGC2-8-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		
19	WG22011-019	03-Aug-2021 13:57:36	080321032.d	Client	AOPC10-WGC2-10-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		several sur low-NCM/MTX, 4:2 sur high-NCM/ND
20	WG22011-020	03-Aug-2021 14:08:13	080321033.d	Client	AOPC10-WGC2-1-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		
21	WG22011-021	03-Aug-2021 14:18:53	080321034.d	Client	FB-11-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		
22	WG22019-004	03-Aug-2021 14:29:25	080321035.d	Client	RRAD-FFTA-EB-SE-1-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
23	WG22019-008	03-Aug-2021 14:39:59	080321036.d	Client	RRAD-FFTA-EB-S0-1-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
24	WG22019-009	03-Aug-2021 14:50:33	080321037.d	Client	RRAD-FFTA-SB-1-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
25	WG22019-010	03-Aug-2021 15:01:06	080321038.d	Client	RRAD-FFTA-FB-1-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
26	WG22067-001	03-Aug-2021 15:11:43	080321039.d	Client	DPG-IDW-AQ-2-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		several sur low, NCM/MTX. RX-8:2 sur high-detect
27	CCV 1000A_SVLC-1573	03-Aug-2021 15:22:17	080321040.d	CCV					Analytes	L-5	1.00		
100	CCB C2	03-Aug-2021 15:32:53	080321041.d	InstBlk					Surrogates	Smp	0.1100		
28	WG22086-001	03-Aug-2021 15:43:35	080321042.d	Client	DPG-EB-07-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
29	WG22086-002	03-Aug-2021 15:54:11	080321043.d	Client	DPG-EB-08-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
30	WG22086-003	03-Aug-2021 16:04:47	080321044.d	Client	DPG-EB-09-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
31	WG22086-004	03-Aug-2021 16:15:26	080321045.d	Client	DPG-EB-10-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
32	WG22086-011	03-Aug-2021 16:25:59	080321046.d	Client	DPG-WW06-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
33	WG22086-011MS	03-Aug-2021 16:36:32	080321047.d	MS		Aqueous	1	10452	Analytes	100x PDS	0.2000		
34	WG22086-011MD	03-Aug-2021 16:47:07	080321048.d	MSD		Aqueous	1	10452	Analytes	100x PDS	0.2000		
35	WG22086-012	03-Aug-2021 16:57:42	080321049.d	Client	DPG-FB-06-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
36	WG22086-013	03-Aug-2021 17:08:17	080321050.d	Client	DPG-FD-04-GW-072021	Aqueous	1	10452	Surrogates	Smp	0.1100		
37	CCV 1000B_SVLC-1573	03-Aug-2021 17:18:53	080321051.d	CCV					Analytes	L-5	1.00		

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
100	CCB C3	03-Aug-2021 17:29:37	080321052.d	InstBlk					Surrogates	Smp	0.1100		
38	WG27059-001	03-Aug-2021 17:40:19	080321053.d	Client	Shaw-source-007	Aqueous	1	10710	Surrogates	Smp	0.1100		rx confirms
39	WG27059-003	03-Aug-2021 17:50:56	080321054.d	Client	Shaw-source-001	Aqueous	1	10710	Surrogates	Smp	0.1100		rx confirms
40	WG31016-017	03-Aug-2021 18:01:33	080321055.d	Client	AFFF21-GW05-16-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		6:2 CCV NCM/ND
41	WG31016-018	03-Aug-2021 18:12:14	080321056.d	Client	AFFF21-GW29-22-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		RR-6:2 CCV
42	WG31016-019	03-Aug-2021 18:22:46	080321057.d	Client	AFFF21-GW29-15-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		RR-6:2 CCV
43	WG31016-020	03-Aug-2021 18:33:21	080321058.d	Client	AFFF21-GW01-23-073021-00	Aqueous	1	10710	Surrogates	Smp	0.1100		SEVERAL SURS LOW-NCM/MTX, RR-6:2 CCV
44	WG31016-021	03-Aug-2021 18:43:57	080321059.d	Client	AFFF21-GW01-15-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		RR-6:2 CCV
45	WQ10798-001	03-Aug-2021 18:54:32	080321060.d	Client		Soil	1	10798	Surrogates	Smp	0.1100		
46	WQ10798-002	03-Aug-2021 19:05:09	080321061.d	LCS		Soil	1	10798	Analytes	100x PDS	0.1000		RR-6:2 LOW
47	CCV 1000C_SVLC-1573	03-Aug-2021 19:15:44	080321062.d	CCV					Analytes	L-5	1.00		6:2 HIGH-NCM/ND
100	CCB C4	03-Aug-2021 19:26:21	080321063.d	InstBlk					Surrogates	Smp	0.1100		
48	WQ10069-002	03-Aug-2021 19:37:03	080321064.d	LCS		Soil	1	10069	Analytes	100x PDS	0.1000		GenX(133%);6:2(55%);
53	CCV 1000D_SVLC-1573	03-Aug-2021 20:30:07	080321069.d	CCV					Analytes	L-5	1.00		6:2 HIGH
100	CCB C5	03-Aug-2021 20:40:42	080321070.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321005.d
Injection Date: 03-Aug-2021 09:07:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	990916	1185130			119.6	50 - 150
8 PFBA			100.00	110.79	110.8	70 - 130
D 50 13C5_PFPeA	982365	1263824			128.7	50 - 150
21 PFPeA			100.00	92.038	92	70 - 130
7 PFBS			88.400	100.95	114.2	70 - 130
D 44 13C3_PFBS	320750	312372			97.4	50 - 150
1 4:2 FTS			93.400	97.010	103.9	70 - 130
D 63 13C2_4:2 FTS_2	181959	369798			203.2	50 - 150
D 49 13C5_PFHxA	893485	1074983			120.3	50 - 150
15 PFHxA			100.00	98.295	98.3	70 - 130
22 PFPeS			93.800	102.50	109.3	70 - 130
28 GenX			200.00	283.68	141.8	70 - 130
D 66 13C3_GenX	951332	701708			73.8	50 - 150
D 47 13C4_PFHpA	922437	1078744			116.9	50 - 150
13 PFHpA			100.00	89.299	89.3	70 - 130
D 45 13C3_PFHxS	285748	306958			107.4	50 - 150
14 PFHxS			91.000	86.646	95.2	70 - 130
29 ADONA			94.200	111.73	118.6	70 - 130
D 64 13C2_6:2 FTS_2	173084	297562			171.9	50 - 150
2 6:2 FTS			94.800	96.686	102	70 - 130
20 PFOA			100.00	118.32	118.3	70 - 130
D 53 13C8_PFOA	898114	1021364			113.7	50 - 150
12 PFHpS			95.200	103.30	108.5	70 - 130
D 54 13C8_PFOS	231032	258986			112.1	50 - 150
18 PFOS			92.800	112.46	121.2	70 - 130
17 PFNA			100.00	107.84	107.8	70 - 130
D 56 13C9_PFNA	946451	1016403			107.4	50 - 150
30 9Cl-PF3ONS			93.200	95.967	103	70 - 130
D 55 13C8_PFOSA	436299	491853			112.7	50 - 150
19 PFOSA			100.00	103.76	103.8	70 - 130
16 PFNS			96.000	110.67	115.3	70 - 130
3 8:2 FTS			95.800	108.56	113.3	70 - 130
D 65 13C2_8:2 FTS_2	143251	286368			199.9	50 - 150
10 PFDA			100.00	92.911	92.9	70 - 130
D 51 13C6_PFDA	841891	988943			117.5	50 - 150
D 58 d3-MeFOSAA	946710	1304722			137.8	50 - 150

NO SAMPLES ASSOCIATED

Report Date: 04-Aug-2021 18:08:42 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\080321-DOD.b\080321005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	116.79	116.8	70 - 130
9 PFDS			96.400	101.78	105.6	70 - 130
25 PFUdA			100.00	106.15	106.2	70 - 130
D 60 d5-EtFOSAA	904763	1171880			129.5	50 - 150
D 52 13C7_PFUdA	794661	820462			103.2	50 - 150
5 N-EtFOSAA			100.00	114.98	115	70 - 130
D 61 d7-MeFOSE	194596	147736			75.9	50 - 150
32 MeFOSE			100.00	109.39	109.4	70 - 130
26 MeFOSA			100.00	125.43	125.4	70 - 130
D 57 d3-MeFOSA	57993	85068			146.7	50 - 150
31 11Cl-PF3OUDS			94.200	94.732	100.6	70 - 130
D 62 d9-EtFOSE	171262	149942			87.6	50 - 150
33 EtFOSE			100.00	106.26	106.3	70 - 130
D 59 d5-EtFOSA	53294	61503			115.4	50 - 150
27 EtFOSA			100.00	163.52	163.5	70 - 130
D 38 13C2_PFDoA	852283	898934			105.5	50 - 150
11 PFDoA			100.00	99.825	99.8	70 - 130
4 10:2 FTS			96.400	102.90	106.7	70 - 130
34 PFDOS			96.800	81.705	84.4	70 - 130
24 PFTrDA			100.00	97.166	97.2	70 - 130
23 PFTeDA			100.00	103.96	104	70 - 130
D 42 13C2_PFTeDA	863033	977593			113.3	50 - 150
35 PFHxDA			100.00	114.79	114.8	70 - 130
D 40 13C2_PFHxDA	495251	482998			97.5	50 - 150
36 PFODA			100.00	80.667	80.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321006.d
Injection Date: 03-Aug-2021 09:18:18 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1222021			103.1	50 - 150
8 PFBA			200.00	202.72	101.4	70 - 130
D 50 13C5_PFPeA	1263824	1179139			93.3	50 - 150
21 PFPeA			200.00	198.59	99.3	70 - 130
7 PFBS			176.80	172.82	97.7	70 - 130
D 44 13C3_PFBS	312372	345490			110.6	50 - 150
1 4:2 FTS			186.80	212.39	113.7	70 - 130
D 63 13C2_4:2 FTS_2	369798	354707			95.9	50 - 150
D 49 13C5_PFHxA	1074983	1058163			98.4	50 - 150
15 PFHxA			200.00	196.63	98.3	70 - 130
22 PFPeS			187.60	196.17	104.6	70 - 130
28 GenX			400.00	521.11	130.3	70 - 130
D 66 13C3_GenX	701708	688193			98.1	50 - 150
D 47 13C4_PFHpA	1078744	1086850			100.8	50 - 150
13 PFHpA			200.00	163.08	81.5	70 - 130
D 45 13C3_PFHxS	306958	296968			96.7	50 - 150
14 PFHxS			182.00	199.37	109.5	70 - 130
29 ADONA			188.40	226.54	120.2	70 - 130
D 64 13C2_6:2 FTS_2	297562	318841			107.2	50 - 150
2 6:2 FTS			189.60	181.80	95.9	70 - 130
20 PFOA			200.00	198.02	99	70 - 130
D 53 13C8_PFOA	1021364	1061790			104	50 - 150
12 PFHpS			190.40	182.35	95.8	70 - 130
D 54 13C8_PFOS	258986	261992			101.2	50 - 150
18 PFOS			185.60	199.97	107.7	70 - 130
17 PFNA			200.00	213.38	106.7	70 - 130
D 56 13C9_PFNA	1016403	969567			95.4	50 - 150
30 9Cl-PF3ONS			186.40	185.42	99.5	70 - 130
D 55 13C8_PFOSA	491853	543165			110.4	50 - 150
19 PFOSA			200.00	210.82	105.4	70 - 130
16 PFNS			192.00	192.57	100.3	70 - 130
3 8:2 FTS			191.60	192.77	100.6	70 - 130
D 65 13C2_8:2 FTS_2	286368	299745			104.7	50 - 150
10 PFDA			200.00	219.97	110	70 - 130
D 51 13C6_PFDA	988943	896895			90.7	50 - 150
D 58 d3-MeFOSAA	1304722	1293733			99.2	50 - 150

NO SAMPLES ASSOCIATED

Report Date: 04-Aug-2021 18:08:43 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\080321-DOD.b\080321006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	211.63	105.8	70 - 130
9 PFDS			192.80	202.01	104.8	70 - 130
25 PFUdA			200.00	258.18	129.1	70 - 130
D 60 d5-EtFOSAA	1171880	1178972			100.6	50 - 150
D 52 13C7_PFUdA	820462	795468			97	50 - 150
5 N-EtFOSAA			200.00	212.50	106.2	70 - 130
D 61 d7-MeFOSE	147736	206407			139.7	50 - 150
32 MeFOSE			200.00	133.72	66.9	70 - 130
26 MeFOSA			200.00	202.87	101.4	70 - 130
D 57 d3-MeFOSA	85068	75246			88.5	50 - 150
31 11Cl-PF3OUDS			188.40	156.17	82.9	70 - 130
D 62 d9-EtFOSE	149942	148922			99.3	50 - 150
33 EtFOSE			200.00	209.82	104.9	70 - 130
D 59 d5-EtFOSA	61503	61653			100.2	50 - 150
27 EtFOSA			200.00	214.81	107.4	70 - 130
D 38 13C2_PFDoA	898934	838028			93.2	50 - 150
11 PFDoA			200.00	258.82	129.4	70 - 130
4 10:2 FTS			192.80	185.95	96.4	70 - 130
34 PFDOS			193.60	188.80	97.5	70 - 130
24 PFTrDA			200.00	194.00	97	70 - 130
23 PFTeDA			200.00	206.69	103.3	70 - 130
D 42 13C2_PFTeDA	977593	975218			99.8	50 - 150
35 PFHxDA			200.00	214.41	107.2	70 - 130
D 40 13C2_PFHxDA	482998	478223			99	50 - 150
36 PFODA			200.00	162.29	81.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321010.d
Injection Date: 03-Aug-2021 10:04:57 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200A_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1222975			103.2	50 - 150
8 PFBA			200.00	208.44	104.2	70 - 130
D 50 13C5_PFPeA	1263824	1144631			90.6	50 - 150
21 PFPeA			200.00	215.06	107.5	70 - 130
7 PFBS			176.80	164.55	93.1	70 - 130
D 44 13C3_PFBS	312372	373980			119.7	50 - 150
1 4:2 FTS			186.80	217.90	116.7	70 - 130
D 63 13C2_4:2 FTS_2	369798	357094			96.6	50 - 150
D 49 13C5_PFHxA	1074983	1025040			95.4	50 - 150
15 PFHxA			200.00	213.80	106.9	70 - 130
22 PFPeS			187.60	195.53	104.2	70 - 130
28 GenX			400.00	501.03	125.3	70 - 130
D 66 13C3_GenX	701708	768135			109.5	50 - 150
D 47 13C4_PFHpA	1078744	1114276			103.3	50 - 150
13 PFHpA			200.00	172.45	86.2	70 - 130
D 45 13C3_PFHxS	306958	300274			97.8	50 - 150
14 PFHxS			182.00	194.76	107	70 - 130
29 ADONA			188.40	191.68	101.7	70 - 130
D 64 13C2_6:2 FTS_2	297562	303485			102	50 - 150
2 6:2 FTS			189.60	206.31	108.8	70 - 130
20 PFOA			200.00	201.27	100.6	70 - 130
D 53 13C8_PFOA	1021364	1075940			105.3	50 - 150
12 PFHpS			190.40	203.72	107	70 - 130
D 54 13C8_PFOS	258986	270799			104.6	50 - 150
18 PFOS			185.60	194.90	105	70 - 130
17 PFNA			200.00	207.17	103.6	70 - 130
D 56 13C9_PFNA	1016403	1029709			101.3	50 - 150
30 9Cl-PF3ONS			186.40	170.89	91.7	70 - 130
D 55 13C8_PFOSA	491853	487846			99.2	50 - 150
19 PFOSA			200.00	200.26	100.1	70 - 130
16 PFNS			192.00	202.58	105.5	70 - 130
3 8:2 FTS			191.60	236.43	123.4	70 - 130
D 65 13C2_8:2 FTS_2	286368	303915			106.1	50 - 150
10 PFDA			200.00	206.93	103.5	70 - 130
D 51 13C6_PFDA	988943	884093			89.4	50 - 150
D 58 d3-MeFOSAA	1304722	1405859			107.8	50 - 150

NO SAMPLES ASSOCIATED

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	180.77	90.4	70 - 130
9 PFDS			192.80	209.95	108.9	70 - 130
25 PFUdA			200.00	206.24	103.1	70 - 130
D 60 d5-EtFOSAA	1171880	1185634			101.2	50 - 150
D 52 13C7_PFUdA	820462	874174			106.5	50 - 150
5 N-EtFOSAA			200.00	219.25	109.6	70 - 130
D 61 d7-MeFOSE	147736	147052			99.5	50 - 150
32 MeFOSE			200.00	250.41	125.2	70 - 130
26 MeFOSA			200.00	210.53	105.3	70 - 130
D 57 d3-MeFOSA	85068	66164			77.8	50 - 150
31 11Cl-PF3OUDS			188.40	158.69	84.2	70 - 130
D 62 d9-EtFOSE	149942	150688			100.5	50 - 150
33 EtFOSE			200.00	232.24	116.1	70 - 130
D 59 d5-EtFOSA	61503	63216			102.8	50 - 150
27 EtFOSA			200.00	187.73	93.9	70 - 130
D 38 13C2_PFDoA	898934	832475			92.6	50 - 150
11 PFDoA			200.00	213.87	106.9	70 - 130
4 10:2 FTS			192.80	197.75	102.6	70 - 130
34 PFDOS			193.60	172.55	89.1	70 - 130
24 PFTrDA			200.00	189.65	94.8	70 - 130
23 PFTeDA			200.00	203.07	101.5	70 - 130
D 42 13C2_PFTeDA	977593	997255			102	50 - 150
35 PFHxDA			200.00	230.48	115.2	70 - 130
D 40 13C2_PFHxDA	482998	446658			92.5	50 - 150
36 PFODA			200.00	171.06	85.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321011.d
Injection Date: 03-Aug-2021 10:15:29 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200A CONF_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1225669			103.4	50 - 150
8 PFBA			200.00	201.58	100.8	70 - 130
D 50 13C5_PFPeA	1263824	1183499			93.6	50 - 150
21 PFPeA			200.00	209.32	104.7	70 - 130
7 PFBS			176.80	181.11	102.4	70 - 130
D 44 13C3_PFBS	312372	340973			109.2	50 - 150
1 4:2 FTS			186.80	194.54	104.1	70 - 130
D 63 13C2_4:2 FTS_2	369798	340984			92.2	50 - 150
D 49 13C5_PFHxA	1074983	915787			85.2	50 - 150
15 PFHxA			200.00	233.48	116.7	70 - 130
22 PFPeS			187.60	202.62	108	70 - 130
28 GenX			400.00	502.59	125.6	70 - 130
D 66 13C3_GenX	701708	702837			100.2	50 - 150
D 47 13C4_PFHpA	1078744	1073240			99.5	50 - 150
13 PFHpA			200.00	191.09	95.5	70 - 130
D 45 13C3_PFHxS	306958	300181			97.8	50 - 150
14 PFHxS			182.00	188.05	103.3	70 - 130
29 ADONA			188.40	189.56	100.6	70 - 130
D 64 13C2_6:2 FTS_2	297562	319567			107.4	50 - 150
2 6:2 FTS			189.60	214.54	113.2	70 - 130
20 PFOA			200.00	200.41	100.2	70 - 130
D 53 13C8_PFOA	1021364	1028200			100.7	50 - 150
12 PFHpS			190.40	193.67	101.7	70 - 130
D 54 13C8_PFOS	258986	271036			104.7	50 - 150
18 PFOS			185.60	196.62	105.9	70 - 130
17 PFNA			200.00	229.08	114.5	70 - 130
D 56 13C9_PFNA	1016403	1040530			102.4	50 - 150
30 9Cl-PF3ONS			186.40	178.56	95.8	70 - 130
D 55 13C8_PFOSA	491853	501043			101.9	50 - 150
19 PFOSA			200.00	212.14	106.1	70 - 130
16 PFNS			192.00	183.54	95.6	70 - 130
3 8:2 FTS			191.60	173.69	90.7	70 - 130
D 65 13C2_8:2 FTS_2	286368	302154			105.5	50 - 150
10 PFDA			200.00	197.32	98.7	70 - 130
D 51 13C6_PFDA	988943	975094			98.6	50 - 150
D 58 d3-MeFOSAA	1304722	1303279			99.9	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	237.92	119	70 - 130
9 PFDS			192.80	202.73	105.1	70 - 130
25 PFUdA			200.00	210.03	105	70 - 130
D 60 d5-EtFOSAA	1171880	1268290			108.2	50 - 150
D 52 13C7_PFUdA	820462	907565			110.6	50 - 150
5 N-EtFOSAA			200.00	176.50	88.2	70 - 130
D 61 d7-MeFOSE	147736	148779			100.7	50 - 150
32 MeFOSE			200.00	242.14	121.1	70 - 130
26 MeFOSA			200.00	231.59	115.8	70 - 130
D 57 d3-MeFOSA	85068	70554			82.9	50 - 150
31 11Cl-PF3OUDS			188.40	161.19	85.6	70 - 130
D 62 d9-EtFOSE	149942	140531			93.7	50 - 150
33 EtFOSE			200.00	217.82	108.9	70 - 130
D 59 d5-EtFOSA	61503	67484			109.7	50 - 150
27 EtFOSA			200.00	185.60	92.8	70 - 130
D 38 13C2_PFDoA	898934	818788			91.1	50 - 150
11 PFDoA			200.00	227.41	113.7	70 - 130
4 10:2 FTS			192.80	165.38	85.8	70 - 130
34 PFDOS			193.60	191.14	98.7	70 - 130
24 PFTrDA			200.00	192.77	96.4	70 - 130
23 PFTeDA			200.00	197.63	98.8	70 - 130
D 42 13C2_PFTeDA	977593	1024319			104.8	50 - 150
35 PFHxDA			200.00	205.20	102.6	70 - 130
D 40 13C2_PFHxDA	482998	494826			102.4	50 - 150
36 PFODA			200.00	159.64	79.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321028.d
Injection Date: 03-Aug-2021 13:15:12 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 16
Sample Info: CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1284187			108.4	50 - 150
8 PFBA			1000.00	884.58	88.5	70 - 130
D 50 13C5_PFPeA	1263824	1188281			94	50 - 150
21 PFPeA			1000.00	958.06	95.8	70 - 130
7 PFBS			884.00	801.42	90.7	70 - 130
D 44 13C3_PFBS	312372	360939			115.5	50 - 150
1 4:2 FTS			934.00	1038.41	111.2	70 - 130
D 63 13C2_4:2 FTS_2	369798	314426			85	50 - 150
D 49 13C5_PFHxA	1074983	1061998			98.8	50 - 150
15 PFHxA			1000.00	955.03	95.5	70 - 130
22 PFPeS			938.00	808.85	86.2	70 - 130
28 GenX			2000.00	2472.23	123.6	70 - 130
D 66 13C3_GenX	701708	716093			102	50 - 150
D 47 13C4_PFHpA	1078744	1181049			109.5	50 - 150
13 PFHpA			1000.00	793.41	79.3	70 - 130
D 45 13C3_PFHxS	306958	335435			109.3	50 - 150
14 PFHxS			910.00	791.80	87	70 - 130
29 ADONA			942.00	888.90	94.4	70 - 130
D 64 13C2_6:2 FTS_2	297562	305395			102.6	50 - 150
2 6:2 FTS			948.00	1179.38	124.4	70 - 130
20 PFOA			1000.00	871.36	87.1	70 - 130
D 53 13C8_PFOA	1021364	1135943			111.2	50 - 150
12 PFHpS			952.00	819.73	86.1	70 - 130
D 54 13C8_PFOS	258986	275889			106.5	50 - 150
18 PFOS			928.00	828.81	89.3	70 - 130
17 PFNA			1000.00	759.03	75.9	70 - 130
D 56 13C9_PFNA	1016403	1311897			129.1	50 - 150
30 9Cl-PF3ONS			932.00	853.98	91.6	70 - 130
D 55 13C8_PFOSA	491853	449293			91.3	50 - 150
19 PFOSA			1000.00	1106.28	110.6	70 - 130
16 PFNS			960.00	860.42	89.6	70 - 130
3 8:2 FTS			958.00	1021.25	106.6	70 - 130
D 65 13C2_8:2 FTS_2	286368	270628			94.5	50 - 150
10 PFDA			1000.00	951.70	95.2	70 - 130
D 51 13C6_PFDA	988943	968760			98	50 - 150
D 58 d3-MeFOSAA	1304722	1260144			96.6	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1007.79	100.8	70 - 130
9 PFDS			964.00	896.49	93	70 - 130
25 PFUdA			1000.00	957.41	95.7	70 - 130
D 60 d5-EtFOSAA	1171880	1081556			92.3	50 - 150
D 52 13C7_PFUdA	820462	851741			103.8	50 - 150
5 N-EtFOSAA			1000.00	1078.20	107.8	70 - 130
D 61 d7-MeFOSE	147736	143804			97.3	50 - 150
32 MeFOSE			1000.00	1034.00	103.4	70 - 130
26 MeFOSA			1000.00	1251.81	125.2	70 - 130
D 57 d3-MeFOSA	85068	60120			70.7	50 - 150
31 11Cl-PF3OUDS			942.00	776.77	82.5	70 - 130
D 62 d9-EtFOSE	149942	139779			93.2	50 - 150
33 EtFOSE			1000.00	1031.72	103.2	70 - 130
D 59 d5-EtFOSA	61503	59161			96.2	50 - 150
27 EtFOSA			1000.00	955.32	95.5	70 - 130
D 38 13C2_PFDoA	898934	898105			99.9	50 - 150
11 PFDoA			1000.00	916.71	91.7	70 - 130
4 10:2 FTS			964.00	1002.90	104	70 - 130
34 PFDOS			968.00	812.08	83.9	70 - 130
24 PFTrDA			1000.00	863.97	86.4	70 - 130
23 PFTeDA			1000.00	999.70	100	70 - 130
D 42 13C2_PFTeDA	977593	1044027			106.8	50 - 150
35 PFHxDA			1000.00	976.06	97.6	70 - 130
D 40 13C2_PFHxDA	482998	469444			97.2	50 - 150
36 PFODA			1000.00	792.35	79.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321040.d
Injection Date: 03-Aug-2021 15:22:17 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 27
Sample Info: CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1193730			100.7	50 - 150
8 PFBA			1000.00	914.54	91.5	70 - 130
D 50 13C5_PFPeA	1263824	1146092			90.7	50 - 150
21 PFPeA			1000.00	984.75	98.5	70 - 130
7 PFBS			884.00	824.23	93.2	70 - 130
D 44 13C3_PFBS	312372	329568			105.5	50 - 150
1 4:2 FTS			934.00	1091.64	116.9	70 - 130
D 63 13C2_4:2 FTS_2	369798	316907			85.7	50 - 150
D 49 13C5_PFHxA	1074983	1030253			95.8	50 - 150
15 PFHxA			1000.00	913.11	91.3	70 - 130
22 PFPeS			938.00	849.50	90.6	70 - 130
28 GenX			2000.00	2560.30	128	70 - 130
D 66 13C3_GenX	701708	659682			94	50 - 150
D 47 13C4_PFHpA	1078744	1099561			101.9	50 - 150
13 PFHpA			1000.00	765.29	76.5	70 - 130
D 45 13C3_PFHxS	306958	293997			95.8	50 - 150
14 PFHxS			910.00	828.90	91.1	70 - 130
29 ADONA			942.00	1019.41	108.2	70 - 130
D 64 13C2_6:2 FTS_2	297562	298479			100.3	50 - 150
2 6:2 FTS			948.00	1136.26	119.9	70 - 130
20 PFOA			1000.00	908.62	90.9	70 - 130
D 53 13C8_PFOA	1021364	1054515			103.2	50 - 150
12 PFHpS			952.00	893.77	93.9	70 - 130
D 54 13C8_PFOS	258986	249359			96.3	50 - 150
18 PFOS			928.00	876.49	94.4	70 - 130
17 PFNA			1000.00	922.57	92.3	70 - 130
D 56 13C9_PFNA	1016403	1032602			101.6	50 - 150
30 9Cl-PF3ONS			932.00	877.88	94.2	70 - 130
D 55 13C8_PFOSA	491853	567516			115.4	50 - 150
19 PFOSA			1000.00	821.08	82.1	70 - 130
16 PFNS			960.00	897.89	93.5	70 - 130
3 8:2 FTS			958.00	955.60	99.7	70 - 130
D 65 13C2_8:2 FTS_2	286368	262214			91.6	50 - 150
10 PFDA			1000.00	1118.28	111.8	70 - 130
D 51 13C6_PFDA	988943	769313			77.8	50 - 150
D 58 d3-MeFOSAA	1304722	1185599			90.9	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1053.91	105.4	70 - 130
9 PFDS			964.00	950.78	98.6	70 - 130
25 PFUdA			1000.00	882.52	88.3	70 - 130
D 60 d5-EtFOSAA	1171880	985770			84.1	50 - 150
D 52 13C7_PFUdA	820462	884754			107.8	50 - 150
5 N-EtFOSAA			1000.00	1222.19	122.2	70 - 130
D 61 d7-MeFOSE	147736	142385			96.4	50 - 150
32 MeFOSE			1000.00	1121.22	112.1	70 - 130
26 MeFOSA			1000.00	989.56	99	70 - 130
D 57 d3-MeFOSA	85068	64849			76.2	50 - 150
31 11Cl-PF3OUDS			942.00	808.25	85.8	70 - 130
D 62 d9-EtFOSE	149942	134568			89.7	50 - 150
33 EtFOSE			1000.00	1018.46	101.8	70 - 130
D 59 d5-EtFOSA	61503	59816			97.3	50 - 150
27 EtFOSA			1000.00	925.04	92.5	70 - 130
D 38 13C2_PFDoA	898934	844494			93.9	50 - 150
11 PFDoA			1000.00	959.02	95.9	70 - 130
4 10:2 FTS			964.00	877.92	91.1	70 - 130
34 PFDOS			968.00	856.20	88.5	70 - 130
24 PFTrDA			1000.00	841.13	84.1	70 - 130
23 PFTeDA			1000.00	1013.76	101.4	70 - 130
D 42 13C2_PFTeDA	977593	940482			96.2	50 - 150
35 PFHxDA			1000.00	1151.02	115.1	70 - 130
D 40 13C2_PFHxDA	482998	361804			74.9	50 - 150
36 PFODA			1000.00	1008.22	100.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321051.d
Injection Date: 03-Aug-2021 17:18:53 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 37
Sample Info: CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1134721			95.7	50 - 150
8 PFBA			1000.00	890.12	89	70 - 130
D 50 13C5_PFPeA	1263824	1159723			91.8	50 - 150
21 PFPeA			1000.00	910.96	91.1	70 - 130
7 PFBS			884.00	760.67	86	70 - 130
D 44 13C3_PFBS	312372	318550			102	50 - 150
1 4:2 FTS			934.00	1206.74	129.2	70 - 130
D 63 13C2_4:2 FTS_2	369798	320627			86.7	50 - 150
D 49 13C5_PFHxA	1074983	1006652			93.6	50 - 150
15 PFHxA			1000.00	873.37	87.3	70 - 130
22 PFPeS			938.00	905.59	96.5	70 - 130
28 GenX			2000.00	2330.15	116.5	70 - 130
D 66 13C3_GenX	701708	634755			90.5	50 - 150
D 47 13C4_PFHpA	1078744	887643			82.3	50 - 150
13 PFHpA			1000.00	921.36	92.1	70 - 130
D 45 13C3_PFHxS	306958	274210			89.3	50 - 150
14 PFHxS			910.00	859.73	94.5	70 - 130
29 ADONA			942.00	1004.71	106.7	70 - 130
D 64 13C2_6:2 FTS_2	297562	257546			86.6	50 - 150
2 6:2 FTS			948.00	1177.40	124.2	70 - 130
20 PFOA			1000.00	861.39	86.1	70 - 130
D 53 13C8_PFOA	1021364	957299			93.7	50 - 150
12 PFHpS			952.00	857.62	90.1	70 - 130
D 54 13C8_PFOS	258986	245946			95	50 - 150
18 PFOS			928.00	759.07	81.8	70 - 130
17 PFNA			1000.00	1055.74	105.6	70 - 130
D 56 13C9_PFNA	1016403	970674			95.5	50 - 150
30 9Cl-PF3ONS			932.00	838.87	90	70 - 130
D 55 13C8_PFOSA	491853	412102			83.8	50 - 150
19 PFOSA			1000.00	1033.58	103.4	70 - 130
16 PFNS			960.00	806.16	84	70 - 130
3 8:2 FTS			958.00	966.38	100.9	70 - 130
D 65 13C2_8:2 FTS_2	286368	258704			90.3	50 - 150
10 PFDA			1000.00	932.12	93.2	70 - 130
D 51 13C6_PFDA	988943	881524			89.1	50 - 150
D 58 d3-MeFOSAA	1304722	1116152			85.5	50 - 150

NO SAMPLES ASSOCIATED

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1063.62	106.4	70 - 130
9 PFDS			964.00	762.17	79.1	70 - 130
25 PFUdA			1000.00	990.16	99	70 - 130
D 60 d5-EtFOSAA	1171880	1023644			87.4	50 - 150
D 52 13C7_PFUdA	820462	724513			88.3	50 - 150
5 N-EtFOSAA			1000.00	1003.41	100.3	70 - 130
D 61 d7-MeFOSE	147736	128865			87.2	50 - 150
32 MeFOSE			1000.00	1062.94	106.3	70 - 130
26 MeFOSA			1000.00	1118.20	111.8	70 - 130
D 57 d3-MeFOSA	85068	54784			64.4	50 - 150
31 11Cl-PF3OUDS			942.00	732.10	77.7	70 - 130
D 62 d9-EtFOSE	149942	126317			84.2	50 - 150
33 EtFOSE			1000.00	991.11	99.1	70 - 130
D 59 d5-EtFOSA	61503	58224			94.7	50 - 150
27 EtFOSA			1000.00	1098.63	109.9	70 - 130
D 38 13C2_PFDoA	898934	763926			85	50 - 150
11 PFDoA			1000.00	945.38	94.5	70 - 130
4 10:2 FTS			964.00	894.51	92.8	70 - 130
34 PFDOS			968.00	812.76	84	70 - 130
24 PFTrDA			1000.00	913.73	91.4	70 - 130
23 PFTeDA			1000.00	922.45	92.2	70 - 130
D 42 13C2_PFTeDA	977593	921705			94.3	50 - 150
35 PFHxDA			1000.00	1015.84	101.6	70 - 130
D 40 13C2_PFHxDA	482998	373716			77.4	50 - 150
36 PFODA			1000.00	870.90	87.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321062.d
Injection Date: 03-Aug-2021 19:15:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 47
Sample Info: CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1277954			107.8	50 - 150
8 PFBA			1000.00	887.50	88.8	70 - 130
D 50 13C5_PFPeA	1263824	1378425			109.1	50 - 150
21 PFPeA			1000.00	810.31	81	70 - 130
7 PFBS			884.00	837.36	94.7	70 - 130
D 44 13C3_PFBS	312372	347251			111.2	50 - 150
1 4:2 FTS			934.00	987.54	105.7	70 - 130
D 63 13C2_4:2 FTS_2	369798	354000			95.7	50 - 150
D 49 13C5_PFHxA	1074983	1048870			97.6	50 - 150
15 PFHxA			1000.00	1013.40	101.3	70 - 130
22 PFPeS			938.00	879.94	93.8	70 - 130
28 GenX			2000.00	2450.52	122.5	70 - 130
D 66 13C3_GenX	701708	715702			102	50 - 150
D 47 13C4_PFHpA	1078744	1157994			107.3	50 - 150
13 PFHpA			1000.00	796.74	79.7	70 - 130
D 45 13C3_PFHxS	306958	304029			99	50 - 150
14 PFHxS			910.00	850.55	93.5	70 - 130
29 ADONA			942.00	949.42	100.8	70 - 130
D 64 13C2_6:2 FTS_2	297562	306090			102.9	50 - 150
2 6:2 FTS			948.00	1307.08	137.9	70 - 130
20 PFOA			1000.00	972.43	97.2	70 - 130
D 53 13C8_PFOA	1021364	1130229			110.7	50 - 150
12 PFHpS			952.00	907.01	95.3	70 - 130
D 54 13C8_PFOS	258986	263883			101.9	50 - 150
18 PFOS			928.00	894.92	96.4	70 - 130
17 PFNA			1000.00	894.19	89.4	70 - 130
D 56 13C9_PFNA	1016403	1163592			114.5	50 - 150
30 9Cl-PF3ONS			932.00	858.72	92.1	70 - 130
D 55 13C8_PFOSA	491853	435903			88.6	50 - 150
19 PFOSA			1000.00	1126.12	112.6	70 - 130
16 PFNS			960.00	946.29	98.6	70 - 130
3 8:2 FTS			958.00	833.13	87	70 - 130
D 65 13C2_8:2 FTS_2	286368	300413			104.9	50 - 150
10 PFDA			1000.00	780.24	78	70 - 130
D 51 13C6_PFDA	988943	1093785			110.6	50 - 150
D 58 d3-MeFOSAA	1304722	1242374			95.2	50 - 150

NO SAMPLES ASSOCIATED

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1060.13	106	70 - 130
9 PFDS			964.00	947.57	98.3	70 - 130
25 PFUdA			1000.00	1046.88	104.7	70 - 130
D 60 d5-EtFOSAA	1171880	1159668			99	50 - 150
D 52 13C7_PFUdA	820462	809101			98.6	50 - 150
5 N-EtFOSAA			1000.00	1008.54	100.9	70 - 130
D 61 d7-MeFOSE	147736	152693			103.4	50 - 150
32 MeFOSE			1000.00	1026.33	102.6	70 - 130
26 MeFOSA			1000.00	1202.27	120.2	70 - 130
D 57 d3-MeFOSA	85068	59014			69.4	50 - 150
31 11Cl-PF3OUDS			942.00	879.57	93.4	70 - 130
D 62 d9-EtFOSE	149942	147986			98.7	50 - 150
33 EtFOSE			1000.00	992.81	99.3	70 - 130
D 59 d5-EtFOSA	61503	65784			107	50 - 150
27 EtFOSA			1000.00	924.61	92.5	70 - 130
D 38 13C2_PFDoA	898934	892406			99.3	50 - 150
11 PFDoA			1000.00	909.18	90.9	70 - 130
4 10:2 FTS			964.00	914.27	94.8	70 - 130
34 PFDOS			968.00	852.13	88	70 - 130
24 PFTrDA			1000.00	894.25	89.4	70 - 130
23 PFTeDA			1000.00	917.83	91.8	70 - 130
D 42 13C2_PFTeDA	977593	1087540			111.2	50 - 150
35 PFHxDA			1000.00	1005.17	100.5	70 - 130
D 40 13C2_PFHxDA	482998	420924			87.1	50 - 150
36 PFODA			1000.00	879.65	88	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321069.d
Injection Date: 03-Aug-2021 20:30:07 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 53
Sample Info: CCV 1000D_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1294282			109.2	50 - 150
8 PFBA			1000.00	907.81	90.8	70 - 130
D 50 13C5_PFPeA	1263824	1251074			99	50 - 150
21 PFPeA			1000.00	893.38	89.3	70 - 130
7 PFBS			884.00	759.58	85.9	70 - 130
D 44 13C3_PFBS	312372	376863			120.6	50 - 150
1 4:2 FTS			934.00	1017.42	108.9	70 - 130
D 63 13C2_4:2 FTS_2	369798	362289			98	50 - 150
D 49 13C5_PFHxA	1074983	1158723			107.8	50 - 150
15 PFHxA			1000.00	867.21	86.7	70 - 130
22 PFPeS			938.00	848.88	90.5	70 - 130
28 GenX			2000.00	2453.01	122.7	70 - 130
D 66 13C3_GenX	701708	699740			99.7	50 - 150
D 47 13C4_PFHpA	1078744	1174986			108.9	50 - 150
13 PFHpA			1000.00	769.52	77	70 - 130
D 45 13C3_PFHxS	306958	319755			104.2	50 - 150
14 PFHxS			910.00	872.28	95.9	70 - 130
29 ADONA			942.00	1010.90	107.3	70 - 130
D 64 13C2_6:2 FTS_2	297562	294436			98.9	50 - 150
2 6:2 FTS			948.00	1477.02	155.8	70 - 130
20 PFOA			1000.00	909.51	91	70 - 130
D 53 13C8_PFOA	1021364	1122898			109.9	50 - 150
12 PFHpS			952.00	880.73	92.5	70 - 130
D 54 13C8_PFOS	258986	279538			107.9	50 - 150
18 PFOS			928.00	860.73	92.8	70 - 130
17 PFNA			1000.00	859.10	85.9	70 - 130
D 56 13C9_PFNA	1016403	1139426			112.1	50 - 150
30 9Cl-PF3ONS			932.00	827.59	88.8	70 - 130
D 55 13C8_PFOSA	491853	498027			101.3	50 - 150
19 PFOSA			1000.00	1050.96	105.1	70 - 130
16 PFNS			960.00	892.57	93	70 - 130
3 8:2 FTS			958.00	832.82	86.9	70 - 130
D 65 13C2_8:2 FTS_2	286368	316980			110.7	50 - 150
10 PFDA			1000.00	862.61	86.3	70 - 130
D 51 13C6_PFDA	988943	1057240			106.9	50 - 150
D 58 d3-MeFOSAA	1304722	1246819			95.6	50 - 150

NO SAMPLES ASSOCIATED

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1013.40	101.3	70 - 130
9 PFDS			964.00	974.80	101.1	70 - 130
25 PFUdA			1000.00	978.06	97.8	70 - 130
D 60 d5-EtFOSAA	1171880	1133052			96.7	50 - 150
D 52 13C7_PFUdA	820462	867849			105.8	50 - 150
5 N-EtFOSAA			1000.00	1029.86	103	70 - 130
D 61 d7-MeFOSE	147736	144237			97.6	50 - 150
32 MeFOSE			1000.00	1085.00	108.5	70 - 130
26 MeFOSA			1000.00	1022.74	102.3	70 - 130
D 57 d3-MeFOSA	85068	70675			83.1	50 - 150
31 11Cl-PF3OUDS			942.00	791.23	84	70 - 130
D 62 d9-EtFOSE	149942	140200			93.5	50 - 150
33 EtFOSE			1000.00	1070.63	107.1	70 - 130
D 59 d5-EtFOSA	61503	65540			106.6	50 - 150
27 EtFOSA			1000.00	1070.61	107.1	70 - 130
D 38 13C2_PFDoA	898934	879715			97.9	50 - 150
11 PFDoA			1000.00	913.79	91.4	70 - 130
4 10:2 FTS			964.00	790.57	82	70 - 130
34 PFDOS			968.00	789.86	81.6	70 - 130
24 PFTrDA			1000.00	921.33	92.1	70 - 130
23 PFTeDA			1000.00	934.16	93.4	70 - 130
D 42 13C2_PFTeDA	977593	1043230			106.7	50 - 150
35 PFHxDA			1000.00	1079.53	108	70 - 130
D 40 13C2_PFHxDA	482998	432419			89.5	50 - 150
36 PFODA			1000.00	921.35	92.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\080321-DOD.b\080321070.d
Injection Date: 03-Aug-2021 20:40:42 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 100
Sample Info: CCB C5 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1185130	1314377			110.9	50 - 150
8 PFBA			1000.00	1.5037	0.2	70 - 130
D 50 13C5_PFPeA	1263824	1286500			101.8	50 - 150
21 PFPeA						
7 PFBS						
D 44 13C3_PFBS	312372	363925			116.5	50 - 150
1 4:2 FTS						
D 63 13C2_4:2 FTS_2	369798	404597			109.4	50 - 150
D 49 13C5_PFHxA	1074983	1054982			98.1	50 - 150
15 PFHxA						
22 PFPeS						
28 GenX						
D 66 13C3_GenX	701708	842222			120	50 - 150
D 47 13C4_PFHpA	1078744	1163960			107.9	50 - 150
13 PFHpA						
D 45 13C3_PFHxS	306958	303947			99	50 - 150
14 PFHxS						
29 ADONA						
D 64 13C2_6:2 FTS_2	297562	323758			108.8	50 - 150
2 6:2 FTS						
20 PFOA						
D 53 13C8_PFOA	1021364	1196562			117.2	50 - 150
12 PFHpS						
D 54 13C8_PFOS	258986	277378			107.1	50 - 150
18 PFOS			928.00	3.5848	0.4	70 - 130
17 PFNA						
D 56 13C9_PFNA	1016403	1055421			103.8	50 - 150
30 9Cl-PF3ONS			932.00	0.14974	0	70 - 130
D 55 13C8_PFOSA	491853	531132			108	50 - 150
19 PFOSA						
16 PFNS						
3 8:2 FTS						
D 65 13C2_8:2 FTS_2	286368	341091			119.1	50 - 150
10 PFDA						
D 51 13C6_PFDA	988943	917131			92.7	50 - 150
D 58 d3-MeFOSAA	1304722	1411098			108.2	50 - 150

NO SAMPLES ASSOCIATED

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1.9409	0.2	70 - 130
9 PFDS						
25 PFUdA						
D 60 d5-EtFOSAA	1171880	1350815			115.3	50 - 150
D 52 13C7_PFUdA	820462	833578			101.6	50 - 150
5 N-EtFOSAA						
D 61 d7-MeFOSE	147736	163887			110.9	50 - 150
32 MeFOSE			1000.00	7.3817	0.7	70 - 130
26 MeFOSA						
D 57 d3-MeFOSA	85068	71466			84	50 - 150
31 11Cl-PF3OUDS			942.00	0.56361	0.1	70 - 130
D 62 d9-EtFOSE	149942	162179			108.2	50 - 150
33 EtFOSE						
D 59 d5-EtFOSA	61503	69613			113.2	50 - 150
27 EtFOSA						
D 38 13C2_PFDoA	898934	867325			96.5	50 - 150
11 PFDoA						
4 10:2 FTS						
34 PFDOS						
24 PFTrDA						
23 PFTeDA						
D 42 13C2_PFTeDA	977593	1089646			111.5	50 - 150
35 PFHxDA			1000.00	10.141	1	70 - 130
D 40 13C2_PFHxDA	482998	559339			115.8	50 - 150
36 PFODA						

Report Date: 04-Aug-2021 17:53:52 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\080321-DOD.b PFPeS ONLY

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	03-Aug-2021 12:56:26	080321005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	03-Aug-2021 13:07:03	080321006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	03-Aug-2021 13:17:37	080321007.d	InstBlk					Surrogates	Smp	0.1100		
1	WG30020-005	03-Aug-2021 13:28:15	080321008.d	Client	AFFF01-SB28-02-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
2	WG30020-006	03-Aug-2021 13:38:51	080321009.d	Client	AFFF01-SB28-17-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
3	WG30020-007	03-Aug-2021 13:49:30	080321010.d	Client	AFFF01-SB28-05-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
4	WG30020-008	03-Aug-2021 14:00:10	080321011.d	Client	AFFF01-SB25-02-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
5	WG30020-009	03-Aug-2021 14:10:48	080321012.d	Client	AFFF01-SB25-10-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
6	WG30020-010	03-Aug-2021 14:21:26	080321013.d	Client	AFFF01-SB25-07-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
7	WG30020-011	03-Aug-2021 14:32:02	080321014.d	Client	AFFF01-SB13-01-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
8	WG30020-012	03-Aug-2021 14:42:44	080321015.d	Client	AFFF01-SB13-18-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
9	WG30020-013	03-Aug-2021 14:53:22	080321016.d	Client	AFFF01-SB13-12-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		
10	WG30006-009	03-Aug-2021 15:04:02	080321017.d	Client	AFFF21-GW03-15-072921-00	Aqueous	10	10648	Surrogates	Smp	0.1100		
11	ID SUR 100PPB_SVLC-1591	03-Aug-2021 15:14:43	080321018.d	Client		Aqueous	1		Surrogates	Smp	0.1100		
12	ID CCV 1000_SVLC-1573	03-Aug-2021 15:25:18	080321019.d	CCV					Analytes	L-5	1.00		
13	CCB 1	03-Aug-2021 15:35:53	080321020.d	InstBlk					Surrogates	Smp	0.1100		
14	WG29007-014	03-Aug-2021 15:46:27	080321021.d	Client	AFFF21-SB01-12-072821-01	Soil	1	10561	Surrogates	Smp	0.1100		
15	WG29007-015	03-Aug-2021 15:57:04	080321022.d	Client	AFFF21-SB01-18-072821-00	Soil	1	10561	Surrogates	Smp	0.1100		
16	WG29007-016	03-Aug-2021 16:07:43	080321023.d	Client	AFFF21-SB01-22-072821-00	Soil	1	10561	Surrogates	Smp	0.1100		
17	WG29009-001	03-Aug-2021 16:18:20	080321024.d	Client	AFFF01-SW01-072821-00-T2	Aqueous	1	10648	Surrogates	Smp	0.1100		
18	WG29009-001MS	03-Aug-2021 16:28:55	080321025.d	MS		Aqueous	1	10648	Analytes	100x PDS	0.2000		
19	WG29009-001MD	03-Aug-2021 16:39:32	080321026.d	MSD		Aqueous	1	10648	Analytes	100x PDS	0.2000		
20	ID IBLK B	03-Aug-2021 16:50:12	080321027.d	InstBlk					Surrogates	Smp	0.1100		
21	WG20004-020	03-Aug-2021 17:00:52	080321028.d	Client	AOPC5-14D12A-071621	Aqueous	1	10648	Surrogates	Smp	0.1100		
22	WG20004-021	03-Aug-2021 17:11:28	080321029.d	Client	AOPC5-14D12A-071621-FD	Aqueous	1	10648	Surrogates	Smp	0.1100		
23	WG22011-001	03-Aug-2021 17:22:04	080321030.d	Client	AOPC24-W89-1-071921	Aqueous	1	10648	Surrogates	Smp	0.1100		
24	WG22011-002	03-Aug-2021 17:32:42	080321031.d	Client	AOPC3-W7-3-071921	Aqueous	1	10648	Surrogates	Smp	0.1100		
25	WG29009-002	03-Aug-2021 17:43:17	080321032.d	Client	AFFF01-SW01-072821-01-T2	Aqueous	1	10559	Surrogates	Smp	0.1100		SUR: UdA(low),DoA(low),TeDA(low),RX
26	WG29009-003	03-Aug-2021 17:53:54	080321033.d	Client	AFFF01-SW02-072821-01-T2	Aqueous	1	10559	Surrogates	Smp	0.1100		
27	ID CCV 1000A_SVLC-1573	03-Aug-2021 18:04:35	080321034.d	CCV					Analytes	L-5	1.00		
28	CCB 2	03-Aug-2021 18:15:17	080321035.d	InstBlk					Surrogates	Smp	0.1100		
29	WG30020-005	03-Aug-2021 18:25:56	080321036.d	Client	AFFF01-SB28-02-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
30	WG30020-006	03-Aug-2021 18:36:35	080321037.d	Client	AFFF01-SB28-17-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
31	WG30020-007	03-Aug-2021 18:47:17	080321038.d	Client	AFFF01-SB28-05-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
32	WG30020-008	03-Aug-2021 18:57:52	080321039.d	Client	AFFF01-SB25-02-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
33	WG30020-009	03-Aug-2021 19:08:26	080321040.d	Client	AFFF01-SB25-10-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
34	WG30020-010	03-Aug-2021 19:19:02	080321041.d	Client	AFFF01-SB25-07-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
35	WG30020-011	03-Aug-2021 19:29:40	080321042.d	Client	AFFF01-SB13-01-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		RR-5X
36	WG30020-012	03-Aug-2021 19:40:19	080321043.d	Client	AFFF01-SB13-18-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
37	WG30020-013	03-Aug-2021 19:50:57	080321044.d	Client	AFFF01-SB13-12-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
38	WG29007-003	03-Aug-2021 20:01:39	080321045.d	Client	AFFF21-SB13-12-0728210-0	Soil	1	10645	Surrogates	Smp	0.1100		
39	WG29007-003MS	03-Aug-2021 20:12:18	080321046.d	MS		Soil	1	10645	Analytes	100x PDS	0.1000		
40	WG29007-003MD	03-Aug-2021 20:23:01	080321047.d	MSD		Soil	1	10645	Analytes	100x PDS	0.1000		
41	ID CCV 1000B_SVLC-1573	03-Aug-2021 20:33:44	080321048.d	CCV					Analytes	L-5	1.00		

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
42	CCB 3	03-Aug-2021 20:44:22	080321049.d	InstBlk					Surrogates	Smp	0.1100		
43	WQ10883-001	03-Aug-2021 20:54:58	080321050.d	MBlk		Soil	1	10883	Surrogates	Smp	0.1100		
44	WQ10883-101	03-Aug-2021 21:05:39	080321051.d	MBlk		Soil	1	10883	Surrogates	Smp	0.1100		
45	WQ10883-002	03-Aug-2021 21:16:19	080321052.d	LCS		Soil	1	10883	Analytes	100x PDS	0.1000		
46	WQ10883-102	03-Aug-2021 21:26:56	080321053.d	LCS		Soil	1	10883	Analytes	100x PDS	0.1000		
47	WG29024-001	03-Aug-2021 21:37:36	080321054.d	Client	PFAS in Soil	Soil	1	10561	Surrogates	Smp	0.1100		
48	ID IBLK D	03-Aug-2021 21:48:19	080321055.d	InstBlk					Surrogates	Smp	0.1100		
49	WQ10747-001	03-Aug-2021 21:58:57	080321056.d	MBlk		Aqueous	1	10747	Surrogates	Smp	0.1100		
50	WQ10747-002	03-Aug-2021 22:09:37	080321057.d	LCS		Aqueous	1	10747	Analytes	100x PDS	0.2000		
51	WG30020-014	03-Aug-2021 22:20:17	080321058.d	Client	AFFF01-RB-01-072921-T1	Aqueous	1	10747	Surrogates	Smp	0.1100		
52	WG30020-015	03-Aug-2021 22:30:52	080321059.d	Client	AFFF01-RB-01-072921-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		
53	WG30020-016	03-Aug-2021 22:41:27	080321060.d	Client	AFFF01-FRB-01-072921-T1	Aqueous	1	10747	Surrogates	Smp	0.1100		
54	WG30051-001	03-Aug-2021 22:52:04	080321061.d	Client	AFFF21-FRB-03-072921-T4	Aqueous	1	10747	Surrogates	Smp	0.1100		
55	WG30051-002	03-Aug-2021 23:02:44	080321062.d	Client	AFFF21-RB-02-072921-T4	Aqueous	1	10747	Surrogates	Smp	0.1100		
56	ID CCV 1000C_SVLC-1573	03-Aug-2021 23:13:28	080321063.d	CCV					Analytes	L-5	1.00		
48	ID IBLK E	03-Aug-2021 23:24:10	080321064.d	InstBlk					Surrogates	Smp	0.1100		
57	ID SUR 100ppb_SVLC-1591	03-Aug-2021 23:34:47	080321065.d	Client		Aqueous	1		Surrogates	Smp	0.1100		CLEAN, GOOD TO USE
58	WG30020-002	03-Aug-2021 23:45:36	080321066.d	Client	AFFF01-SW03-072921-00-T2	Aqueous	50	10747	Surrogates	Smp	0.1100		RR-5X
59	WG30020-003	03-Aug-2021 23:56:17	080321067.d	Client	AFFF01-SW04-072921-00-T2	Aqueous	50	10747	Surrogates	Smp	0.1100		RR-1X
60	WG30020-004	04-Aug-2021 00:06:57	080321068.d	Client	AFFF01-SW05-072921-00-T2	Aqueous	50	10747	Surrogates	Smp	0.1100		RR-1X
61	WG24008-001	04-Aug-2021 00:17:39	080321069.d	Client	AOPC20-SW01-EF-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
62	WG24008-002	04-Aug-2021 00:28:19	080321070.d	Client	AOPC13-SW01-IN-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-50X
63	WG24008-003	04-Aug-2021 00:38:57	080321071.d	Client	AOPC13-SW01-EF-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
64	WG24008-004	04-Aug-2021 00:49:36	080321072.d	Client	AOPC13-SW01-EF-072221-FD	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
65	WG24008-005	04-Aug-2021 01:00:17	080321073.d	Client	AOPC15-SW01-EF-072321	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
66	WG24008-006	04-Aug-2021 01:10:55	080321074.d	Client	AOPC15-SW01-IN-072321	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
67	WG24009-007	04-Aug-2021 01:21:36	080321075.d	Client	AOPC1,6,7-14C60A-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-10X
68	WG24009-008	04-Aug-2021 01:32:18	080321076.d	Client	FB-12-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
69	WG24009-009	04-Aug-2021 01:42:59	080321077.d	Client	AOPC17,21-EXW-4-072321	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
70	WG24009-010	04-Aug-2021 01:53:41	080321078.d	Client	AOPC18-A-072321	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-1X
71	WG24009-011	04-Aug-2021 02:04:23	080321079.d	Client	FB-13-072321	Aqueous	50	10417	Surrogates	Smp	0.1100		

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080321-DOD.b\080321005.d
Injection Date: 03-Aug-2021 12:56:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	632053			112.3	50 - 150
8 PFBA			100.00	105.68	105.7	70 - 130
D 50 13C5_PFPeA	523546	587380			112.2	50 - 150
21 PFPeA			100.00	95.804	95.8	70 - 130
7 PFBS			88.400	84.803	95.9	70 - 130
D 44 13C3_PFBS	169277	185561			109.6	50 - 150
D 63 13C2_4:2 FTS_2	90196	117580			130.4	50 - 150
1 4:2 FTS			93.400	116.97	125.2	70 - 130
D 49 13C5_PFHxA	600114	681320			113.5	50 - 150
15 PFHxA			100.00	100.13	100.1	70 - 130
22 PFPeS			93.800	88.966	94.8	70 - 130
28 GenX			200.00	203.42	101.7	70 - 130
D 66 13C3_GenX	1000599	1270258			126.9	50 - 150
D 47 13C4_PFHpA	482787	550029			113.9	50 - 150
13 PFHpA			100.00	88.840	88.8	70 - 130
D 45 13C3_PFHxS	137682	156336			113.5	50 - 150
14 PFHxS			91.000	94.634	104	70 - 130
29 ADONA			94.200	100.01	106.2	70 - 130
D 64 13C2_6:2 FTS_2	77321	98076			126.8	50 - 150
2 6:2 FTS			94.800	155.25	163.8	70 - 130
20 PFOA			100.00	107.97	108	70 - 130
D 53 13C8_PFOA	538966	508794			94.4	50 - 150
12 PFHpS			95.200	81.092	85.2	70 - 130
18 PFOS			92.800	76.380	82.3	70 - 130
D 54 13C8_PFOS	139992	144116			102.9	50 - 150
17 PFNA			100.00	104.32	104.3	70 - 130
D 56 13C9_PFNA	618881	681866			110.2	50 - 150
30 9Cl-PF3ONS			93.200	98.276	105.4	70 - 130
D 55 13C8_PFOSA	250019	296770			118.7	50 - 150
19 PFOSA			100.00	109.99	110	70 - 130
16 PFNS			96.000	100.98	105.2	70 - 130
D 65 13C2_8:2 FTS_2	72182	96550			133.8	50 - 150
10 PFDA			100.00	102.66	102.7	70 - 130
3 8:2 FTS			95.800	129.22	134.9	70 - 130
D 51 13C6_PFDA	590501	623361			105.6	50 - 150
D 58 d3-MeFOSAA	601725	758375			126	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	96.908	96.9	70 - 130
9 PFDS			96.400	105.48	109.4	70 - 130
D 52 13C7_PFUdA	707587	706573			99.9	50 - 150
25 PFUdA			100.00	105.62	105.6	70 - 130
D 60 d5-EtFOSAA	521292	690905			132.5	50 - 150
5 N-EtFOSAA			100.00	94.339	94.3	70 - 130
D 61 d7-MeFOSE	68295	92916			136.1	50 - 150
32 MeFOSE			100.00	94.972	95	70 - 130
D 57 d3-MeFOSA	40777	53005			130	50 - 150
26 MeFOSA			100.00	127.34	127.3	70 - 130
31 11Cl-PF3OUDS			94.200	100.61	106.8	70 - 130
D 62 d9-EtFOSE	68452	102346			149.5	50 - 150
33 EtFOSE			100.00	85.474	85.5	70 - 130
D 59 d5-EtFOSA	38025	49795			131	50 - 150
27 EtFOSA			100.00	96.226	96.2	70 - 130
11 PFDoA			100.00	101.17	101.2	70 - 130
D 38 13C2_PFDoA	745164	701120			94.1	50 - 150
4 10:2 FTS			96.400	60.608	62.9	70 - 130
34 PFDOS			96.800	112.04	115.7	70 - 130
24 PFTrDA			100.00	115.52	115.5	70 - 130
23 PFTeDA			100.00	101.81	101.8	70 - 130
D 42 13C2_PFTeDA	846373	980046			115.8	50 - 150
D 40 13C2_PFHxDA	768834	951974			123.8	50 - 150
35 PFHxDA			100.00	109.59	109.6	70 - 130
36 PFODA			100.00	106.59	106.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080321-DOD.b\080321006.d
Injection Date: 03-Aug-2021 13:07:03 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	632053	640443			101.3	50 - 150
8 PFBA			200.00	210.89	105.4	70 - 130
D 50 13C5_PFPeA	587380	587772			100.1	50 - 150
21 PFPeA			200.00	203.34	101.7	70 - 130
7 PFBS			176.80	185.05	104.7	70 - 130
D 44 13C3_PFBS	185561	185723			100.1	50 - 150
D 63 13C2_4:2 FTS_2	117580	113811			96.8	50 - 150
1 4:2 FTS			186.80	197.50	105.7	70 - 130
D 49 13C5_PFHxA	681320	700669			102.8	50 - 150
15 PFHxA			200.00	202.21	101.1	70 - 130
22 PFPeS			187.60	205.58	109.6	70 - 130
28 GenX			400.00	397.91	99.5	70 - 130
D 66 13C3_GenX	1270258	1306036			102.8	50 - 150
D 47 13C4_PFHpA	550029	545401			99.2	50 - 150
13 PFHpA			200.00	193.31	96.7	70 - 130
D 45 13C3_PFHxS	156336	156103			99.9	50 - 150
14 PFHxS			182.00	166.20	91.3	70 - 130
29 ADONA			188.40	198.27	105.2	70 - 130
D 64 13C2_6:2 FTS_2	98076	92013			93.8	50 - 150
2 6:2 FTS			189.60	208.56	110	70 - 130
20 PFOA			200.00	211.10	105.5	70 - 130
D 53 13C8_PFOA	508794	529684			104.1	50 - 150
12 PFHpS			190.40	202.16	106.2	70 - 130
18 PFOS			185.60	176.67	95.2	70 - 130
D 54 13C8_PFOS	144116	157733			109.4	50 - 150
17 PFNA			200.00	192.61	96.3	70 - 130
D 56 13C9_PFNA	681866	691210			101.4	50 - 150
30 9Cl-PF3ONS			186.40	176.82	94.9	70 - 130
D 55 13C8_PFOSA	296770	304030			102.4	50 - 150
19 PFOSA			200.00	194.85	97.4	70 - 130
16 PFNS			192.00	168.71	87.9	70 - 130
D 65 13C2_8:2 FTS_2	96550	113386			117.4	50 - 150
10 PFDA			200.00	200.47	100.2	70 - 130
3 8:2 FTS			191.60	192.67	100.6	70 - 130
D 51 13C6_PFDA	623361	650676			104.4	50 - 150
D 58 d3-MeFOSAA	758375	786825			103.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	187.95	94	70 - 130
9 PFDS			192.80	192.25	99.7	70 - 130
D 52 13C7_PFUdA	706573	684690			96.9	50 - 150
25 PFUdA			200.00	199.06	99.5	70 - 130
D 60 d5-EtFOSAA	690905	724477			104.9	50 - 150
5 N-EtFOSAA			200.00	235.22	117.6	70 - 130
D 61 d7-MeFOSE	92916	93683			100.8	50 - 150
32 MeFOSE			200.00	186.90	93.5	70 - 130
D 57 d3-MeFOSA	53005	52038			98.2	50 - 150
26 MeFOSA			200.00	241.11	120.6	70 - 130
31 11Cl-PF3OUDS			188.40	171.62	91.1	70 - 130
D 62 d9-EtFOSE	102346	101021			98.7	50 - 150
33 EtFOSE			200.00	212.17	106.1	70 - 130
D 59 d5-EtFOSA	49795	51447			103.3	50 - 150
27 EtFOSA			200.00	165.39	82.7	70 - 130
11 PFDoA			200.00	214.19	107.1	70 - 130
D 38 13C2_PFDoA	701120	677890			96.7	50 - 150
4 10:2 FTS			192.80	105.57	54.8	70 - 130
34 PFDOS			193.60	188.92	97.6	70 - 130
24 PFTrDA			200.00	229.57	114.8	70 - 130
23 PFTeDA			200.00	201.39	100.7	70 - 130
D 42 13C2_PFTeDA	980046	1038713			106	50 - 150
D 40 13C2_PFHxDA	951974	984398			103.4	50 - 150
35 PFHxDA			200.00	205.72	102.9	70 - 130
36 PFODA			200.00	205.28	102.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080321-DOD.b\080321019.d
Injection Date: 03-Aug-2021 15:25:18 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 12
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	632053	657389			104	50 - 150
8 PFBA			1000.00	919.81	92	70 - 130
D 50 13C5_PFPeA	587380	605002			103	50 - 150
21 PFPeA			1000.00	916.98	91.7	70 - 130
7 PFBS			884.00	792.78	89.7	70 - 130
D 44 13C3_PFBS	185561	191942			103.4	50 - 150
D 63 13C2_4:2 FTS_2	117580	109780			93.4	50 - 150
1 4:2 FTS			934.00	1031.70	110.5	70 - 130
D 49 13C5_PFHxA	681320	709787			104.2	50 - 150
15 PFHxA			1000.00	888.93	88.9	70 - 130
22 PFPeS			938.00	910.99	97.1	70 - 130
28 GenX			2000.00	1932.52	96.6	70 - 130
D 66 13C3_GenX	1270258	1176217			92.6	50 - 150
D 47 13C4_PFHpA	550029	558358			101.5	50 - 150
13 PFHpA			1000.00	932.69	93.3	70 - 130
D 45 13C3_PFHxS	156336	151434			96.9	50 - 150
14 PFHxS			910.00	851.26	93.5	70 - 130
29 ADONA			942.00	900.14	95.6	70 - 130
D 64 13C2_6:2 FTS_2	98076	90180			91.9	50 - 150
2 6:2 FTS			948.00	1075.22	113.4	70 - 130
20 PFOA			1000.00	944.28	94.4	70 - 130
D 53 13C8_PFOA	508794	529351			104	50 - 150
12 PFHpS			952.00	934.63	98.2	70 - 130
18 PFOS			928.00	782.51	84.3	70 - 130
D 54 13C8_PFOS	144116	173690			120.5	50 - 150
17 PFNA			1000.00	936.59	93.7	70 - 130
D 56 13C9_PFNA	681866	697694			102.3	50 - 150
30 9Cl-PF3ONS			932.00	764.71	82.1	70 - 130
D 55 13C8_PFOSA	296770	293174			98.8	50 - 150
19 PFOSA			1000.00	951.18	95.1	70 - 130
16 PFNS			960.00	790.88	82.4	70 - 130
D 65 13C2_8:2 FTS_2	96550	99869			103.4	50 - 150
10 PFDA			1000.00	954.37	95.4	70 - 130
3 8:2 FTS			958.00	942.69	98.4	70 - 130
D 51 13C6_PFDA	623361	645664			103.6	50 - 150
D 58 d3-MeFOSAA	758375	682674			90	50 - 150

Report Date: 04-Aug-2021 17:53:16 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\080321-DOD.b\080321019.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	938.55	93.9	70 - 130
9 PFDS			964.00	759.64	78.8	70 - 130
D 52 13C7_PFUdA	706573	683816			96.8	50 - 150
25 PFUdA			1000.00	963.90	96.4	70 - 130
D 60 d5-EtFOSAA	690905	634181			91.8	50 - 150
5 N-EtFOSAA			1000.00	1024.40	102.4	70 - 130
D 61 d7-MeFOSE	92916	80163			86.3	50 - 150
32 MeFOSE			1000.00	986.69	98.7	70 - 130
D 57 d3-MeFOSA	53005	55067			103.9	50 - 150
26 MeFOSA			1000.00	918.44	91.8	70 - 130
31 11Cl-PF3OUDS			942.00	757.20	80.4	70 - 130
D 62 d9-EtFOSE	102346	101286			99	50 - 150
33 EtFOSE			1000.00	884.17	88.4	70 - 130
D 59 d5-EtFOSA	49795	46573			93.5	50 - 150
27 EtFOSA			1000.00	1138.34	113.8	70 - 130
11 PFDoA			1000.00	920.96	92.1	70 - 130
D 38 13C2_PFDoA	701120	692059			98.7	50 - 150
4 10:2 FTS			964.00	594.47	61.7	70 - 130
34 PFDOS			968.00	793.71	82	70 - 130
24 PFTrDA			1000.00	1063.65	106.4	70 - 130
23 PFTeDA			1000.00	909.85	91	70 - 130
D 42 13C2_PFTeDA	980046	1065177			108.7	50 - 150
D 40 13C2_PFHxDA	951974	920520			96.7	50 - 150
35 PFHxDA			1000.00	1037.23	103.7	70 - 130
36 PFODA			1000.00	1007.19	100.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080321-DOD.b\080321034.d
Injection Date: 03-Aug-2021 18:04:35 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 27
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	632053	674672			106.7	50 - 150
8 PFBA			1000.00	921.34	92.1	70 - 130
D 50 13C5_PFPeA	587380	634283			108	50 - 150
21 PFPeA			1000.00	892.00	89.2	70 - 130
7 PFBS			884.00	817.69	92.5	70 - 130
D 44 13C3_PFBS	185561	198491			107	50 - 150
D 63 13C2_4:2 FTS_2	117580	108191			92	50 - 150
1 4:2 FTS			934.00	1042.66	111.6	70 - 130
D 49 13C5_PFHxA	681320	740393			108.7	50 - 150
15 PFHxA			1000.00	840.25	84	70 - 130
22 PFPeS			938.00	852.89	90.9	70 - 130
28 GenX			2000.00	1879.59	94	70 - 130
D 66 13C3_GenX	1270258	1228114			96.7	50 - 150
D 47 13C4_PFHpA	550029	583250			106	50 - 150
13 PFHpA			1000.00	891.17	89.1	70 - 130
D 45 13C3_PFHxS	156336	149915			95.9	50 - 150
14 PFHxS			910.00	906.97	99.7	70 - 130
29 ADONA			942.00	1011.50	107.4	70 - 130
D 64 13C2_6:2 FTS_2	98076	92647			94.5	50 - 150
2 6:2 FTS			948.00	1097.89	115.8	70 - 130
20 PFOA			1000.00	937.66	93.8	70 - 130
D 53 13C8_PFOA	508794	555132			109.1	50 - 150
12 PFHpS			952.00	926.53	97.3	70 - 130
18 PFOS			928.00	818.39	88.2	70 - 130
D 54 13C8_PFOS	144116	166469			115.5	50 - 150
17 PFNA			1000.00	887.33	88.7	70 - 130
D 56 13C9_PFNA	681866	729948			107.1	50 - 150
30 9Cl-PF3ONS			932.00	836.16	89.7	70 - 130
D 55 13C8_PFOSA	296770	311300			104.9	50 - 150
19 PFOSA			1000.00	914.13	91.4	70 - 130
16 PFNS			960.00	814.39	84.8	70 - 130
D 65 13C2_8:2 FTS_2	96550	101239			104.9	50 - 150
10 PFDA			1000.00	883.13	88.3	70 - 130
3 8:2 FTS			958.00	939.73	98.1	70 - 130
D 51 13C6_PFDA	623361	705129			113.1	50 - 150
D 58 d3-MeFOSAA	758375	708021			93.4	50 - 150

Report Date: 04-Aug-2021 17:53:25 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\080321-DOD.b\080321034.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1080.26	108	70 - 130
9 PFDS			964.00	848.44	88	70 - 130
D 52 13C7_PFUdA	706573	709861			100.5	50 - 150
25 PFUdA			1000.00	988.62	98.9	70 - 130
D 60 d5-EtFOSAA	690905	655469			94.9	50 - 150
5 N-EtFOSAA			1000.00	1003.02	100.3	70 - 130
D 61 d7-MeFOSE	92916	84808			91.3	50 - 150
32 MeFOSE			1000.00	988.68	98.9	70 - 130
D 57 d3-MeFOSA	53005	53889			101.7	50 - 150
26 MeFOSA			1000.00	1055.80	105.6	70 - 130
31 11Cl-PF3OUDS			942.00	820.43	87.1	70 - 130
D 62 d9-EtFOSE	102346	94890			92.7	50 - 150
33 EtFOSE			1000.00	1013.81	101.4	70 - 130
D 59 d5-EtFOSA	49795	49299			99	50 - 150
27 EtFOSA			1000.00	1024.21	102.4	70 - 130
11 PFDoA			1000.00	957.55	95.8	70 - 130
D 38 13C2_PFDoA	701120	691730			98.7	50 - 150
4 10:2 FTS			964.00	607.75	63	70 - 130
34 PFDOS			968.00	894.55	92.4	70 - 130
24 PFTrDA			1000.00	1116.99	111.7	70 - 130
23 PFTeDA			1000.00	904.53	90.5	70 - 130
D 42 13C2_PFTeDA	980046	1068761			109.1	50 - 150
D 40 13C2_PFHxDA	951974	945765			99.3	50 - 150
35 PFHxDA			1000.00	1057.69	105.8	70 - 130
36 PFODA			1000.00	1059.88	106	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080321-DOD.b\080321048.d
Injection Date: 03-Aug-2021 20:33:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 41
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	632053	672562			106.4	50 - 150
8 PFBA			1000.00	923.33	92.3	70 - 130
D 50 13C5_PFPeA	587380	642460			109.4	50 - 150
21 PFPeA			1000.00	938.20	93.8	70 - 130
7 PFBS			884.00	760.50	86	70 - 130
D 44 13C3_PFBS	185561	209813			113.1	50 - 150
D 63 13C2_4:2 FTS_2	117580	107634			91.5	50 - 150
1 4:2 FTS			934.00	1083.56	116	70 - 130
D 49 13C5_PFHxA	681320	751096			110.2	50 - 150
15 PFHxA			1000.00	831.50	83.2	70 - 130
22 PFPeS			938.00	827.86	88.3	70 - 130
28 GenX			2000.00	1873.31	93.7	70 - 130
D 66 13C3_GenX	1270258	1206697			95	50 - 150
D 47 13C4_PFHpA	550029	583307			106.1	50 - 150
13 PFHpA			1000.00	875.22	87.5	70 - 130
D 45 13C3_PFHxS	156336	164460			105.2	50 - 150
14 PFHxS			910.00	866.43	95.2	70 - 130
29 ADONA			942.00	862.79	91.6	70 - 130
D 64 13C2_6:2 FTS_2	98076	88209			89.9	50 - 150
2 6:2 FTS			948.00	1157.47	122.1	70 - 130
20 PFOA			1000.00	907.50	90.7	70 - 130
D 53 13C8_PFOA	508794	568583			111.8	50 - 150
12 PFHpS			952.00	904.71	95	70 - 130
18 PFOS			928.00	814.87	87.8	70 - 130
D 54 13C8_PFOS	144116	169192			117.4	50 - 150
17 PFNA			1000.00	896.52	89.7	70 - 130
D 56 13C9_PFNA	681866	732863			107.5	50 - 150
30 9Cl-PF3ONS			932.00	839.18	90	70 - 130
D 55 13C8_PFOSA	296770	314016			105.8	50 - 150
19 PFOSA			1000.00	966.41	96.6	70 - 130
16 PFNS			960.00	854.55	89	70 - 130
D 65 13C2_8:2 FTS_2	96550	106231			110	50 - 150
10 PFDA			1000.00	991.13	99.1	70 - 130
3 8:2 FTS			958.00	842.78	88	70 - 130
D 51 13C6_PFDA	623361	668998			107.3	50 - 150
D 58 d3-MeFOSAA	758375	734552			96.9	50 - 150

Report Date: 04-Aug-2021 17:53:35 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\080321-DOD.b\080321048.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1082.01	108.2	70 - 130
9 PFDS			964.00	912.96	94.7	70 - 130
D 52 13C7_PFUdA	706573	726412			102.8	50 - 150
25 PFUdA			1000.00	963.92	96.4	70 - 130
D 60 d5-EtFOSAA	690905	712363			103.1	50 - 150
5 N-EtFOSAA			1000.00	883.12	88.3	70 - 130
D 61 d7-MeFOSE	92916	92390			99.4	50 - 150
32 MeFOSE			1000.00	988.19	98.8	70 - 130
D 57 d3-MeFOSA	53005	59362			112	50 - 150
26 MeFOSA			1000.00	1019.69	102	70 - 130
31 11Cl-PF3OUDS			942.00	834.70	88.6	70 - 130
D 62 d9-EtFOSE	102346	107036			104.6	50 - 150
33 EtFOSE			1000.00	850.20	85	70 - 130
D 59 d5-EtFOSA	49795	49634			99.7	50 - 150
27 EtFOSA			1000.00	954.18	95.4	70 - 130
11 PFDoA			1000.00	912.66	91.3	70 - 130
D 38 13C2_PFDoA	701120	731980			104.4	50 - 150
4 10:2 FTS			964.00	628.92	65.2	70 - 130
34 PFDOS			968.00	890.84	92	70 - 130
24 PFTrDA			1000.00	1014.29	101.4	70 - 130
23 PFTeDA			1000.00	875.45	87.5	70 - 130
D 42 13C2_PFTeDA	980046	1092629			111.5	50 - 150
D 40 13C2_PFHxDA	951974	984544			103.4	50 - 150
35 PFHxDA			1000.00	1046.76	104.7	70 - 130
36 PFODA			1000.00	1012.96	101.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080321-DOD.b\080321063.d
Injection Date: 03-Aug-2021 23:13:28 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 56
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	632053	627600			99.3	50 - 150
8 PFBA			1000.00	948.24	94.8	70 - 130
D 50 13C5_PFPeA	587380	599635			102.1	50 - 150
21 PFPeA			1000.00	946.02	94.6	70 - 130
7 PFBS			884.00	827.67	93.6	70 - 130
D 44 13C3_PFBS	185561	190677			102.8	50 - 150
D 63 13C2_4:2 FTS_2	117580	102881			87.5	50 - 150
1 4:2 FTS			934.00	856.39	91.7	70 - 130
D 49 13C5_PFHxA	681320	699441			102.7	50 - 150
15 PFHxA			1000.00	965.13	96.5	70 - 130
22 PFPeS			938.00	799.11	85.2	70 - 130
28 GenX			2000.00	1960.98	98	70 - 130
D 66 13C3_GenX	1270258	1136387			89.5	50 - 150
D 47 13C4_PFHpA	550029	530486			96.4	50 - 150
13 PFHpA			1000.00	952.90	95.3	70 - 130
D 45 13C3_PFHxS	156336	164889			105.5	50 - 150
14 PFHxS			910.00	782.43	86	70 - 130
29 ADONA			942.00	865.86	91.9	70 - 130
D 64 13C2_6:2 FTS_2	98076	88782			90.5	50 - 150
2 6:2 FTS			948.00	1066.63	112.5	70 - 130
20 PFOA			1000.00	964.02	96.4	70 - 130
D 53 13C8_PFOA	508794	534739			105.1	50 - 150
12 PFHpS			952.00	830.61	87.2	70 - 130
18 PFOS			928.00	807.87	87.1	70 - 130
D 54 13C8_PFOS	144116	154830			107.4	50 - 150
17 PFNA			1000.00	951.20	95.1	70 - 130
D 56 13C9_PFNA	681866	666995			97.8	50 - 150
30 9Cl-PF3ONS			932.00	864.07	92.7	70 - 130
D 55 13C8_PFOSA	296770	286739			96.6	50 - 150
19 PFOSA			1000.00	1023.42	102.3	70 - 130
16 PFNS			960.00	860.29	89.6	70 - 130
D 65 13C2_8:2 FTS_2	96550	96817			100.3	50 - 150
10 PFDA			1000.00	920.98	92.1	70 - 130
3 8:2 FTS			958.00	874.99	91.3	70 - 130
D 51 13C6_PFDA	623361	645883			103.6	50 - 150
D 58 d3-MeFOSAA	758375	719488			94.9	50 - 150

Report Date: 04-Aug-2021 17:53:43 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\II\LCMSMS02.i\080321-DOD.b\080321063.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1008.79	100.9	70 - 130
9 PFDS			964.00	927.54	96.2	70 - 130
D 52 13C7_PFUdA	706573	709101			100.4	50 - 150
25 PFUdA			1000.00	914.78	91.5	70 - 130
D 60 d5-EtFOSAA	690905	720363			104.3	50 - 150
5 N-EtFOSAA			1000.00	895.13	89.5	70 - 130
D 61 d7-MeFOSE	92916	87953			94.7	50 - 150
32 MeFOSE			1000.00	955.77	95.6	70 - 130
D 57 d3-MeFOSA	53005	54494			102.8	50 - 150
26 MeFOSA			1000.00	1078.67	107.9	70 - 130
31 11Cl-PF3OUDS			942.00	865.20	91.8	70 - 130
D 62 d9-EtFOSE	102346	98330			96.1	50 - 150
33 EtFOSE			1000.00	988.04	98.8	70 - 130
D 59 d5-EtFOSA	49795	45820			92	50 - 150
27 EtFOSA			1000.00	1048.75	104.9	70 - 130
11 PFDoA			1000.00	968.77	96.9	70 - 130
D 38 13C2_PFDoA	701120	662792			94.5	50 - 150
4 10:2 FTS			964.00	643.11	66.7	70 - 130
34 PFDOS			968.00	883.35	91.3	70 - 130
24 PFTrDA			1000.00	1063.66	106.4	70 - 130
23 PFTeDA			1000.00	912.84	91.3	70 - 130
D 42 13C2_PFTeDA	980046	1024873			104.6	50 - 150
D 40 13C2_PFHxDA	951974	918790			96.5	50 - 150
35 PFHxDA			1000.00	1076.57	107.7	70 - 130
36 PFODA			1000.00	1036.16	103.6	70 - 130

Report Date: 05-Aug-2021 13:49:45 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

NOT USED IN DATA PACKAGE

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11	080421A011.d	ICal					Analytes	L-1	1.00		
2	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42	080421A012.d	ICal					Analytes	L-2	1.00		
3	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14	080421A013.d	ICal					Analytes	L-3	1.00		
4	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48	080421A014.d	ICal					Analytes	L-4	1.00		
5	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20	080421A015.d	ICal					Analytes	L-5	1.00		
6	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54	080421A016.d	ICal					Analytes	L-6	1.00		
7	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27	080421A017.d	ICal					Analytes	L-7	1.00		
8	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03	080421A018.d	ICal					Analytes	L-8	1.00		
9	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39	080421A019.d	ICal					Analytes	L-9	1.00		
10	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16	080421A020.d	ICal					Analytes	L-10	1.00		
100	ID BLK C1	04-Aug-2021 16:23:55	080421A021.d	InstBlk					Surrogates	Smp	0.1100		
11	ICV 500_SVLC-1590	04-Aug-2021 16:34:36	080421A022.d	InstBlk					Surrogates	Smp	0.1100		RR-Misloaded
12	ISOMERS_SVLC-1562	04-Aug-2021 16:45:09	080421A023.d	CheckStd					Surrogates	Smp	1.00	Yes	RR-Misloaded
100	ID BLK C	04-Aug-2021 17:10:50	080421A025.d	InstBlk					Surrogates	Smp	0.1100		
11	ICV 500_SVLC-1590	04-Aug-2021 17:21:32	080421A026.d	ICV					Analytes	ICV	1.00		
12	ISOMERS_SVLC-1562	04-Aug-2021 17:32:04	080421A027.d	CheckStd					Surrogates	Smp	1.00	Yes	
13	ID IBLK A	04-Aug-2021 17:42:36	080421A028.d	InstBlk					Surrogates	Smp	0.1100		
14	WQ10675-002	04-Aug-2021 17:53:09	080421A029.d	LCS		Aqueous	1	10675	Analytes	100x PDS	0.2000		6:2 HIGH-NCM
15	WQ10452-001	04-Aug-2021 18:03:41	080421A030.d	MBlk		Aqueous	1	10452	Surrogates	Smp	0.1100		
16	WG22011-019	04-Aug-2021 18:14:15	080421A031.d	Client	AOPC10-WGC2-10-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		SUR CONFIRMS
17	WG31016-018	04-Aug-2021 18:24:49	080421A032.d	Client	AFFF21-GW29-22-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		
18	WG31016-019	04-Aug-2021 18:35:22	080421A033.d	Client	AFFF21-GW29-15-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		
19	WG31016-020	04-Aug-2021 18:45:56	080421A034.d	Client	AFFF21-GW01-23-073021-00	Aqueous	1	10710	Surrogates	Smp	0.1100		RX-6:2 SUR HIGH CONF-DETECT, SOME LOW-NCM MTX
20	WG31016-021	04-Aug-2021 18:56:33	080421A035.d	Client	AFFF21-GW01-15-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		
21	CCV 1000_SVLC-1600	04-Aug-2021 19:07:12	080421A036.d	CCV					Analytes	L-5	1.00		
100	CCB C1	04-Aug-2021 19:17:43	080421A037.d	InstBlk					Surrogates	Smp	0.1100		
22	WQ10798-002	04-Aug-2021 19:28:24	080421A038.d	LCS		Soil	1	10798	Analytes	100x PDS	0.1000		
23	WG31016-010	04-Aug-2021 19:38:56	080421A039.d	Client	AFFF21-SB05-00-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
24	WG31016-011	04-Aug-2021 19:49:31	080421A040.d	Client	AFFF21-SB05-07-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
25	WG31016-011MS	04-Aug-2021 20:00:04	080421A041.d	MS	AFFF21-SB05-07-073021-00	Soil	1	10798	Analytes	100x PDS	0.1000		
26	WG31016-011MD	04-Aug-2021 20:10:40	080421A042.d	MSD	AFFF21-SB05-07-073021-00	Soil	1	10798	Analytes	100x PDS	0.1000		
27	WG31016-012	04-Aug-2021 20:21:13	080421A043.d	Client	AFFF21-SB05-12-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
28	WG31016-013	04-Aug-2021 20:31:49	080421A044.d	Client	AFFF21-SB05-19-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
29	WG31016-014	04-Aug-2021 20:42:24	080421A045.d	Client	AFFF21-SB05-24-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
30	WG31016-015	04-Aug-2021 20:53:00	080421A046.d	Client	AFFF21-SB05-30-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
31	WG31020-016	04-Aug-2021 21:03:38	080421A047.d	Client	AFFF01-SB15-02-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		RR-5X
32	WG31020-017	04-Aug-2021 21:14:12	080421A048.d	Client	AFFF01-SB15-01-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		RR-10X
33	WG31020-018	04-Aug-2021 21:24:45	080421A049.d	Client	AFFF01-SB15-03-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		RR-1X-C/O
34	WG31020-019	04-Aug-2021 21:35:23	080421A050.d	Client	AFFF01-SB15-03-073021-01	Soil	1	10798	Surrogates	Smp	0.1100		
35	CCV 1000A_SVLC-1600	04-Aug-2021 21:45:57	080421A051.d	CCV					Analytes	L-5	1.00		
100	CCB C2	04-Aug-2021 21:56:32	080421A052.d	InstBlk					Surrogates	Smp	0.1100		
36	WG31020-020	04-Aug-2021 22:07:14	080421A053.d	Client	AFFF01-SB09-02-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
37	WG31020-021	04-Aug-2021 22:17:49	080421A054.d	Client	AFFF01-SB09-15-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
38	WG31020-022	04-Aug-2021 22:28:25	080421A055.d	Client	AFFF01-SB09-10-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		

Report Date: 05-Aug-2021 13:49:45 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
39	WG31020-023	04-Aug-2021 22:39:01	080421A056.d	Client	AFFF01-SB08-02-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
40	WG31020-024	04-Aug-2021 22:49:38	080421A057.d	Client	AFFF01-SB08-10-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
41	WG31020-025	04-Aug-2021 23:00:17	080421A058.d	Client	AFFF01-SB08-24-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
42	WG31020-026	04-Aug-2021 23:10:48	080421A059.d	Client	AFFF01-SB08-24-073021-01	Soil	1	10798	Surrogates	Smp	0.1100		
43	WG31020-027	04-Aug-2021 23:21:22	080421A060.d	Client	AFFF01-SB07-02-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
44	WG31020-028	04-Aug-2021 23:31:57	080421A061.d	Client	AFFF01-SB07-14-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
45	WG31020-029	04-Aug-2021 23:42:30	080421A062.d	Client	AFFF01-SB07-09-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
46	CCV 1000B_SVLC-1600	04-Aug-2021 23:53:07	080421A063.d	CCV					Analytes	L-5	1.00		
100	CCB C3	05-Aug-2021 00:03:41	080421A064.d	InstBlk					Surrogates	Smp	0.1100		
47	WG28008-004	05-Aug-2021 00:14:22	080421A065.d	Client	ASTC-VAP-13GW(22-25)-(07	Aqueous	1	10675	Surrogates	Smp	0.1100		4:2,8:2,ETAA SUR HI-NCM/ND, 6:2SUR HIGH-DETCT
48	WG28008-004DU	05-Aug-2021 00:24:59	080421A066.d	Client		Aqueous	1	10675	Surrogates	Smp	0.1100		RX/LDUP PASS SURS-NCM
49	WG28008-005	05-Aug-2021 00:35:35	080421A067.d	Client	ASTC-VAP-13GW(32-35)-(07	Aqueous	1	10675	Surrogates	Smp	0.1100		
50	WG28008-005MS	05-Aug-2021 00:46:12	080421A068.d	MS		Aqueous	1	10675	Analytes	100x PDS	0.2000		
54	CCV 1000C_SVLC-1600	05-Aug-2021 01:28:36	080421A072.d	CCV					Analytes	L-5	1.00		
100	CCB C4	05-Aug-2021 01:39:11	080421A073.d	InstBlk					Surrogates	Smp	0.1100		

Report Date: 05-Aug-2021 13:49:46 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080421A011.d	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11
2	080421A012.d	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42
3	080421A013.d	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14
4	080421A014.d	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48
5	080421A015.d	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20
6	080421A016.d	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54
7	080421A017.d	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27
8	080421A018.d	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03
9	080421A019.d	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39
10	080421A020.d	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	4.033	3.171	3.299	3.430	3.820	3.711	3.557	3.897	3.591	3.741	3.625	3.008-4.631	0.27062	1.910
1 4:2 FTS	0.891	1.201	1.249	1.294	1.448	1.432	1.630	1.651	1.722	1.544	1.406	0.707-2.188	0.24673	0.724
15 PFHxA	16.400	16.951	18.138	17.471	18.623	16.466	16.283	14.733	16.604	15.436	16.710	15.206-22.039	1.13893	9.311
22 PFPeS	3.682	2.573	3.232	3.249	2.999	3.130	3.255	3.420	3.449	3.425	3.241	2.126-3.871	0.29088	1.499
28 GenX	0.779	0.894	0.847	0.775	0.784	0.721	0.825	0.848	0.876	0.817	0.816	0.631-0.936	0.05085	0.392
13 PFHpA	3.343	3.047	3.094	3.220	3.208	3.050	3.074	3.219	3.087	3.145	3.148	2.930-3.485	0.09255	1.604
14 PFHxS	2.497	3.113	3.475	3.238	3.441	3.687	3.305	3.481	3.357	3.391	3.298	2.507-4.374	0.31131	1.720
29 ADONA	2.703	2.900	2.781	2.592	2.615	2.751	2.814	2.598	2.455	2.410	2.661	2.145-3.084	0.15652	1.307
2 6:2 FTS	1.513	1.571	1.531	1.642	1.410	1.498	1.531	1.417	1.662	1.564	1.533	1.143-1.676	0.08874	0.705
20 PFOA	2.648	3.000	2.914	2.670	2.927	2.689	2.735	2.645	2.767	2.649	2.764	2.443-3.410	0.16101	1.463
12 PFHpS	3.992	2.743	4.088	3.633	3.371	3.686	3.651	3.617	3.498	3.463	3.574	2.240-4.501	0.37695	1.685
18 PFOS	4.368	3.387	4.101	4.056	3.385	4.068	4.464	4.359	4.147	3.600	3.993	2.205-4.564	0.39320	1.692
17 PFNA	4.277	5.432	4.563	5.531	5.471	4.579	5.912	4.929	5.087	4.946	5.072	3.959-6.982	0.50369	2.735
19 PFOSA	44.550	28.005	37.987	41.151	43.685	41.949	38.299	41.733	36.645	40.089	39.409	28.745-58.624	4.97973	21.842
16 PFNS	2.954	3.297	3.405	3.283	3.135	3.386	3.364	3.283	3.061	3.227	3.239	2.683-3.586	0.15053	1.567
3 8:2 FTS	1.193	1.160	1.363	1.325	1.549	1.669	1.589	1.461	1.444	1.578	1.433	1.051-2.046	0.16581	0.774
10 PFDA	12.424	8.307	11.075	10.544	8.897	11.357	10.301	9.792	8.861	10.147	10.170	5.293-12.500	1.20132	4.448
6 N-MeFOSAA	1.556	1.639	1.434	1.626	1.608	1.437	1.513	1.393	1.468	1.468	1.514	1.281-1.934	0.10882	0.804
9 PFDS	3.025	2.485	3.620	3.275	2.663	3.419	3.199	3.142	3.348	3.454	3.163	1.566-3.759	0.36550	1.331
25 PFUdA	8.473	9.114	9.623	8.955	9.871	10.843	10.194	10.404	9.859	10.725	9.806	7.532-12.209	0.77939	4.935
5 N-EtFOSAA	2.076	1.696	2.179	1.687	1.754	1.904	1.864	1.652	1.868	1.687	1.836	1.220-2.287	0.17768	0.877
26 MeFOSA	Disabled	0.997	1.113	1.134	1.040	1.314	1.180	1.050	1.279	1.115	1.135	0.712-1.367	0.10907	0.520
27 EtFOSA	1.236	1.218	1.077	1.025	1.034	1.094	1.116	1.179	1.073	0.995	1.104	0.779-1.288	0.08472	0.517
11 PFDoA	7.722	7.525	7.336	8.224	7.769	7.622	7.936	7.355	8.049	7.517	7.705	6.714-8.823	0.35140	3.884
4 10:2 FTS	2.241	2.570	2.209	2.700	2.445	2.252	2.332	2.202	2.256	2.242	2.344	1.865-3.024	0.19319	1.222
34 PFDOS	2.489	3.402	3.096	3.678	3.453	3.433	3.498	3.289	3.445	3.311	3.309	2.418-4.487	0.34470	1.726
24 PFTrDA	3.424	3.095	3.262	3.145	3.752	3.273	3.319	3.837	3.437	3.629	3.417	2.955-4.548	0.26561	1.876
23 PFTeDA	9.475	8.796	9.372	10.073	10.084	9.239	8.861	9.145	8.835	9.292	9.317	8.565-11.602	0.50623	5.042
35 PFHxDA	15.500	12.334	12.869	13.681	12.750	12.745	13.543	13.451	12.864	12.947	13.268	9.851-15.648	0.96606	6.375
36 PFODA	117.329	88.441	87.472	91.372	99.455	105.511	99.069	96.996	101.048	110.358	99.705	70.901-128.008	9.51794	49.727

Report Date: 05-Aug-2021 13:49:45 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080421A011.d	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11
2	080421A012.d	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42
3	080421A013.d	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14
4	080421A014.d	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48
5	080421A015.d	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20
6	080421A016.d	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54
7	080421A017.d	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27
8	080421A018.d	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03
9	080421A019.d	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39
10	080421A020.d	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	1062	1048	1055	1061	1056	1064	1045	1049	1023	958	Avg:A Wt:C2	1042		RSD=3.1	
	101.9	100.6	101.3	101.8	101.3	102.1	100.3	100.7	98.2	91.9	Org:N Dep:R				
8 PFBA	1.069593	1.116188	1.095136	1.065782	1.041623	1.036417	1.066707	0.992516	0.951316	0.961705	Avg:A Wt:C2	1.039698		RSD=5.3	
	102.9	107.4	105.3	102.5	100.2	99.7	102.6	95.5	91.5	92.5	Org:N Dep:R				
D 50 13C5_PFPeA	1073	955	1019	1030	1049	1064	1071	989	954	943	Avg:A Wt:C2	1015		RSD=5.0	
	105.8	94.1	100.4	101.5	103.4	104.8	105.5	97.5	94	92.9	Org:N Dep:R				
21 PFPeA	1.113265	1.235754	1.164068	1.036911	1.053610	1.013091	1.040276	1.079213	1.018224	0.976648	Avg:A Wt:C2	1.073106		RSD=7.3	
	103.7	115.2	108.5	96.6	98.2	94.4	96.9	100.6	94.9	91	Org:N Dep:R				
D 44 13C3_PFBS	326	320	318	323	314	287	311	314	296	291	Avg:A Wt:C2	310		RSD=4.5	
	105	103.3	102.6	104.2	101.4	92.5	100.4	101.2	95.5	93.7	Org:N Dep:R				
7 PFBS	1.339754	1.185810	1.264375	1.269094	1.373764	1.411099	1.288542	1.338395	1.261518	1.250169	Avg:A Wt:C2	1.298252		RSD=5.1	
	103.2	91.3	97.4	97.8	105.8	108.7	99.3	103.1	97.2	96.3	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	1.999742	1.975003	2.042977	1.948913	1.807651	1.725322	1.831157	1.930616	1.926638	1.838555	Avg:A Wt:C2	1.902657		RSD=5.2	
	105.1	103.8	107.4	102.4	95	90.7	96.2	101.5	101.3	96.6	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	60.3504	64.6138	57.9386	52.7302	55.7984	64.9812	59.1096	55.4398	52.9680	52.0404	Avg:A Wt:C2	57.5970		RSD=8.1	
	104.8	112.2	100.6	91.6	96.9	112.8	102.6	96.3	92	90.4	Org:N Dep:R				
D 49 13C5_PFHxA	938	864	904	953	873	900	958	860	860	780	Avg:A Wt:C2	889		RSD=6.0	
	105.5	97.2	101.7	107.2	98.2	101.2	107.8	96.8	96.7	87.8	Org:N Dep:R				
15 PFHxA	1.065362	1.139650	0.922169	0.995091	1.111061	1.010287	0.925222	0.969699	0.953245	0.913140	Avg:A Wt:C2	1.000493		RSD=8.1	
	106.5	113.9	92.2	99.5	111.1	101	92.5	96.9	95.3	91.3	Org:N Dep:R				
22 PFPeS	0.996613	0.886050	0.897828	0.878917	0.926088	1.042636	0.895091	0.989261	0.976135	0.944894	Avg:A Wt:C2	0.943351		RSD=5.9	
	105.6	93.9	95.2	93.2	98.2	110.5	94.9	104.9	103.5	100.2	Org:N Dep:R				
28 GenX	0.888180	0.968940	0.914139	0.803047	0.826993	0.810443	0.870988	0.898226	0.918201	0.804467	Avg:A Wt:C2	0.870362		RSD=6.6	
	102	111.3	105	92.3	95	93.1	100.1	103.2	105.5	92.4	Org:N Dep:R				
D 66 13C3_GenX	137	133	136	137	122	125	125	121	112	118	Avg:A Wt:C2	127		RSD=6.9	
	108.3	105.1	107.5	108	96.7	98.8	98.4	95.6	88.1	93.6	Org:N Dep:R				
13 PFHpA	0.956811	0.867751	0.896707	0.881725	0.875065	0.897261	0.884850	0.934875	0.900841	0.846155	Avg:A Wt:C2	0.894204		RSD=3.6	
	107	97	100.3	98.6	97.9	100.3	99	104.5	100.7	94.6	Org:N Dep:R				
D 47 13C4_PFHpA	967	971	927	932	933	895	952	900	817	843	Avg:A Wt:C2	914		RSD=5.6	
	105.8	106.3	101.5	102	102.1	98	104.2	98.5	89.4	92.3	Org:N Dep:R				
D 45 13C3_PFHxS	257	251	247	260	254	241	267	254	231	216	Avg:A Wt:C2	248		RSD=6.0	
	103.5	101.2	99.8	105.1	102.7	97.4	107.5	102.4	93.2	87.1	Org:N Dep:R				
14 PFHxS	1.193964	1.125784	1.262319	1.138845	1.171364	1.244612	1.058734	1.127814	1.164460	1.195983	Avg:A Wt:C2	1.168388		RSD=5.1	
	102.2	96.4	108	97.5	100.3	106.5	90.6	96.5	99.7	102.4	Org:N Dep:R				
29 ADONA	5.891676	6.009961	6.412628	6.022446	5.741367	6.114825	5.825974	5.661116	5.810180	5.727135	Avg:A Wt:C2	5.921731		RSD=3.8	
	99.5	101.5	108.3	101.7	97	103.3	98.4	95.6	98.1	96.7	Org:N Dep:R				
2 6:2 FTS	1.857010	2.251216	1.991561	1.962061	1.911024	1.658609	1.810272	1.949022	1.952666	1.827241	Avg:A Wt:C2	1.917068		RSD=8.0	
	96.9	117.4	103.9	102.3	99.7	86.5	94.4	101.7	101.9	95.3	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	53.5660	48.7266	53.2230	51.7098	50.1068	56.5290	52.3614	44.9840	45.4620	45.1060	Avg:A Wt:C2	50.1775		RSD=8.0	
	106.8	97.1	106.1	103.1	99.9	112.7	104.4	89.6	90.6	89.9	Org:N Dep:R				
D 53 13C8_PFOA	917	927	1006	947	920	931	914	877	836	798	Avg:A Wt:C2	907		RSD=6.4	
	101.1	102.2	110.9	104.3	101.4	102.6	100.8	96.7	92.1	88	Org:N Dep:R				
20 PFOA	1.062529	1.068863	1.004984	0.986843	1.064508	0.968555	0.986146	0.969901	0.963871	0.946078	Avg:A Wt:C2	1.002228		RSD=4.6	
	106	106.6	100.3	98.5	106.2	96.6	98.4	96.8	96.2	94.4	Org:N Dep:R				
12 PFHpS	1.032852	0.935592	1.140781	0.999214	0.975659	1.079178	0.953845	0.990193	1.002718	1.009141	Avg:A Wt:C2	1.011917		RSD=6.0	
	102.1	92.5	112.7	98.7	96.4	106.6	94.3	97.9	99.1	99.7	Org:N Dep:R				
D 56 13C9_PFNA	919	939	916	879	904	848	833	822	800	802	Avg:A Wt:C2	866		RSD=6.0	
	106.1	108.4	105.7	101.4	104.4	97.9	96.2	94.9	92.4	92.6	Org:N Dep:R				
D 54 13C8_PFOS	230	237	238	246	219	214	216	217	214	194	Avg:A Wt:C2	223		RSD=6.9	
	103.4	106.6	107	110.5	98.5	96.2	97	97.3	96.2	87.3	Org:N Dep:R				
18 PFOS	1.279182	1.017367	1.118497	1.000925	1.140955	1.190532	1.137854	1.177537	1.145607	1.089138	Avg:A Wt:C2	1.129759		RSD=7.2	
	113.2	90.1	99	88.6	101	105.4	100.7	104.2	101.4	96.4	Org:N Dep:R				
17 PFNA	0.845686	0.846394	0.905171	0.960103	0.960155	0.892432	1.001819	0.922154	0.883469	0.821413	Avg:A Wt:C2	0.903879		RSD=6.4	
	93.6	93.6	100.1	106.2	106.2	98.7	110.8	102	97.7	90.9	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.390300	2.719320	2.946826	2.642292	2.937006	3.094882	3.533645	3.061839	2.961322	3.008653	Avg:A Wt:C2	3.029609		RSD=8.9	
	111.9	89.8	97.3	87.2	96.9	102.2	116.6	101.1	97.7	99.3	Org:N Dep:R				
D 55 13C8_PFOSA	452	447	456	440	428	428	392	411	411	415	Avg:A Wt:C2	428		RSD=4.9	
	105.7	104.4	106.4	102.8	100	100.1	91.6	96	96	97	Org:N Dep:R				
19 PFOSA	1.043774	1.008207	1.054050	1.109229	1.203441	1.105565	1.164264	1.158109	1.086943	0.997277	Avg:A Wt:C2	1.093086		RSD=6.3	
	95.5	92.2	96.4	101.5	110.1	101.1	106.5	105.9	99.4	91.2	Org:N Dep:R				
16 PFNS	0.773371	0.910460	0.927570	0.810264	0.870978	0.941332	0.945937	0.897167	0.882942	0.873268	Avg:A Wt:C2	0.883329		RSD=6.3	
	87.6	103.1	105	91.7	98.6	106.6	107.1	101.6	100	98.9	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	49.5582	46.1166	46.3270	47.9646	47.8918	49.0066	45.6484	43.0064	39.2480	36.2786	Avg:A Wt:C2	45.1046		RSD=9.6	
	109.9	102.2	102.7	106.3	106.2	108.7	101.2	95.3	87	80.4	Org:N Dep:R				
D 51 13C6_PFDA	790	840	819	871	810	775	756	684	661	660	Avg:A Wt:C2	767		RSD=9.8	
	103	109.6	106.8	113.6	105.7	101.1	98.6	89.3	86.3	86.1	Org:N Dep:R				
3 8:2 FTS	2.098711	1.676788	1.876467	1.879474	1.730698	1.775005	1.743521	1.654366	1.624679	1.672599	Avg:A Wt:C2	1.773231		RSD=8.1	
	118.4	94.6	105.8	106	97.6	100.1	98.3	93.3	91.6	94.3	Org:N Dep:R				
10 PFDA	1.229156	0.899680	0.942945	0.882904	0.913501	0.952931	0.942462	0.897689	0.954715	0.876039	Avg:A Wt:C2	0.949202		RSD=10.8	
	129.5	94.8	99.3	93	96.2	100.4	99.3	94.6	100.6	92.3	Org:N Dep:R				
D 58 d3-MeFOSAA	205	200	208	216	232	193	193	200	194	186	Avg:A Wt:C2	203		RSD=6.6	
	101.2	98.7	102.5	106.4	114.3	95.2	95.5	98.7	95.8	91.7	Org:N Dep:R				
6 N-MeFOSAA	0.883721	0.856292	0.808512	0.852573	0.775059	0.876729	0.852609	0.717091	0.796358	0.832583	Avg:A Wt:C2	0.825153		RSD=6.2	
	107.1	103.8	98	103.3	93.9	106.3	103.3	86.9	96.5	100.9	Org:N Dep:R				
9 PFDS	0.997724	0.805639	0.933827	0.921459	0.904412	1.041552	0.974540	0.997938	0.947134	1.021359	Avg:A Wt:C2	0.954558		RSD=7.2	
	104.5	84.4	97.8	96.5	94.7	109.1	102.1	104.5	99.2	107	Org:N Dep:R				
D 60 d5-EtFOSAA	183	201	191	196	192	191	184	174	154	136	Avg:A Wt:C2	180		RSD=11.2	
	101.6	111.4	106.1	108.6	106.3	105.9	102.1	96.7	85.4	75.7	Org:N Dep:R				
D 52 13C7_PFUdA	638	795	808	739	727	720	722	705	626	606	Avg:A Wt:C2	709		RSD=9.6	
	90	112.2	114	104.3	102.6	101.6	101.8	99.5	88.3	85.5	Org:N Dep:R				
25 PFUdA	1.125507	0.840470	0.882786	0.937794	0.925201	0.943945	0.876229	0.915676	0.867638	0.868984	Avg:A Wt:C2	0.918423		RSD=8.7	
	122.5	91.5	96.1	102.1	100.7	102.8	95.4	99.7	94.5	94.6	Org:N Dep:R				
5 N-EtFOSAA	1.014666	1.081996	1.112985	1.015752	0.988404	1.002302	1.062077	1.026670	1.080847	1.127685	Avg:A Wt:C2	1.051338		RSD=4.6	
	96.5	102.9	105.9	96.6	94	95.3	101	97.7	102.8	107.3	Org:N Dep:R				
D 61 d7-MeFOSE	152	138	135	138	129	139	132	126	135	133	Avg:A Wt:C2	136		RSD=5.2	
	111.9	101.7	99.4	101.9	95.2	102.7	97	93	99.1	98.2	Org:N Dep:R				
D 57 d3-MeFOSA	61.4410	58.7850	60.4730	67.1010	58.0220	62.8210	60.2470	61.5940	54.6550	56.5240	Avg:A Wt:C2	60.1663		RSD=5.8	
	102.1	97.7	100.5	111.5	96.4	104.4	100.1	102.4	90.8	93.9	Org:N Dep:R				
32 MeFOSE	1.068864	0.971816	1.112466	1.085730	0.945340	0.953354	1.006529	1.053013	0.938159	0.937151	Avg:A Wt:C2	1.007242		RSD=6.7	
	106.1	96.5	110.4	107.8	93.9	94.6	99.9	104.5	93.1	93	Org:N Dep:R				
26 MeFOSA	Disabled	1.125968	0.956543	1.060729	1.096377	1.048121	1.086969	1.046693	1.337857	1.033636	Avg:A Wt:C2	1.088099		RSD=9.7	
	Disabled	103.5	87.9	97.5	100.8	96.3	99.9	96.2	123	95	Org:N Dep:R				
31 11Cl-PF3OUDS	2.273083	2.250060	2.289270	2.175938	2.482274	2.556557	2.642938	2.685198	2.489184	2.629783	Avg:A Wt:C2	2.447429		RSD=7.6	
	92.9	91.9	93.5	88.9	101.4	104.5	108	109.7	101.7	107.5	Org:N Dep:R				
D 62 d9-EtFOSE	134	136	121	129	126	124	132	134	145	133	Avg:A Wt:C2	131		RSD=5.1	
	102	103.6	92.3	98.2	95.6	94.5	100.6	102.1	110.1	101.1	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	0.834921	0.587630	0.815750	0.750819	0.732426	0.739083	0.754795	0.714281	0.682871	0.708733	Avg:A Wt:C2	0.732131		RSD=9.4	
	114	80.3	111.4	102.6	100	100.9	103.1	97.6	93.3	96.8	Org:N Dep:R				
D 59 d5-EtFOSA	60.5880	62.0700	58.2750	55.2650	61.5170	53.6200	61.7160	56.6060	57.3220	59.9120	Avg:A Wt:C2	58.6891		RSD=5.0	
	103.2	105.8	99.3	94.2	104.8	91.4	105.2	96.5	97.7	102.1	Org:N Dep:R				
27 EtFOSA	1.231597	1.018850	1.180094	1.082711	1.045727	1.166244	1.018060	1.186924	1.020171	0.977408	Avg:A Wt:C2	1.092779		RSD=8.2	
	112.7	93.2	108	99.1	95.7	106.7	93.2	108.6	93.4	89.4	Org:N Dep:R				
D 38 13C2_PFDoA	750	707	696	714	691	749	736	690	706	633	Avg:A Wt:C2	707		RSD=4.9	
	106	100	98.4	101	97.7	106	104.1	97.6	99.8	89.5	Org:N Dep:R				
11 PFDoA	1.056248	1.050965	1.107564	1.016592	0.962042	0.935006	0.928807	0.979876	0.867819	0.908459	Avg:A Wt:C2	0.981338		RSD=7.7	
	107.6	107.1	112.9	103.6	98	95.3	94.6	99.9	88.4	92.6	Org:N Dep:R				
4 10:2 FTS	2.320085	1.803790	2.046050	2.003466	1.939560	1.828274	1.824190	1.845651	1.870927	1.960531	Avg:A Wt:C2	1.944252		RSD=8.0	
	119.3	92.8	105.2	103	99.8	94	93.8	94.9	96.2	100.8	Org:N Dep:R				
34 PFDOS	0.630611	0.761851	0.638148	0.662510	0.750795	0.754911	0.758513	0.735967	0.733974	0.758287	Avg:A Wt:C2	0.718557		RSD=7.4	
	87.8	106	88.8	92.2	104.5	105.1	105.6	102.4	102.1	105.5	Org:N Dep:R				
24 PFTrDA	0.417890	0.408683	0.402150	0.400559	0.461189	0.384950	0.391926	0.463658	0.393263	0.424411	Avg:A Wt:C2	0.414868		RSD=6.7	
	100.7	98.5	96.9	96.6	111.2	92.8	94.5	111.8	94.8	102.3	Org:N Dep:R				
D 42 13C2_PFTeDA	967	877	880	900	788	817	826	901	787	837	Avg:A Wt:C2	858		RSD=6.6	
	112.6	102.2	102.6	104.8	91.9	95.2	96.3	105	91.7	97.6	Org:N Dep:R				
23 PFTeDA	0.819193	0.872608	0.863665	0.811596	0.906066	0.871525	0.844628	0.804179	0.807807	0.788125	Avg:A Wt:C2	0.838939		RSD=4.6	
	97.6	104	102.9	96.7	108	103.9	100.7	95.9	96.3	93.9	Org:N Dep:R				
D 40 13C2_PFHxDA	399	389	394	393	380	396	373	385	363	343	Avg:A Wt:C2	381		RSD=4.6	
	104.7	101.9	103.2	103	99.6	103.7	97.7	101	95.2	89.9	Org:N Dep:R				
35 PFHxDA	2.065872	1.885772	1.766584	1.672608	1.669074	1.667050	1.740511	1.571191	1.629458	1.652842	Avg:A Wt:C2	1.732096		RSD=8.4	
	119.3	108.9	102	96.6	96.4	96.2	100.5	90.7	94.1	95.4	Org:N Dep:R				
36 PFODA	1.104355	1.055476	1.019965	1.032164	1.005032	0.978737	1.049484	1.021000	1.006750	1.068271	Avg:A Wt:C2	1.034123		RSD=3.5	
	106.8	102.1	98.6	99.8	97.2	94.6	101.5	98.7	97.4	103.3	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080421A011.d	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11
2	080421A012.d	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42
3	080421A013.d	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14
4	080421A014.d	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48
5	080421A015.d	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20
6	080421A016.d	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54
7	080421A017.d	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27
8	080421A018.d	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03
9	080421A019.d	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39
10	080421A020.d	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	790264	767044	787237	787735	782059	746942	731398	779788	648667	694404	3.22
* 39 13C2_PFHxA	861612	896067	873937	812948	862203	855542	830784	799064	810887	791574	2.11
* 41 13C2_PFOA	952707	905164	912560	934270	1005174	930606	953869	901253	907967	813545	3.93
* 43 13C3_PFBA	1036502	1026131	1040176	1036824	1060027	1034632	1023793	1017113	990993	927303	2.78
* 48 13C4_PFOS	237004	223749	234551	234522	214696	253380	230899	228368	218107	211791	2.80

13C2_PFDA ((|694404 - 790264| / (694404 + 790264)) / 2) * 100 = 3.23
13C2_PFHxA ((|791574 - 861612| / (791574 + 861612)) / 2) * 100 = 2.12
13C2_PFOA ((|813545 - 952707| / (813545 + 952707)) / 2) * 100 = 3.94
13C3_PFBA ((|927303 - 1036502| / (927303 + 1036502)) / 2) * 100 = 2.78
13C4_PFOS ((|211791 - 237004| / (211791 + 237004)) / 2) * 100 = 2.81

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080421A011.d	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11
2	080421A012.d	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42
3	080421A013.d	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14
4	080421A014.d	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48
5	080421A015.d	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20
6	080421A016.d	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54
7	080421A017.d	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27
8	080421A018.d	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03
9	080421A019.d	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39
10	080421A020.d	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1061824	1048497	1055216	1060737	1055815	1064225	1045265	1049255	1023013	957707	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	56786	117032	231121	565257	1099761	2205961	5574959	10414022	14598133	18420631	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1073150	954891	1018635	1030189	1049419	1063636	1070987	989337	953777	942842	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	59735	118001	237152	534107	1105678	2155120	5570610	10677050	14567380	18416497	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	325666	320437	318169	323188	314416	286882	311270	313835	296214	290646	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	19285	33590	71124	181289	381829	715720	1772793	3713110	4954986	6424145	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	5636	11919	22111	47992	94207	209428	505476	999688	1429723	1787286	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	301752	323069	289693	263651	278992	324906	295548	277199	264840	260202	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	937522	863730	904200	952809	872566	899737	957978	860302	860022	780475	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	861612	896067	873937	812948	862203	855542	830784	799064	810887	791574	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	49940	98435	166765	474066	969474	1817985	4431711	8342341	12297180	14253656	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	15222	26632	53590	133222	273124	561137	1306704	2912160	4068268	5152050	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	12176	25775	49750	109756	202418	405434	1084877	2174440	3073796	3812787	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	685447	665031	680285	683372	611910	625328	622785	605204	557938	592440	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	46249	84274	166333	410750	816513	1606506	4213434	8415577	11038855	14270539	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	966732	971177	927466	931696	933088	895228	952350	900182	816930	843258	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	256510	250785	247421	260335	254408	241439	266501	253867	231072	215785	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	13935	25692	56843	134899	271184	546906	1283799	2605465	3672863	4696967	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	71181	141979	298919	738459	1375932	2781457	7312878	13538147	18970512	23283034	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	4715	10399	20097	48091	90776	177768	449297	831157	1262339	1562674	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	267830	243633	266115	258549	250534	282645	261807	224920	227310	225530	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	952707	905164	912560	934270	1005174	930606	953869	901253	907967	813545	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	917302	927331	1006265	946722	919907	930736	914444	877125	836118	798291	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	48733	99119	202256	467133	979248	1802938	4508876	8507241	12088647	15104917	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	12611	22337	53741	123822	236301	496098	1209995	2393112	3308677	4146104	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	918899	939113	915910	878627	904226	848099	833128	822329	800131	802146	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	230296	237460	238139	246031	219295	214252	215889	216745	214149	194364	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	237004	223749	234551	234522	214696	253380	230899	228368	218107	211791	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	13669	22419	49436	114264	232191	473417	1139817	2368490	3415001	3928953	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	38855	79486	165811	421786	868197	1513742	4173216	7583136	10603362	13177860	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	36384	60182	130807	302940	600274	1235990	3554998	6185108	8865615	10900185	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	452435	446942	455538	439992	428055	428292	391918	410838	411043	415172	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	23612	45061	96032	244026	515139	947009	2281480	4757951	6701702	8280827	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	8549	20755	42411	95688	183361	387230	980244	1866782	2722769	3258850	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	247791	230583	231635	239823	239459	245033	228242	215032	196240	181393	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	790264	767044	787237	787735	782059	746942	731398	779788	648667	694404	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	789859	840354	818526	870690	809951	774689	755954	684467	661374	659800	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	4982	7408	16656	43181	79405	166667	381231	681601	916309	1162620	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	48543	75605	154365	384368	739891	1476450	3562291	6144383	9471354	11560207	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1025663	1000009	1038791	1077796	1157951	964349	967314	999410	970067	929393	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	9064	17126	33595	91890	179496	338189	824741	1433336	2317561	3095186	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	11075	18442	42875	109273	191193	430242	1014092	2085114	2932890	3827379	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	914981	1003747	956100	978556	957645	953784	919765	871299	769444	682126	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	638006	795460	807874	739480	726972	720360	721628	705316	625625	606283	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	35904	66856	142636	346740	672595	1359960	3161556	6458410	8142237	10537000	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	9284	21721	42565	99397	189308	382392	976861	1789073	2494953	3076893	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	151937	138092	134912	138377	129289	139379	131657	126262	134546	133283	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	61441	58785	60473	67101	58022	62821	60247	61594	54655	56524	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	8120	13420	30017	75120	122222	265755	662583	1329555	1893384	2498126	
26 MeFOSA	Disabled	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	Disabled	6619	11569	35588	63614	131688	327433	644700	1096809	1168505	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	24656	50331	102709	252149	512778	1031956	2687438	5482471	7532086	9629785	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	133857	136004	121232	128894	125524	124007	132043	134007	144569	132706	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	5588	7992	19779	48388	91937	183303	498327	957186	1480830	1881063	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	60588	62070	58275	55265	61517	53620	61716	56606	57322	59912	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3731	6324	13754	29918	64330	125068	314153	671870	877174	1171169	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	749862	706979	695910	713972	690580	749290	736381	689878	705767	633260	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	39602	74301	154153	362909	664367	1401182	3419779	6759947	9187170	11505809	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	5542	8019	18275	46318	89545	172744	401368	765173	1061800	1371296	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	7029	17512	29421	78891	159377	313131	792572	1544127	2282251	2853347	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	15668	28893	55972	142994	318488	576878	1443033	3198673	4163285	5375248	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	966561	877141	880006	899595	788343	816826	826364	901166	787053	837206	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	39590	76540	152006	365054	714291	1423769	3489849	7246991	9536800	13196463	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	399473	388801	393641	393052	379801	395692	372724	385384	363249	342928	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41263	73319	139080	328711	633916	1319277	3243651	6055120	8878486	11336119	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	22058	41037	80300	202847	381712	774557	1955839	3934770	5485514	7326803	

Report Date: 05-Aug-2021 13:49:46 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080421A011.d	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11
2	080421A012.d	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42
3	080421A013.d	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14
4	080421A014.d	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48
5	080421A015.d	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20
6	080421A016.d	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54
7	080421A017.d	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27
8	080421A018.d	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03
9	080421A019.d	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39
10	080421A020.d	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.708	1.708	1.708	1.709	1.708	1.715	1.714	1.709	1.708	1.708	1.709	0.148
8 PFBA	1.708	1.715	1.715	1.715	1.714	1.715	1.714	1.715	1.715	1.714	1.714	0.117
D 50 13C5_PFPeA	2.068	2.068	2.068	2.069	2.068	2.078	2.078	2.068	2.068	2.068	2.070	0.218
21 PFPeA	2.068	2.068	2.068	2.069	2.068	2.078	2.078	2.068	2.068	2.068	2.070	0.218
D 44 13C3_PFBS	2.120	2.131	2.131	2.131	2.120	2.131	2.131	2.131	2.120	2.120	2.126	0.252
7 PFBS	2.131	2.131	2.131	2.131	2.120	2.131	2.131	2.131	2.120	2.120	2.127	0.234
1 4:2 FTS	2.407	2.407	2.407	2.407	2.398	2.407	2.398	2.407	2.398	2.398	2.403	0.196
D 63 13C2_4:2 FTS_2	2.407	2.407	2.407	2.399	2.398	2.407	2.407	2.407	2.398	2.398	2.403	0.187
D 49 13C5_PFHxA	2.441	2.441	2.442	2.442	2.441	2.450	2.450	2.442	2.441	2.441	2.443	0.147
* 39 13C2_PFHxA	2.441	2.441	2.442	2.442	2.441	2.450	2.441	2.451	2.441	2.441	2.443	0.155
15 PFHxA	2.441	2.441	2.442	2.451	2.441	2.450	2.441	2.442	2.441	2.441	2.443	0.155
22 PFPeS	2.476	2.476	2.476	2.477	2.476	2.476	2.485	2.477	2.476	2.476	2.477	0.108
28 GenX	2.563	2.563	2.554	2.563	2.563	2.563	2.563	2.564	2.563	2.563	2.561	0.103
D 66 13C3_GenX	2.563	2.563	2.563	2.563	2.563	2.563	2.563	2.564	2.554	2.563	2.562	0.105
13 PFHpA	2.829	2.828	2.820	2.830	2.819	2.828	2.828	2.821	2.820	2.818	2.824	0.170
D 47 13C4_PFHpA	2.820	2.828	2.820	2.821	2.819	2.828	2.828	2.821	2.820	2.818	2.822	0.150
D 45 13C3_PFHxS	2.837	2.846	2.837	2.839	2.837	2.846	2.846	2.839	2.837	2.836	2.840	0.141
14 PFHxS	2.837	2.846	2.837	2.839	2.837	2.837	2.846	2.839	2.837	2.836	2.839	0.119
29 ADONA	2.864	2.863	2.864	2.865	2.863	2.864	2.863	2.865	2.864	2.862	2.863	0.033
2 6:2 FTS	3.170	3.183	3.176	3.185	3.179	3.183	3.179	3.179	3.172	3.170	3.177	0.163
D 64 13C2_6:2 FTS_2	3.177	3.183	3.182	3.185	3.179	3.177	3.179	3.179	3.172	3.170	3.178	0.145
* 41 13C2_PFOA	3.202	3.202	3.202	3.204	3.198	3.209	3.204	3.204	3.198	3.202	3.202	0.103
D 53 13C8_PFOA	3.209	3.202	3.202	3.210	3.204	3.209	3.204	3.198	3.204	3.202	3.204	0.125
20 PFOA	3.209	3.208	3.202	3.210	3.204	3.209	3.204	3.204	3.198	3.202	3.204	0.128
12 PFHpS	3.209	3.208	3.202	3.210	3.210	3.209	3.210	3.210	3.204	3.208	3.208	0.093
D 56 13C9_PFNA	3.577	3.584	3.576	3.580	3.573	3.586	3.573	3.573	3.580	3.576	3.577	0.130
D 54 13C8_PFOS	3.577	3.569	3.576	3.573	3.573	3.571	3.573	3.565	3.565	3.569	3.571	0.111
* 48 13C4_PFOS	3.569	3.576	3.576	3.573	3.573	3.571	3.573	3.565	3.565	3.569	3.571	0.109
18 PFOS	3.569	3.576	3.569	3.573	3.573	3.571	3.573	3.565	3.573	3.569	3.571	0.086
17 PFNA	3.577	3.576	3.576	3.580	3.580	3.578	3.580	3.573	3.573	3.576	3.577	0.084
30 9Cl-PF3ONS	3.773	3.781	3.778	3.775	3.775	3.774	3.775	3.775	3.775	3.773	3.775	0.059
D 55 13C8_PFOSA	3.854	3.854	3.851	3.856	3.848	3.855	3.856	3.848	3.848	3.846	3.851	0.089
19 PFOSA	3.862	3.854	3.851	3.856	3.856	3.855	3.856	3.848	3.848	3.846	3.853	0.116

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.907	3.906	3.912	3.908	3.908	3.907	3.908	3.901	3.908	3.899	3.906	0.102
D 65 13C2_8:2 FTS_2	3.914	3.914	3.912	3.908	3.908	3.907	3.908	3.908	3.908	3.906	3.909	0.072
* 37 13C2_PFDA	3.922	3.922	3.919	3.916	3.916	3.915	3.916	3.916	3.916	3.914	3.916	0.074
D 51 13C6_PFDA	3.922	3.922	3.919	3.923	3.916	3.915	3.916	3.916	3.916	3.914	3.917	0.090
3 8:2 FTS	3.914	3.922	3.919	3.916	3.916	3.915	3.916	3.908	3.908	3.906	3.914	0.124
10 PFDA	3.914	3.922	3.919	3.923	3.923	3.922	3.923	3.916	3.916	3.914	3.919	0.105
D 58 d3-MeFOSAA	4.074	4.074	4.071	4.077	4.069	4.075	4.069	4.077	4.069	4.066	4.071	0.099
6 N-MeFOSAA	4.082	4.082	4.079	4.077	4.077	4.075	4.077	4.077	4.077	4.074	4.077	0.073
9 PFDS	4.205	4.214	4.211	4.208	4.208	4.206	4.200	4.200	4.200	4.205	4.205	0.114
D 60 d5-EtFOSAA	4.232	4.232	4.228	4.225	4.225	4.224	4.225	4.225	4.225	4.222	4.226	0.077
D 52 13C7_PFUdA	4.214	4.222	4.228	4.225	4.225	4.224	4.217	4.225	4.225	4.222	4.222	0.108
25 PFUdA	4.223	4.232	4.228	4.225	4.225	4.224	4.225	4.225	4.225	4.222	4.225	0.065
5 N-EtFOSAA	4.242	4.241	4.228	4.235	4.235	4.233	4.235	4.235	4.235	4.232	4.234	0.094
D 61 d7-MeFOSE	4.270	4.270	4.266	4.273	4.272	4.271	4.263	4.263	4.263	4.269	4.268	0.086
D 57 d3-MeFOSA	4.279	4.288	4.285	4.291	4.282	4.280	4.282	4.282	4.282	4.288	4.283	0.094
32 MeFOSE	4.279	4.270	4.285	4.273	4.282	4.280	4.282	4.273	4.273	4.279	4.277	0.119
26 MeFOSA	Disabled	4.297	4.294	4.291	4.291	4.290	4.291	4.291	4.291	4.288	4.291	0.064
31 11Cl-PF3OUDS	4.362	4.370	4.367	4.365	4.365	4.363	4.365	4.365	4.356	4.362	4.363	0.090
D 62 d9-EtFOSE	4.426	4.433	4.431	4.429	4.428	4.427	4.429	4.429	4.429	4.426	4.428	0.044
33 EtFOSE	4.440	4.433	4.437	4.442	4.442	4.441	4.442	4.442	4.435	4.439	4.439	0.078
D 59 d5-EtFOSA	4.447	4.446	4.451	4.449	4.449	4.448	4.449	4.449	4.449	4.446	4.448	0.035
27 EtFOSA	4.447	4.453	4.458	4.456	4.456	4.455	4.456	4.456	4.456	4.453	4.454	0.067
D 38 13C2_PFDoA	4.494	4.494	4.499	4.497	4.488	4.495	4.488	4.497	4.497	4.494	4.494	0.075
11 PFDoA	4.494	4.502	4.499	4.488	4.496	4.495	4.488	4.497	4.488	4.494	4.494	0.104
4 10:2 FTS	4.511	4.502	4.507	4.505	4.505	4.504	4.505	4.505	4.505	4.502	4.504	0.051
34 PFDOS	4.712	4.711	4.708	4.706	4.706	4.705	4.706	4.706	4.706	4.704	4.706	0.059
24 PFTrDA	4.736	4.736	4.733	4.737	4.737	4.730	4.731	4.731	4.731	4.730	4.733	0.064
D 42 13C2_PFTeDA	4.952	4.960	4.958	4.956	4.948	4.952	4.956	4.948	4.948	4.951	4.952	0.091
23 PFTeDA	4.960	4.960	4.958	4.956	4.956	4.952	4.956	4.948	4.956	4.951	4.955	0.078
D 40 13C2_PFHxDA	5.343	5.352	5.348	5.347	5.338	5.343	5.347	5.338	5.338	5.334	5.342	0.099
35 PFHxDA	5.352	5.352	5.348	5.347	5.347	5.343	5.347	5.347	5.347	5.343	5.346	0.056
36 PFODA	5.733	5.733	5.723	5.722	5.722	5.725	5.722	5.722	5.715	5.718	5.723	0.099

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A026.d
Injection Date: 04-Aug-2021 17:21:32 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1590 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1055815	1110603			105.2	50 - 150
8 PFBA			500.00	512.00	102.4	70 - 130
21 PFPeA			500.00	458.22	91.6	70 - 130
D 50 13C5_PFPeA	1049419	1062773			101.3	50 - 150
D 44 13C3_PFBS	314416	330408			105.1	50 - 150
7 PFBS			442.50	428.46	96.8	70 - 130
1 4:2 FTS			467.50	418.53	89.5	70 - 130
D 63 13C2_4:2 FTS_2	278992	336383			120.6	50 - 150
D 49 13C5_PFHxA	872566	884415			101.4	50 - 150
15 PFHxA			500.00	492.79	98.6	70 - 130
22 PFPeS			470.00	465.26	99	70 - 130
28 GenX			2500.00	2182.01	87.3	70 - 130
D 66 13C3_GenX	611910	675680			110.4	50 - 150
D 47 13C4_PFHpA	933088	1012497			108.5	50 - 150
13 PFHpA			500.00	476.85	95.4	70 - 130
D 45 13C3_PFHxS	254408	265077			104.2	50 - 150
14 PFHxS			456.00	421.58	92.5	70 - 130
29 ADONA			2355.00	2301.60	97.7	70 - 130
D 64 13C2_6:2 FTS_2	250534	258062			103	50 - 150
2 6:2 FTS			475.00	466.13	98.1	70 - 130
20 PFOA			500.00	513.89	102.8	70 - 130
D 53 13C8_PFOA	919907	906116			98.5	50 - 150
12 PFHpS			475.00	443.59	93.4	70 - 130
18 PFOS			462.75	480.92	103.9	70 - 130
D 54 13C8_PFOS	219295	232440			106	50 - 150
D 56 13C9_PFNA	904226	923897			102.2	50 - 150
17 PFNA			500.00	498.02	99.6	70 - 130
30 9Cl-PF3ONS			2330.00	2150.99	92.3	70 - 130
D 55 13C8_PFOSA	428055	446140			104.2	50 - 150
19 PFOSA			500.00	514.12	102.8	70 - 130
16 PFNS			480.00	492.61	102.6	70 - 130
D 65 13C2_8:2 FTS_2	239459	258601			108	50 - 150
3 8:2 FTS			480.00	449.09	93.6	70 - 130
D 51 13C6_PFDA	809951	805018			99.4	50 - 150
10 PFDA			500.00	506.05	101.2	70 - 130
D 58 d3-MeFOSAA	1157951	1094947			94.6	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	587.36	117.5	70 - 130
9 PFDS			482.50	458.64	95.1	70 - 130
25 PFUdA			500.00	446.26	89.3	70 - 130
D 60 d5-EtFOSAA	957645	973780			101.7	50 - 150
D 52 13C7_PFUdA	726972	838500			115.3	50 - 150
5 N-EtFOSAA			500.00	587.59	117.5	70 - 130
D 61 d7-MeFOSE	129289	146493			113.3	50 - 150
D 57 d3-MeFOSA	58022	62808			108.2	50 - 150
31 11Cl-PF3OUDS			2355.00	2297.51	97.6	70 - 130
D 62 d9-EtFOSE	125524	139583			111.2	50 - 150
D 59 d5-EtFOSA	61517	59126			96.1	50 - 150
D 38 13C2_PFDoA	690580	687401			99.5	50 - 150
11 PFDoA			500.00	513.67	102.7	70 - 130
4 10:2 FTS			2410.00	2180.56	90.5	70 - 130
24 PFTrDA			500.00	527.93	105.6	70 - 130
D 42 13C2_PFTeDA	788343	898725			114	50 - 150
23 PFTeDA			500.00	526.35	105.3	70 - 130
D 40 13C2_PFHxDA	379801	450558			118.6	50 - 150

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A036.d
Injection Date: 04-Aug-2021 19:07:12 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 21
Sample Info: CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1055815	1061269			100.5	50 - 150
8 PFBA			1000.00	978.75	97.9	70 - 130
21 PFPeA			1000.00	1065.78	106.6	70 - 130
D 50 13C5_PFPeA	1049419	1003321			95.6	50 - 150
D 44 13C3_PFBS	314416	331231			105.3	50 - 150
7 PFBS			884.00	820.11	92.8	70 - 130
1 4:2 FTS			934.00	876.60	93.9	70 - 130
D 63 13C2_4:2 FTS_2	278992	306169			109.7	50 - 150
D 49 13C5_PFHxA	872566	940123			107.7	50 - 150
15 PFHxA			1000.00	957.54	95.8	70 - 130
22 PFPeS			938.00	896.11	95.5	70 - 130
28 GenX			2000.00	1946.58	97.3	70 - 130
D 66 13C3_GenX	611910	639178			104.5	50 - 150
D 47 13C4_PFHpA	933088	1041660			111.6	50 - 150
13 PFHpA			1000.00	924.34	92.4	70 - 130
D 45 13C3_PFHxS	254408	247252			97.2	50 - 150
14 PFHxS			910.00	948.04	104.2	70 - 130
29 ADONA			942.00	919.50	97.6	70 - 130
D 64 13C2_6:2 FTS_2	250534	253363			101.1	50 - 150
2 6:2 FTS			948.00	960.34	101.3	70 - 130
20 PFOA			1000.00	1020.56	102.1	70 - 130
D 53 13C8_PFOA	919907	939204			102.1	50 - 150
12 PFHpS			952.00	947.39	99.5	70 - 130
18 PFOS			928.00	848.86	91.5	70 - 130
D 54 13C8_PFOS	219295	231839			105.7	50 - 150
D 56 13C9_PFNA	904226	945716			104.6	50 - 150
17 PFNA			1000.00	893.80	89.4	70 - 130
30 9Cl-PF3ONS			932.00	875.81	94	70 - 130
D 55 13C8_PFOSA	428055	410364			95.9	50 - 150
19 PFOSA			1000.00	1092.42	109.2	70 - 130
16 PFNS			960.00	943.40	98.3	70 - 130
D 65 13C2_8:2 FTS_2	239459	263670			110.1	50 - 150
3 8:2 FTS			958.00	829.61	86.6	70 - 130
D 51 13C6_PFDA	809951	791080			97.7	50 - 150
10 PFDA			1000.00	973.21	97.3	70 - 130
D 58 d3-MeFOSAA	1157951	1058013			91.4	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	957.90	95.8	70 - 130
9 PFDS			964.00	1137.25	118	70 - 130
25 PFUdA			1000.00	902.92	90.3	70 - 130
D 60 d5-EtFOSAA	957645	973460			101.7	50 - 150
D 52 13C7_PFUdA	726972	759018			104.4	50 - 150
5 N-EtFOSAA			1000.00	927.31	92.7	70 - 130
D 61 d7-MeFOSE	129289	146949			113.7	50 - 150
D 57 d3-MeFOSA	58022	73358			126.4	50 - 150
32 MeFOSE			1000.00	902.74	90.3	70 - 130
26 MeFOSA			1000.00	849.35	84.9	70 - 130
31 11Cl-PF3OUDS			942.00	938.56	99.6	70 - 130
D 62 d9-EtFOSE	125524	128358			102.3	50 - 150
33 EtFOSE			1000.00	1140.71	114.1	70 - 130
D 59 d5-EtFOSA	61517	59663			97	50 - 150
27 EtFOSA			1000.00	951.14	95.1	70 - 130
D 38 13C2_PFDoA	690580	694991			100.6	50 - 150
11 PFDoA			1000.00	1062.74	106.3	70 - 130
4 10:2 FTS			964.00	835.90	86.7	70 - 130
34 PFDOS			968.00	956.75	98.8	70 - 130
24 PFTrDA			1000.00	971.96	97.2	70 - 130
D 42 13C2_PFTeDA	788343	931935			118.2	50 - 150
23 PFTeDA			1000.00	930.33	93	70 - 130
D 40 13C2_PFHxDA	379801	418106			110.1	50 - 150
35 PFHxDA			1000.00	931.43	93.1	70 - 130
36 PFODA			1000.00	922.93	92.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A051.d
Injection Date: 04-Aug-2021 21:45:57 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 35
Sample Info: CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1055815	1020112			96.6	50 - 150
8 PFBA			1000.00	1023.38	102.3	70 - 130
21 PFPeA			1000.00	892.35	89.2	70 - 130
D 50 13C5_PFPeA	1049419	1038752			99	50 - 150
D 44 13C3_PFBS	314416	305577			97.2	50 - 150
7 PFBS			884.00	904.10	102.3	70 - 130
1 4:2 FTS			934.00	953.05	102	70 - 130
D 63 13C2_4:2 FTS_2	278992	299014			107.2	50 - 150
D 49 13C5_PFHxA	872566	915240			104.9	50 - 150
15 PFHxA			1000.00	883.00	88.3	70 - 130
22 PFPeS			938.00	933.87	99.6	70 - 130
28 GenX			2000.00	2189.25	109.5	70 - 130
D 66 13C3_GenX	611910	577771			94.4	50 - 150
D 47 13C4_PFHpA	933088	863058			92.5	50 - 150
13 PFHpA			1000.00	1029.20	102.9	70 - 130
D 45 13C3_PFHxS	254408	249882			98.2	50 - 150
14 PFHxS			910.00	853.87	93.8	70 - 130
29 ADONA			942.00	936.65	99.4	70 - 130
D 64 13C2_6:2 FTS_2	250534	241863			96.5	50 - 150
2 6:2 FTS			948.00	893.89	94.3	70 - 130
20 PFOA			1000.00	1034.11	103.4	70 - 130
D 53 13C8_PFOA	919907	889338			96.7	50 - 150
12 PFHpS			952.00	986.39	103.6	70 - 130
18 PFOS			928.00	796.50	85.8	70 - 130
D 54 13C8_PFOS	219295	253575			115.6	50 - 150
D 56 13C9_PFNA	904226	834139			92.2	50 - 150
17 PFNA			1000.00	1088.69	108.9	70 - 130
30 9Cl-PF3ONS			932.00	842.60	90.4	70 - 130
D 55 13C8_PFOSA	428055	451691			105.5	50 - 150
19 PFOSA			1000.00	901.82	90.2	70 - 130
16 PFNS			960.00	868.62	90.5	70 - 130
D 65 13C2_8:2 FTS_2	239459	240900			100.6	50 - 150
3 8:2 FTS			958.00	1020.66	106.5	70 - 130
D 51 13C6_PFDA	809951	964277			119.1	50 - 150
10 PFDA			1000.00	861.93	86.2	70 - 130
D 58 d3-MeFOSAA	1157951	1009333			87.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1065.81	106.6	70 - 130
9 PFDS			964.00	707.97	73.4	70 - 130
25 PFUdA			1000.00	881.16	88.1	70 - 130
D 60 d5-EtFOSAA	957645	1031672			107.7	50 - 150
D 52 13C7_PFUdA	726972	803752			110.6	50 - 150
5 N-EtFOSAA			1000.00	878.33	87.8	70 - 130
D 61 d7-MeFOSE	129289	137724			106.5	50 - 150
D 57 d3-MeFOSA	58022	65234			112.4	50 - 150
32 MeFOSE			1000.00	958.61	95.9	70 - 130
26 MeFOSA			1000.00	916.68	91.7	70 - 130
31 11Cl-PF3OUDS			942.00	852.81	90.5	70 - 130
D 62 d9-EtFOSE	125524	130820			104.2	50 - 150
33 EtFOSE			1000.00	1058.87	105.9	70 - 130
D 59 d5-EtFOSA	61517	56598			92	50 - 150
27 EtFOSA			1000.00	991.49	99.1	70 - 130
D 38 13C2_PFDoA	690580	685279			99.2	50 - 150
11 PFDoA			1000.00	1063.78	106.4	70 - 130
4 10:2 FTS			964.00	849.56	88.1	70 - 130
34 PFDOS			968.00	899.27	92.9	70 - 130
24 PFTrDA			1000.00	1121.00	112.1	70 - 130
D 42 13C2_PFTeDA	788343	832002			105.5	50 - 150
23 PFTeDA			1000.00	1063.10	106.3	70 - 130
D 40 13C2_PFHxDA	379801	406663			107.1	50 - 150
35 PFHxDA			1000.00	904.25	90.4	70 - 130
36 PFODA			1000.00	1053.65	105.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A063.d
Injection Date: 04-Aug-2021 23:53:07 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 46
Sample Info: CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1055815	850659			80.6	50 - 150
8 PFBA			1000.00	993.55	99.4	70 - 130
21 PFPeA			1000.00	991.45	99.1	70 - 130
D 50 13C5_PFPeA	1049419	872888			83.2	50 - 150
D 44 13C3_PFBS	314416	264306			84.1	50 - 150
7 PFBS			884.00	902.75	102.1	70 - 130
1 4:2 FTS			934.00	830.73	88.9	70 - 130
D 63 13C2_4:2 FTS_2	278992	275360			98.7	50 - 150
D 49 13C5_PFHxA	872566	746704			85.6	50 - 150
15 PFHxA			1000.00	934.71	93.5	70 - 130
22 PFPeS			938.00	931.93	99.4	70 - 130
28 GenX			2000.00	1946.61	97.3	70 - 130
D 66 13C3_GenX	611910	524164			85.7	50 - 150
D 47 13C4_PFHpA	933088	786243			84.3	50 - 150
13 PFHpA			1000.00	1011.28	101.1	70 - 130
D 45 13C3_PFHxS	254408	206428			81.1	50 - 150
14 PFHxS			910.00	875.82	96.2	70 - 130
29 ADONA			942.00	1011.28	107.4	70 - 130
D 64 13C2_6:2 FTS_2	250534	202400			80.8	50 - 150
2 6:2 FTS			948.00	903.15	95.3	70 - 130
20 PFOA			1000.00	964.25	96.4	70 - 130
D 53 13C8_PFOA	919907	780639			84.9	50 - 150
12 PFHpS			952.00	930.65	97.8	70 - 130
18 PFOS			928.00	990.21	106.7	70 - 130
D 54 13C8_PFOS	219295	184864			84.3	50 - 150
D 56 13C9_PFNA	904226	760176			84.1	50 - 150
17 PFNA			1000.00	951.83	95.2	70 - 130
30 9Cl-PF3ONS			932.00	898.64	96.4	70 - 130
D 55 13C8_PFOSA	428055	368891			86.2	50 - 150
19 PFOSA			1000.00	954.01	95.4	70 - 130
16 PFNS			960.00	1042.32	108.6	70 - 130
D 65 13C2_8:2 FTS_2	239459	216791			90.5	50 - 150
3 8:2 FTS			958.00	877.53	91.6	70 - 130
D 51 13C6_PFDA	809951	652308			80.5	50 - 150
10 PFDA			1000.00	1011.46	101.1	70 - 130
D 58 d3-MeFOSAA	1157951	845221			73	50 - 150

Report Date: 05-Aug-2021 13:49:35 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A063.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	934.85	93.5	70 - 130
9 PFDS			964.00	1142.39	118.5	70 - 130
25 PFUdA			1000.00	1034.07	103.4	70 - 130
D 60 d5-EtFOSAA	957645	843428			88.1	50 - 150
D 52 13C7_PFUdA	726972	600067			82.5	50 - 150
5 N-EtFOSAA			1000.00	857.19	85.7	70 - 130
D 61 d7-MeFOSE	129289	113788			88	50 - 150
D 57 d3-MeFOSA	58022	51111			88.1	50 - 150
32 MeFOSE			1000.00	1008.96	100.9	70 - 130
26 MeFOSA			1000.00	1068.71	106.9	70 - 130
31 11Cl-PF3OUDS			942.00	1014.31	107.7	70 - 130
D 62 d9-EtFOSE	125524	111806			89.1	50 - 150
33 EtFOSE			1000.00	1015.63	101.6	70 - 130
D 59 d5-EtFOSA	61517	40078			65.1	50 - 150
27 EtFOSA			1000.00	1073.97	107.4	70 - 130
D 38 13C2_PFDoA	690580	639763			92.6	50 - 150
11 PFDoA			1000.00	894.25	89.4	70 - 130
4 10:2 FTS			964.00	815.96	84.6	70 - 130
34 PFDOS			968.00	975.49	100.8	70 - 130
24 PFTrDA			1000.00	987.19	98.7	70 - 130
D 42 13C2_PFTeDA	788343	689089			87.4	50 - 150
23 PFTeDA			1000.00	1024.88	102.5	70 - 130
D 40 13C2_PFHxDA	379801	326662			86	50 - 150
35 PFHxDA			1000.00	956.45	95.6	70 - 130
36 PFODA			1000.00	1086.86	108.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A072.d
Injection Date: 05-Aug-2021 01:28:36 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 54
Sample Info: CCV 1000C_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1055815	891415			84.4	50 - 150
8 PFBA			1000.00	977.95	97.8	70 - 130
21 PFPeA			1000.00	918.11	91.8	70 - 130
D 50 13C5_PFPeA	1049419	904584			86.2	50 - 150
D 44 13C3_PFBS	314416	275272			87.6	50 - 150
7 PFBS			884.00	781.67	88.4	70 - 130
1 4:2 FTS			934.00	895.13	95.8	70 - 130
D 63 13C2_4:2 FTS_2	278992	247678			88.8	50 - 150
D 49 13C5_PFHxA	872566	700337			80.3	50 - 150
15 PFHxA			1000.00	1027.04	102.7	70 - 130
22 PFPeS			938.00	943.76	100.6	70 - 130
28 GenX			2000.00	1932.53	96.6	70 - 130
D 66 13C3_GenX	611910	573408			93.7	50 - 150
D 47 13C4_PFHpA	933088	782314			83.8	50 - 150
13 PFHpA			1000.00	1000.59	100.1	70 - 130
D 45 13C3_PFHxS	254408	198434			78	50 - 150
14 PFHxS			910.00	940.56	103.4	70 - 130
29 ADONA			942.00	982.06	104.3	70 - 130
D 64 13C2_6:2 FTS_2	250534	263043			105	50 - 150
2 6:2 FTS			948.00	786.55	83	70 - 130
20 PFOA			1000.00	913.78	91.4	70 - 130
D 53 13C8_PFOA	919907	809563			88	50 - 150
12 PFHpS			952.00	964.76	101.3	70 - 130
18 PFOS			928.00	897.49	96.7	70 - 130
D 54 13C8_PFOS	219295	185790			84.7	50 - 150
D 56 13C9_PFNA	904226	735859			81.4	50 - 150
17 PFNA			1000.00	1026.47	102.6	70 - 130
30 9Cl-PF3ONS			932.00	872.22	93.6	70 - 130
D 55 13C8_PFOSA	428055	318884			74.5	50 - 150
19 PFOSA			1000.00	1123.39	112.3	70 - 130
16 PFNS			960.00	1012.68	105.5	70 - 130
D 65 13C2_8:2 FTS_2	239459	225755			94.3	50 - 150
3 8:2 FTS			958.00	856.26	89.4	70 - 130
D 51 13C6_PFDA	809951	696785			86	50 - 150
10 PFDA			1000.00	935.89	93.6	70 - 130
D 58 d3-MeFOSAA	1157951	898648			77.6	50 - 150

Report Date: 05-Aug-2021 13:49:44 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A072.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1032.26	103.2	70 - 130
9 PFDS			964.00	1054.81	109.4	70 - 130
25 PFUdA			1000.00	832.82	83.3	70 - 130
D 60 d5-EtFOSAA	957645	886467			92.6	50 - 150
D 52 13C7_PFUdA	726972	687374			94.6	50 - 150
5 N-EtFOSAA			1000.00	885.79	88.6	70 - 130
D 61 d7-MeFOSE	129289	110360			85.4	50 - 150
D 57 d3-MeFOSA	58022	48476			83.5	50 - 150
32 MeFOSE			1000.00	949.38	94.9	70 - 130
26 MeFOSA			1000.00	1088.60	108.9	70 - 130
31 11Cl-PF3OUDS			942.00	1041.95	110.6	70 - 130
D 62 d9-EtFOSE	125524	118576			94.5	50 - 150
33 EtFOSE			1000.00	1059.94	106	70 - 130
D 59 d5-EtFOSA	61517	51178			83.2	50 - 150
27 EtFOSA			1000.00	884.56	88.5	70 - 130
D 38 13C2_PFDoA	690580	616366			89.3	50 - 150
11 PFDoA			1000.00	976.60	97.7	70 - 130
4 10:2 FTS			964.00	796.37	82.6	70 - 130
34 PFDOS			968.00	983.72	101.6	70 - 130
24 PFTrDA			1000.00	951.90	95.2	70 - 130
D 42 13C2_PFTeDA	788343	738624			93.7	50 - 150
23 PFTeDA			1000.00	1019.73	102	70 - 130
D 40 13C2_PFHxDA	379801	331372			87.2	50 - 150
35 PFHxDA			1000.00	910.30	91	70 - 130
36 PFODA			1000.00	1064.86	106.5	70 - 130

SCIEX

The Power of Precision

SCIEX Triple Quad™ 4500/4500MD Systems

Planned Maintenance Procedure



GEN-IDV-08-6710-E

October 2020

This document is provided to customers who have purchased SCIEX equipment to use in the operation of such SCIEX equipment. This document is copyright protected and any reproduction of this document or any part of this document is strictly prohibited, except as SCIEX may authorize in writing.

Software that may be described in this document is furnished under a license agreement. It is against the law to copy, modify, or distribute the software on any medium, except as specifically allowed in the license agreement. Furthermore, the license agreement may prohibit the software from being disassembled, reverse engineered, or decompiled for any purpose. Warranties are as stated therein.

Portions of this document may make reference to other manufacturers and/or their products, which may contain parts whose names are registered as trademarks and/or function as trademarks of their respective owners. Any such use is intended only to designate those manufacturers' products as supplied by SCIEX for incorporation into its equipment and does not imply any right and/or license to use or permit others to use such manufacturers' and/or their product names as trademarks.

SCIEX warranties are limited to those express warranties provided at the time of sale or license of its products and are the sole and exclusive representations, warranties, and obligations of SCIEX. SCIEX makes no other warranty of any kind whatsoever, expressed or implied, including without limitation, warranties of merchantability or fitness for a particular purpose, whether arising from a statute or otherwise in law or from a course of dealing or usage of trade, all of which are expressly disclaimed, and assumes no responsibility or contingent liability, including indirect or consequential damages, for any use by the purchaser or for any adverse circumstances arising therefrom.
(GEN-IDV-09-10816-C)

SCIEX Diagnostics products are for *in vitro* diagnostic use. Product(s) may not be available in all countries. For information on availability, please contact your local representative or refer to sciex.com. All other SCIEX products are for research use only. Not for use in diagnostic procedures.

Trademarks and/or registered trademarks mentioned herein, including associated logos, are the property of AB Sciex Pte. Ltd., or their respective owners, in the United States and/or certain other countries.

AB SCIEX™ is being used under license.

© 2020 DH Tech. Dev. Pte. Ltd.

EC REP

AB Sciex UK Limited
Phoenix House
Lakeside Drive, Centre Park
Warrington Cheshire
WA1 1RX, UK

AB Sciex Pte. Ltd.
Blk33, #04-06 Marsiling Industrial Estate Road 3
Woodlands Central Industrial Estate, Singapore 739256

Contents

1 Introduction....4

2 Planned Maintenance Tasks....5
Pre-Planned Maintenance....5
Pre-PM Tasks....5
PC Health Check....6
Vacuum System Tests....6
Pre-PM Pressure Test....7
Inspect for Contamination....7
Pre-PM System Tests....8
Planned Maintenance....13
Mass Spectrometer Maintenance....13
Turbo V™ Ion Source Maintenance....15
Software Maintenance....16
Post-Planned Maintenance....17
Voltage Tests....17
Post-PM Pressure Test....18
Inspect for Contamination....19
Post-PM System Tests....20
Post-PM Tasks....29
Wrap-up....31

3 Signoff....32
Comments and Exceptions....33

A Inspect for Contamination....34
Guidelines for Cleaning the Front End....34

Introduction 1

Note: For regulatory and safety information for the mass spectrometer, refer to the *System User Guide*.

The planned maintenance (PM) procedure is designed to help maintain overall system performance.

The PM is not intended to take the place of an Operational Qualification (OQ) nor is it intended to verify the instrument specifications. Separate Installation Qualification (IQ) and OQ services are available. Contact a SCIEX representative.

The procedure must be performed by a trained SCIEX Field Service Employee (FSE).

The procedure has been developed for the SCIEX Triple Quad™ 4500/4500MD System with the Turbo V™ Ion Source. It does not apply to any other products or processes.

The procedure does not address any customer-specific analytical protocol (performance qualification) or method validation.

Note: If an issue is identified and the system requires repair, then the customer is responsible for the repair at the expense of the customer, except to the extent that the system and the required repairs are covered by a SCIEX warranty or service contract. A separate repair service call must be opened and the repair hours must not be charged against this procedure.

Planned Maintenance Tasks 2

Note: Perform all procedures using the Turbo V™ Ion Source, unless otherwise specified.

Pre-Planned Maintenance

Note: Guideline values are for reference only. The pre-PM test results are not required to meet or exceed these values.

Pre-PM Tasks

Task	Complete	N/A
Ask the customer about system performance since the last visit and record comments.	✓	—
If the customer maintains a log for the system, then review it.	○	◉
Review the work to be performed with the customer.	✓	—

PC Health Check

Task	Complete	N/A
Inspect the status of the RAID 1 hard drives.	✓	—

Vacuum System Tests

Task			Complete
Record the turbo pump operational values. **Parameter** / **Results** Temperature (ºC) / 45 Current (A) / 3.9 Voltage (V) / 23 Power (W) / 87 Driving frequency (Hz) / 800			✓
Inspect the vacuum gauge filament using the Analyst® Service Diagnostics (ASD) Software and identify the filament position. If the mass spectrometer is using filament 2, then order a replacement vacuum gauge as a separate service call.	1	◉	✓
	2	○	

Pre-PM Pressure Test

Pre-PM Pressure Test is Complete	✓

Test	Guideline	Result
Vacuum chamber pressure with CAD gas off	0.4×10^{-5} torr $\leq P_{CAD\ 0} \leq 1.1 \times 10^{-5}$ torr	0.4e-5
Pressure difference (CAD_{12} minus CAD_0)	1.8×10^{-5} torr $\leq (P_{CAD\ 12} - P_{CAD\ 0}) \leq 2.8 \times 10^{-5}$ torr	2.3e-5

Inspect for Contamination

Task	Complete	N/A
Inspect for front-end contamination. Refer to Inspect for Contamination.	✓	—

Pre-PM System Tests

Q1 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	≥ 8.0×10^6	3.1e7	0.6 to 0.8	0.93
500.380	≥ 8.0×10^6	3.7e7	0.6 to 0.8	0.71
906.673	≥ 2.0×10^7	6.2e7	0.6 to 0.8	0.75
1,952.427	≥ 8.8×10^5	8.0e6	0.6 to 0.8	0.71

Q3 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	≥ 8.0×10^6	4.1e7	0.6 to 0.8	0.73
500.380	≥ 8.0×10^6	3.6e7	0.6 to 0.8	0.75
906.673	≥ 2.0×10^7	6.2e7	0.6 to 0.8	0.59
1,952.427	≥ 8.8×10^5	1.3e7	0.6 to 0.8	0.65

Q1 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
933.636	≥ 1.8×10^7	3.0e7	0.6 to 0.8	0.65
1,863.306	≥ 1.4×10^6	4.1e6	0.6 to 0.8	0.68

Q3 Negative MS Test is Complete	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
933.636	≥ 1.8×10^7	3.0e7	0.6 to 0.8	0.65
1,863.306	≥ 2.0×10^6	4.1e6	0.6 to 0.8	0.68

Reserpine MS/MS Transmission Test is Complete	✓

- **Test solution:** Reserpine solution 0.167 pmol/µL
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s (both MS and MS/MS)
- **Scan mode:** Product Ion (MS2)
- **Product Of:** 609.3 (or as calibrated)
- **Product Ion:** 195.1
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.

Guideline	**Result**
Transmission efficiency $\frac{Intensity\ for\ ion\ at\ m/z\ 195.1}{Intensity\ for\ ion\ at\ m/z\ 609.3\ (or\ as\ calibrated)} \times 100 \geq 10\%$	14%

Planned Maintenance

Mass Spectrometer Maintenance

Task	Complete	N/A
Shut down the system and then disconnect the mains supply power cable.	✓	—
If required, replace the roughing pump oil. The recommended interval is every 3 years. **Note:** If an oil change is not required, then inspect the oil level and top up, if necessary. **CAUTION: Potential System Damage. Do not mix different types of oil. Mixing mineral oil with synthetic oil can cause pump failure.**	✓	—
If required, replace the roughing pump oil exhaust filter. The recommended interval is every 3 years.	○	◒
Confirm that there is no excessive roughing pump oil leakage. Clean up any oil.	✓	—
Make sure that the roughing pump exhaust is properly routed to the ventilation system.	✓	—

Planned Maintenance Tasks

Task	Complete	N/A
Inspect the exhaust system: • Make sure that all of the gas fittings at the rear bulkhead are tight. • Make sure that all of the exhaust hoses are free of kinks. • Make sure that all of the hoses at the waste bottle are secure, and there are no signs of leaks. • Make sure that the waste bottle is in an upright position. • Make sure that the exhaust hose is secured to the lab ventilation system. • Confirm that no liquid is trapped in the exhaust lines.	✓	—
Clean or replace the four air filters in the base of the mass spectrometer chassis.	✓	—
(If applicable) Clean the turbo pump filter screen.	○	◉
(If applicable) Verify the operation of the SCIEX-supplied bench cooling fans.	◉	○
Clean the curtain plate.	✓	—
Clean the orifice plate.	✓	—
Clean the QJet® Ion Guide and IQ0 lens.	✓	—
(If contamination is detected) Clean the Q0 region and the IQ1 lens.	○	◉
Inspect the cable connections: • Make sure that the power cables for the mass spectrometer, LC system, roughing pump, syringe pump, gas generator, and UPS are securely connected. • Make sure that the communications cables for the GPIB/Ethernet ports, LC connections, and roughing pump are securely connected.	✓	—

Task	Complete	N/A
Verify system support functions — gas: • Confirm the input gas pressures at the regulators are within specifications. • Confirm that there is no liquid present in the gas lines.	✓	—
Verify the expiry date on the battery system for the UPS (sold by SCIEX), and then recommend replacement of the battery tray, if required.	○	◒
Start up the system.	✓	—

Turbo V™ Ion Source Maintenance

Task	Complete	N/A
If necessary, replace the electrode in the TurboIonSpray® and APCI Probes.	◒	○
With the TurboIonSpray® probe installed, verify that the temperature (TEM) reaches the recommended set point of 500 °C.	✓	—
(If applicable) With the APCI probe installed, verify that the temperature (TEM) reaches the recommended set point of 400 °C.	○	◒
Inspect the ion source and, if visible signs of contamination are present, clean the inner surfaces using lint-free wipes and a 50:50 methanol:water solution. **Note:** Remove the corona discharge needle before cleaning.	○	◒

Software Maintenance

Note: This task is not applicable to MD systems.

Task	Complete	N/A
(Obtain customer approval first) Install any applicable Analyst® Software HotFixes. **Note:** Make sure that the compatible instrument firmware is installed.	○	◉

Post-Planned Maintenance

Voltage Tests

Task		Complete
Inspect the RF tuning voltages at the QPS amplifier module and then, if required, tune the coil boxes.		✓
Inspect the detector voltage. Optimize, if required.		✓
Detector voltage	1800	

Post-PM Pressure Test

Post-PM Pressure Test is Complete	✓

Test	Specification	Result
Vacuum chamber pressure with CAD gas off	0.4×10^{-5} torr $\leq P_{CAD\ 0} \leq 1.1 \times 10^{-5}$ torr	0.6e-5
Pressure difference (CAD_{12} minus CAD_0)	1.8×10^{-5} torr $\leq (P_{CAD\ 12} - P_{CAD\ 0}) \leq 2.8 \times 10^{-5}$ torr	2.3e-5

Inspect for Contamination

Task	Complete	N/A
Inspect for front-end contamination. Refer to Inspect for Contamination.	✓	—

Post-PM System Tests

Q1 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
175.133	≥ 8.0×10^6	2.9e7	0.6 to 0.8	0.73
500.380	≥ 8.0×10^6	3.2e7	0.6 to 0.8	0.72
906.673	≥ 2.0×10^7	4.8e7	0.6 to 0.8	0.72
1,952.427	≥ 8.8×10^5	5.5e6	0.6 to 0.8	0.60

Q1 Positive MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q3 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
175.133	≥ 8.0×10^6	3.5e7	0.6 to 0.8	0.75
500.380	≥ 8.0×10^6	2.9e7	0.6 to 0.8	0.75
906.673	≥ 2.0×10^7	5.0e7	0.6 to 0.8	0.62
1,952.427	≥ 8.8×10^5	9.6e6	0.6 to 0.8	0.64

Q3 Positive MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q1 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
933.636	≥ 1.8×10^7	2.9e7	0.6 to 0.8	0.64
1,863.306	≥ 1.4×10^6	5.3e6	0.6 to 0.8	0.70

Q1 Negative MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q3 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
933.636	≥ 1.8×10^7	3.6e7	0.6 to 0.8	0.69
1,863.306	≥ 2.0×10^6	5.4e6	0.6 to 0.8	0.73

Q3 Negative MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Reserpine MS/MS Transmission Test is Complete	✓

- **Test solution:** Reserpine solution 0.167 pmol/µL
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s (both MS and MS/MS)
- **Scan mode:** Product Ion (MS2)
- **Product Of:** 609.3 (or as calibrated)
- **Product Ion:** 195.1
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.

Specification	**Result**
Transmission efficiency $\frac{Intensity\ for\ ion\ at\ m/z\ 195.1}{Intensity\ for\ ion\ at\ m/z\ 609.3\ (or\ as\ calibrated)} \times 100 \geq 10\%$	11.8%

Post-PM Tasks

Task	Complete	N/A
Delete any unnecessary files.	✓	—
Back up the Analyst Data folder.	✓	—
(If applicable) Defragment the hard drive.	○	◉
(Not applicable for MD instrument families) If the customer has a Software Support Plan, then perform the Software Health Check: • (Obtain customer approval first) Install any compatible HotFixes and updates for SCIEX add-on software.	○	◉

StatusScope® Remote Monitoring Service Tasks

The StatusScope® Remote Monitoring Service is not applicable for MD systems.

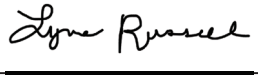
Planned Maintenance Tasks

Task	Complete	N/A
Note: Installation of the StatusScope® Remote Monitoring Service is available only to warranty and eligible contract customers. Refer to sciex.com/instrument-service-and-support/statusscope-remote-monitoring for a list of eligible contracts. If the StatusScope® Remote Monitoring Service is not installed, then perform these tasks: • If the customer does not want the StatusScope® Remote Monitoring Service installed, then skip the remaining steps in this section. • If the customer wants the StatusScope® Remote Monitoring Service installed, then complete the steps in this section.	○	◉
Verify the connection to the server for the StatusScope® Remote Monitoring Service. **Note:** Use the **StatusScopePortCheck.exe**. The utility is included with the StatusScope® installer.	○	◉
Install the agent for the StatusScope® Remote Monitoring Service.	○	◉
Ask the customer to log on to SCIEX Now™ to verify that the instrument is connected to the server for the StatusScope® Remote Monitoring Service. **Note:** The instrument is shown under the account of the Primary Contact.	○	◉

Wrap-up

Task	Complete	N/A
Review the work performed with the customer.	✓	—
Record the test results in this document and then attach all of the test data.	✓	—
Review the routine maintenance schedule and the procedures with the customer.	✓	—
Complete this document: • Review the test results with the customer. • Provide the customer with the completed document and the test data. • If an electronic copy of the document is supplied to the customer, then save a copy on the Service drive.	✓	—

Signoff 3

Organization	Pace South Carolina		
Mass spectrometer serial number	BJ29321608	Service request number	
FSE name	Lynne Russell	Date (yyyy-mm-dd)	2021-03-17
FSE signature			

Comments and Exceptions

Inspect for Contamination A

Perform a Q1 and Q3 charging test to determine whether front end contamination is present.

1. Run the **Pos PPG** method for 10 minutes, monitoring the Total Ion Count (TIC) for degradation of the signal or a decrease in sensitivity.
2. Change the polarity to Negative, and then scan for one minute.
3. Change the polarity to Positive, and then make sure that the **IS** parameter returns to the original value.
4. Run the method.

   If the signal sensitivity is restored temporarily but the Total Ion Count (TIC) again degrades by more than 5% over a 10 minute run, then a possible front-end contamination is indicated.
5. Repeat the test in Negative polarity using the Q1 Neg PPG method.

Guidelines for Cleaning the Front End

If charging tests indicate that cleaning is necessary, then clean the front-end components, including the QJet® Ion Guide, IQ0 lens, Q0 quadrupole, and IQ1 lens.

Removing the ion optics is considered a repair activity. FSEs must open a separate service repair call.

Note: This procedure does not provide troubleshooting for all technical root causes of signal degradation or charging effect. Signal degradation might also result from a contaminated TurboIonSpray® Probe or electrode, method parameters that are not optimized, or other factors.

SCIEX
The Power of Precision

SCIEX Triple Quad™ 4500/4500MD Systems

Planned Maintenance Procedure



GEN-IDV-08-6710-E

October 2020

This document is provided to customers who have purchased SCIEX equipment to use in the operation of such SCIEX equipment. This document is copyright protected and any reproduction of this document or any part of this document is strictly prohibited, except as SCIEX may authorize in writing.

Software that may be described in this document is furnished under a license agreement. It is against the law to copy, modify, or distribute the software on any medium, except as specifically allowed in the license agreement. Furthermore, the license agreement may prohibit the software from being disassembled, reverse engineered, or decompiled for any purpose. Warranties are as stated therein.

Portions of this document may make reference to other manufacturers and/or their products, which may contain parts whose names are registered as trademarks and/or function as trademarks of their respective owners. Any such use is intended only to designate those manufacturers' products as supplied by SCIEX for incorporation into its equipment and does not imply any right and/or license to use or permit others to use such manufacturers' and/or their product names as trademarks.

SCIEX warranties are limited to those express warranties provided at the time of sale or license of its products and are the sole and exclusive representations, warranties, and obligations of SCIEX. SCIEX makes no other warranty of any kind whatsoever, expressed or implied, including without limitation, warranties of merchantability or fitness for a particular purpose, whether arising from a statute or otherwise in law or from a course of dealing or usage of trade, all of which are expressly disclaimed, and assumes no responsibility or contingent liability, including indirect or consequential damages, for any use by the purchaser or for any adverse circumstances arising therefrom.
(GEN-IDV-09-10816-C)

SCIEX Diagnostics products are for *in vitro* diagnostic use. Product(s) may not be available in all countries. For information on availability, please contact your local representative or refer to sciex.com. All other SCIEX products are for research use only. Not for use in diagnostic procedures.

Trademarks and/or registered trademarks mentioned herein, including associated logos, are the property of AB Sciex Pte. Ltd., or their respective owners, in the United States and/or certain other countries.

AB SCIEX™ is being used under license.

© 2020 DH Tech. Dev. Pte. Ltd.

EC REP

AB Sciex UK Limited
Phoenix House
Lakeside Drive, Centre Park
Warrington Cheshire
WA1 1RX, UK

AB Sciex Pte. Ltd.
Blk33, #04-06 Marsiling Industrial Estate Road 3
Woodlands Central Industrial Estate, Singapore 739256

Contents

1 Introduction....4

2 Planned Maintenance Tasks....5
Pre-Planned Maintenance....5
Pre-PM Tasks....5
PC Health Check....6
Vacuum System Tests....6
Pre-PM Pressure Test....7
Inspect for Contamination....7
Pre-PM System Tests....8
Planned Maintenance....13
Mass Spectrometer Maintenance....13
Turbo V™ Ion Source Maintenance....15
Software Maintenance....16
Post-Planned Maintenance....17
Voltage Tests....17
Post-PM Pressure Test....18
Inspect for Contamination....19
Post-PM System Tests....20
Post-PM Tasks....29
Wrap-up....31

3 Signoff....32
Comments and Exceptions....33

A Inspect for Contamination....34
Guidelines for Cleaning the Front End....34

Introduction 1

Note: For regulatory and safety information for the mass spectrometer, refer to the *System User Guide*.

The planned maintenance (PM) procedure is designed to help maintain overall system performance.

The PM is not intended to take the place of an Operational Qualification (OQ) nor is it intended to verify the instrument specifications. Separate Installation Qualification (IQ) and OQ services are available. Contact a SCIEX representative.

The procedure must be performed by a trained SCIEX Field Service Employee (FSE).

The procedure has been developed for the SCIEX Triple Quad™ 4500/4500MD System with the Turbo V™ Ion Source. It does not apply to any other products or processes.

The procedure does not address any customer-specific analytical protocol (performance qualification) or method validation.

Note: If an issue is identified and the system requires repair, then the customer is responsible for the repair at the expense of the customer, except to the extent that the system and the required repairs are covered by a SCIEX warranty or service contract. A separate repair service call must be opened and the repair hours must not be charged against this procedure.

Planned Maintenance Tasks 2

Note: Perform all procedures using the Turbo V™ Ion Source, unless otherwise specified.

Pre-Planned Maintenance

Note: Guideline values are for reference only. The pre-PM test results are not required to meet or exceed these values.

Pre-PM Tasks

Task	Complete	N/A
Ask the customer about system performance since the last visit and record comments.	✓	—
If the customer maintains a log for the system, then review it.	○	◉
Review the work to be performed with the customer.	✓	—

PC Health Check

Task	Complete	N/A
Inspect the status of the RAID 1 hard drives.		—

Vacuum System Tests

Task			Complete
Record the turbo pump operational values. **Parameter** / **Results** Temperature (ºC) — see notes Current (A) — see notes Voltage (V) — see notes Power (W) — see notes Driving frequency (Hz) — see notes			
Inspect the vacuum gauge filament using the Analyst® Service Diagnostics (ASD) Software and identify the filament position. If the mass spectrometer is using filament 2, then order a replacement vacuum gauge as a separate service call.	1	○	
	2	○	

Pre-PM Pressure Test

Pre-PM Pressure Test is Complete	✓

Test	Guideline	Result
Vacuum chamber pressure with CAD gas off	0.4×10^{-5} torr $\leq P_{CAD\ 0} \leq 1.1 \times 10^{-5}$ torr	0.4e-5
Pressure difference (CAD_{12} minus CAD_0)	1.8×10^{-5} torr $\leq (P_{CAD\ 12} - P_{CAD\ 0}) \leq 2.8 \times 10^{-5}$ torr	2.1e-5

Inspect for Contamination

Task	Complete	N/A
Inspect for front-end contamination. Refer to Inspect for Contamination.	✓	—

Pre-PM System Tests

Q1 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	≥ 8.0×10^6	2.5e7	0.6 to 0.8	0.87
500.380	≥ 8.0×10^6	2.4e7	0.6 to 0.8	0.81
906.673	≥ 2.0×10^7	3.9e7	0.6 to 0.8	0.79
1,952.427	≥ 8.8×10^5	7.7e6	0.6 to 0.8	1.1

Q3 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
175.133	≥ 8.0×10^6	3.0e7	0.6 to 0.8	0.75
500.380	≥ 8.0×10^6	2.7e7	0.6 to 0.8	0.81
906.673	≥ 2.0×10^7	4.7e7	0.6 to 0.8	0.78
1,952.427	≥ 8.8×10^5	7.8e6	0.6 to 0.8	0.85

Q1 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
933.636	≥ 1.8×10^7	2.4e7	0.6 to 0.8	0.65
1,863.306	≥ 1.4×10^6	3.7e6	0.6 to 0.8	0.73

Q3 Negative MS Test is Complete	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Guideline	Result	Guideline	Result
933.636	≥ 1.8×10^7	3.1e7	0.6 to 0.8	0.79
1,863.306	≥ 2.0×10^6	6.2e6	0.6 to 0.8	0.76

Reserpine MS/MS Transmission Test is Complete	✓

- **Test solution:** Reserpine solution 0.167 pmol/µL
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s (both MS and MS/MS)
- **Scan mode:** Product Ion (MS2)
- **Product Of:** 609.3 (or as calibrated)
- **Product Ion:** 195.1
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.

Guideline	**Result**
Transmission efficiency $\frac{Intensity\ for\ ion\ at\ m/z\ 195.1}{Intensity\ for\ ion\ at\ m/z\ 609.3\ (or\ as\ calibrated)} \times 100 \geq 10\%$	6.6%

Planned Maintenance

Mass Spectrometer Maintenance

Task	Complete	N/A
Shut down the system and then disconnect the mains supply power cable.	✓	—
If required, replace the roughing pump oil. The recommended interval is every 3 years. **Note:** If an oil change is not required, then inspect the oil level and top up, if necessary. **CAUTION: Potential System Damage. Do not mix different types of oil. Mixing mineral oil with synthetic oil can cause pump failure.**	✓	—
If required, replace the roughing pump oil exhaust filter. The recommended interval is every 3 years.	◉	○
Confirm that there is no excessive roughing pump oil leakage. Clean up any oil.		—
Make sure that the roughing pump exhaust is properly routed to the ventilation system.	✓	—

Planned Maintenance Tasks

Task	Complete	N/A
Inspect the exhaust system: • Make sure that all of the gas fittings at the rear bulkhead are tight. • Make sure that all of the exhaust hoses are free of kinks. • Make sure that all of the hoses at the waste bottle are secure, and there are no signs of leaks. • Make sure that the waste bottle is in an upright position. • Make sure that the exhaust hose is secured to the lab ventilation system. • Confirm that no liquid is trapped in the exhaust lines.	✓	—
Clean or replace the four air filters in the base of the mass spectrometer chassis.	✓	—
(If applicable) Clean the turbo pump filter screen.	○	◉
(If applicable) Verify the operation of the SCIEX-supplied bench cooling fans.	◉	○
Clean the curtain plate.	✓	—
Clean the orifice plate.	✓	—
Clean the QJet® Ion Guide and IQ0 lens.	✓	—
(If contamination is detected) Clean the Q0 region and the IQ1 lens.	◉	○
Inspect the cable connections: • Make sure that the power cables for the mass spectrometer, LC system, roughing pump, syringe pump, gas generator, and UPS are securely connected. • Make sure that the communications cables for the GPIB/Ethernet ports, LC connections, and roughing pump are securely connected.	✓	—

Task	Complete	N/A
Verify system support functions — gas: • Confirm the input gas pressures at the regulators are within specifications. • Confirm that there is no liquid present in the gas lines.	✓	—
Verify the expiry date on the battery system for the UPS (sold by SCIEX), and then recommend replacement of the battery tray, if required.	○	◒
Start up the system.	✓	—

Turbo V™ Ion Source Maintenance

Task	Complete	N/A
If necessary, replace the electrode in the TurboIonSpray® and APCI Probes.	◒	○
With the TurboIonSpray® probe installed, verify that the temperature (TEM) reaches the recommended set point of 500 °C.	✓	—
(If applicable) With the APCI probe installed, verify that the temperature (TEM) reaches the recommended set point of 400 °C.	○	◒
Inspect the ion source and, if visible signs of contamination are present, clean the inner surfaces using lint-free wipes and a 50:50 methanol:water solution. **Note:** Remove the corona discharge needle before cleaning.	◒	○

Software Maintenance

Note: This task is not applicable to MD systems.

Task	Complete	N/A
(Obtain customer approval first) Install any applicable Analyst® Software HotFixes. **Note:** Make sure that the compatible instrument firmware is installed.	○	◉

Post-Planned Maintenance

Voltage Tests

Task		Complete
Inspect the RF tuning voltages at the QPS amplifier module and then, if required, tune the coil boxes.		✓
Inspect the detector voltage. Optimize, if required.		✓
Detector voltage	2100	

Post-PM Pressure Test

Post-PM Pressure Test is Complete	✓

Test	Specification	Result
Vacuum chamber pressure with CAD gas off	0.4×10^{-5} torr $\leq P_{CAD\ 0} \leq 1.1 \times 10^{-5}$ torr	0.8e-5
Pressure difference (CAD_{12} minus CAD_0)	1.8×10^{-5} torr $\leq (P_{CAD\ 12} - P_{CAD\ 0}) \leq 2.8 \times 10^{-5}$ torr	2.5e-5

Inspect for Contamination

Task	Complete	N/A
Inspect for front-end contamination. Refer to Inspect for Contamination.	✓	—

Post-PM System Tests

Q1 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
175.133	≥ 8.0×10^6	2.1e7	0.6 to 0.8	0.73
500.380	≥ 8.0×10^6	2.8e7	0.6 to 0.8	0.70
906.673	≥ 2.0×10^7	3.8e7	0.6 to 0.8	0.73
1,952.427	≥ 8.8×10^5	6.0e6	0.6 to 0.8	0.69

Q1 Positive MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q3 Positive MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
175.133	≥ 8.0×10^6	2.8e7	0.6 to 0.8	0.73
500.380	≥ 8.0×10^6	3.1e7	0.6 to 0.8	0.70
906.673	≥ 2.0×10^7	4.6e7	0.6 to 0.8	0.69
1,952.427	≥ 8.8×10^5	5.5e6	0.6 to 0.8	0.69

Q3 Positive MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** POS PPG, 2e-6 M
- **Flow rate:** 5 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
59.050, 175.133, 500.380, 616.464, 906.673, 1,254.925, 1,545.134, 1,952.427	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q1 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
933.636	≥ 1.8×10^7	2.6e7	0.6 to 0.8	0.70
1,863.306	≥ 1.4×10^6	4.3e6	0.6 to 0.8	0.71

Q1 Negative MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Q3 Negative MS Test is Complete: Intensity and Peak Width	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **Scan rate**: 10 Da/s
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Intensity (cps)		Peak Width (Da)	
	Specification	Result	Specification	Result
933.636	≥ 1.8×10^7	3.4e7	0.6 to 0.8	0.77
1,863.306	≥ 2.0×10^6	5.6e6	0.6 to 0.8	0.72

Q3 Negative MS Test is Complete: Peak Width for Identified Masses	✓

- **Test solution:** NEG PPG, 3e-4 M
- **Flow rate:** 10 µL/min
- **MCA:** On
- **Printouts required:** Spectra for masses 44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389, with peak intensities, peak width, and mass shift results, complete with method file information.

Note: After calibration, the mass shift result must be within 0.1 Da for all assigned masses.

Mass (Da)	Scan Rate (Da/s)	Cycles	Specification (Da)	Result (Passed)
44.998, 411.259, 585.385, 933.636, 1,223.845, 1,572.097, 1,863.306, 1,979.389	10	10	0.6 to 0.8	✓
	200	50	0.6 to 0.8	
	1,000	50	0.6 to 0.8	
	2,000	100	0.6 to 0.8	

Reserpine MS/MS Transmission Test is Complete	✓

- **Test solution:** Reserpine solution 0.167 pmol/µL
- **Flow rate:** 5 µL/min
- **Scan rate:** 10 Da/s (both MS and MS/MS)
- **Scan mode:** Product Ion (MS2)
- **Product Of:** 609.3 (or as calibrated)
- **Product Ion:** 195.1
- **Cycles:** 10
- **MCA:** On
- **Printouts required:** Spectra for masses 609.3 and 195.1, with peak intensities, peak width, and mass shift results, complete with method file information.

Specification	**Result**
Transmission efficiency $\frac{Intensity\ for\ ion\ at\ m/z\ 195.1}{Intensity\ for\ ion\ at\ m/z\ 609.3\ (or\ as\ calibrated)} \times 100 \geq 10\%$	11%

Post-PM Tasks

Task	Complete	N/A
Delete any unnecessary files.	✓	—
Back up the Analyst Data folder.	✓	—
(If applicable) Defragment the hard drive.	○	◉
(Not applicable for MD instrument families) If the customer has a Software Support Plan, then perform the Software Health Check: • (Obtain customer approval first) Install any compatible HotFixes and updates for SCIEX add-on software.	○	◉

StatusScope® Remote Monitoring Service Tasks

The StatusScope® Remote Monitoring Service is not applicable for MD systems.

Planned Maintenance Tasks

Task	Complete	N/A
Note: Installation of the StatusScope® Remote Monitoring Service is available only to warranty and eligible contract customers. Refer to sciex.com/instrument-service-and-support/statusscope-remote-monitoring for a list of eligible contracts. If the StatusScope® Remote Monitoring Service is not installed, then perform these tasks: • If the customer does not want the StatusScope® Remote Monitoring Service installed, then skip the remaining steps in this section. • If the customer wants the StatusScope® Remote Monitoring Service installed, then complete the steps in this section.	○	◉
Verify the connection to the server for the StatusScope® Remote Monitoring Service. **Note:** Use the **StatusScopePortCheck.exe**. The utility is included with the StatusScope® installer.	○	◉
Install the agent for the StatusScope® Remote Monitoring Service.	○	◉
Ask the customer to log on to SCIEX Now™ to verify that the instrument is connected to the server for the StatusScope® Remote Monitoring Service. **Note:** The instrument is shown under the account of the Primary Contact.	○	◉

Wrap-up

Task	Complete	N/A
Review the work performed with the customer.	✓	—
Record the test results in this document and then attach all of the test data.	✓	—
Review the routine maintenance schedule and the procedures with the customer.	✓	—
Complete this document: • Review the test results with the customer. • Provide the customer with the completed document and the test data. • If an electronic copy of the document is supplied to the customer, then save a copy on the Service drive.	✓	—

Signoff 3

Organization	Pace South Carolina		
Mass spectrometer serial number	EB250231807	Service request number	5030888
FSE name	Lynne Russell	Date (yyyy-mm-dd)	2021-03-25
FSE signature			

Comments and Exceptions

Unable to check RAID and perform vacuum system test because I did not have admin privileges on the customer computer. LER 25MAR2021

Inspect for Contamination A

Perform a Q1 and Q3 charging test to determine whether front end contamination is present.

1. Run the **Pos PPG** method for 10 minutes, monitoring the Total Ion Count (TIC) for degradation of the signal or a decrease in sensitivity.
2. Change the polarity to Negative, and then scan for one minute.
3. Change the polarity to Positive, and then make sure that the **IS** parameter returns to the original value.
4. Run the method.

   If the signal sensitivity is restored temporarily but the Total Ion Count (TIC) again degrades by more than 5% over a 10 minute run, then a possible front-end contamination is indicated.
5. Repeat the test in Negative polarity using the Q1 Neg PPG method.

Guidelines for Cleaning the Front End

If charging tests indicate that cleaning is necessary, then clean the front-end components, including the QJet® Ion Guide, IQ0 lens, Q0 quadrupole, and IQ1 lens.

Removing the ion optics is considered a repair activity. FSEs must open a separate service repair call.

Note: This procedure does not provide troubleshooting for all technical root causes of signal degradation or charging effect. Signal degradation might also result from a contaminated TurboIonSpray® Probe or electrode, method parameters that are not optimized, or other factors.

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A028.d		
Injection Date:	04-Aug-2021 17:42:36	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	13
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	1	1069816	20	>100:1			1001.00	1026.54	101.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.714		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	1017807	16	>100:1			1001.00	1003.08	97	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.068		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	1	320690	16	>100:1			1001.00	1034.24	102	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.120		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.476		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	1	319066	16	>100:1			5005.00	5539.62	114.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.398		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	1	924244	18	>100:1			1001.00	1039.72	105.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.441		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	634352	18	>100:1			5005.00	5010.89	103.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.563		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.820	2.819	1	946627	18	>100:1			1001.00	1035.91	101.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.819		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.828	2.837	0	261436	18	>100:1			1001.00	1054.98	102.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.837		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.863		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.210		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.172	3.179	0	275222	23	>100:1			5005.00	5484.97	109.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.179		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.198	3.204	0	933234	22	>100:1			1001.00	1028.44	101.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.204		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.565	3.573	0	199798	20	>100:1			1001.00	897.32	91.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.573		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.775		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.908		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.208		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.365		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.706		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.573	3.573	1	888572	19	>100:1			1001.00	1025.76	98.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.580		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	1	444671	18	>100:1			1001.00	1038.90	103.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.856		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	1	303632	18	>100:1			5005.00	6731.73	126.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.916		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.505		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.916	1	787817	18	>100:1			1001.00	1027.72	97.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.923		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.069	1	1188739	17	>100:1			5005.00	5866.99	102.7	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.077		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.225	1	820374	16	>100:1			1001.00	1157.58	112.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.225		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.225	1	1234907	17	>100:1			5005.00	6854.92	129	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.235		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.263	4.272	0	139763	16	>100:1			1001.00	1029.38	108.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.282		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.282	4.282	1	67636	13	>100:1			1001.00	1124.15	116.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.291		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.429	4.428	1	155679	16	>100:1			1001.00	1185.82	124	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.442		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.449	4.449	1	66001	16	>100:1			1001.00	1124.59	107.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.456		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.488	4.488	1	846794	17	>100:1			1001.00	1197.41	122.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.496		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.737		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.956	4.948	1	899045	16	>100:1			1001.00	1047.81	114	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.956		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.338	5.338	1	458304	17	>100:1			1001.00	1201.40	120.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.347	1/0	8979	14	18:1	Target = 12.75		11.322	11.322		
813 > 269	40	5.338	5.347		727	19	18:1	12.35 (6.37-19.12)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.722		ND								
*** 37 13C2_PFDA**													
515 > 470		3.916	3.916	1	741033	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	1	828942	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.204	3.198	1	918584	23	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.708	1.714	0	1049230	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.573	3.573	1	256395	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072821-DOD.b\072821007.d		
Injection Date:	28-Jul-2021 12:58:02	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.712	1	514911	20	>100:1			1001.00	933.83	94.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.712		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.094	2.088	1	486224	16	>100:1			1001.00	941.68	96.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.146	2.141	1	169243	15	>100:1			1001.00	975.09	94.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.141		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.487		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.416	0	94842	17	>100:1			5005.00	4757.36	100.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.459	2.451	1	558806	17	>100:1			1001.00	926.60	88.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.451		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.574	2.567	1	1168151	18	>100:1			5005.00	5485.03	98.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.575		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.827	0	483025	17	>100:1			1001.00	995.96	100.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.827		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.844	2.846	0	145808	24				1001.00	1049.87	99.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.846		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.864		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.213		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.185	3.187	0	85628	21	>100:1			5005.00	5460.01	103.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.187		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.211	3.213	0	468013	21	>100:1			1001.00	945.93	99.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.207		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.584	0	139485	18	>100:1			1001.00	1001.51	96.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.584		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.796		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.935		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.235		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.396		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.747		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.590	3.592	0	593988	18	>100:1			1001.00	975.04	100.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.592		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.884	3.885	0	303074	17	>100:1			1001.00	1135.20	98.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.885		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.942	3.935	1	81236	19				5005.00	4799.45	88.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.935		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.542		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.942	3.943	0	514081	17	>100:1			1001.00	871.54	84.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.943		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.102	4.105	0	708877	17	>100:1			5005.00	5310.56	103.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.114		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.252	4.255	0	566843	16				1001.00	862.94	91.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.255		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.262	4.255	1	617640	15	>100:1			5005.00	5374.04	96.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.265		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.312	4.306	1	91688	14	>100:1			1001.00	1220.59	111.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.326		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.333	4.336	0	53403	16	>100:1			1001.00	1085.48	109.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.336		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.477	4.479	0	100333	14	>100:1			1001.00	1281.73	109.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.488		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.495	4.497	0	51189	15	>100:1			1001.00	1232.10	111.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.506		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.531	4.533	0	572892	16	>100:1			1001.00	771.65	90.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.533		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.774		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.995	4.991	1	761042	19	>100:1			1001.00	869.74	95.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.991		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.385	5.387	0	912191	17	>100:1			1001.00	1089.73	96.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.385	5.387	0/0	5682	23	26:1	Target = 10.45		10.435	10.435		
813 > 269	40	5.376	5.387		388	19	20:1	14.64 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.766		ND								
*** 37 13C2_PFDA**													
515 > 470		3.942	3.943	0	622792	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.451	1	541240	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.211	3.213	0	488278	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.715	1.712	1	454334	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.584	0	140885	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\072921-DOD.b\072921007.d		
Injection Date:	29-Jul-2021 12:40:08	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.717	1	543164	20	>100:1			1001.00	985.07	95.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.717		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.098	0	527668	16	>100:1			1001.00	1021.94	101.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.098		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.152	2.150	1	178586	15	>100:1			1001.00	1028.92	104.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.150		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.504		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.425	2.424	1	105529	17	>100:1			5005.00	5293.43	103.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.424		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.461	2.459	1	542282	17	>100:1			1001.00	899.20	91.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.468		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.576	2.582	0	1168493	18	>100:1			5005.00	5486.63	95.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.582		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.837	2.835	1	502392	18	>100:1			1001.00	1035.89	103.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.835		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.854	0	143921	17	>100:1			1001.00	1036.28	93.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.863		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.880		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.225		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.194	3.192	1	82324	23				5005.00	5249.33	97.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.198		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.220	3.225	0	484052	21	>100:1			1001.00	978.35	97.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.218		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.600	3.598	1	143114	19	>100:1			1001.00	1027.56	100.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.598		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.803		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.942		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.252		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.408		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.759		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.608	3.606	1	594089	19	>100:1			1001.00	975.21	92	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.606		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.894	3.885	1	303882	17				1001.00	1138.22	90.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.893		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.944	3.942	1	90670	16				5005.00	5356.82	92.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.951		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.557		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.953	3.951	1	562081	17	>100:1			1001.00	952.91	88.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.960		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.114	4.111	1	693729	16	>100:1			5005.00	5197.08	104.1	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.111		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.266	4.262	1	606203	16	>100:1			1001.00	922.86	89.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.262		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.276	4.272	1	586969	15	>100:1			5005.00	5107.18	92.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.272		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.316	4.313	1	89401	15	>100:1			1001.00	1190.14	99.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.323		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.336	4.333	1	58773	13	>100:1			1001.00	1194.63	103.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.342		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.480	4.477	1	92432	13	>100:1			1001.00	1180.80	90.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.495		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.498	4.495	1	46259	15	>100:1			1001.00	1113.44	100.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.513		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.543	4.539	1	633223	16	>100:1			1001.00	852.91	97.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.539		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.786		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.003	5.002	1	776357	20	>100:1			1001.00	887.24	99.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		5.008		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.395	5.403	0	887860	18	>100:1			1001.00	1060.66	99.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.395	5.403	0/0	4943	15	29:1	Target = 10.45		9.3264	9.3264		
813 > 269	40	5.387	5.403		543	18	21:1	9.10 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.786		ND								
*** 37 13C2_PFDA**													
515 > 470		3.953	3.960	0	544498	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.461	2.468	0	514093	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.227	3.225	1	490021	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.718	1.717	1	447158	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.600	3.598	1	135953	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\073021-DOD.b\073021007.d		
Injection Date:	30-Jul-2021 13:13:51	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.717	1.717	0	517353	22	>100:1			1001.00	938.26	92.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.723		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.097	2.098	0	497542	15	>100:1			1001.00	963.60	89.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.098		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.150	2.150	0	176244	15	>100:1			1001.00	1015.43	93.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.150		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.495		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.423	2.424	0	91723	17	>100:1			5005.00	4600.91	93.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.424		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.468	2.459	1	574961	17	>100:1			1001.00	953.39	94.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.468		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.574	2.574	0	1187884	18	>100:1			5005.00	5577.68	97.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.582		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.835	2.835	0	480417	18	>100:1			1001.00	990.58	97	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.844		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.853	2.854	0	148459	19	>100:1			1001.00	1068.96	100.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.854		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.872		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.225		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.198	3.198	0	84938	22	>100:1			5005.00	5416.01	95.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.198		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.218	3.225	0	485733	21	>100:1			1001.00	981.75	93.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.225		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.598	3.598	0	139902	20	>100:1			1001.00	1004.50	91.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.598		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.803		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.942		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.252		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.408		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.751		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.598	3.606	0	627810	19	>100:1			1001.00	1030.56	94	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.606		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.892	3.893	0	292376	19	>100:1			1001.00	1095.13	89.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.893		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.942	3.951	0	88203	17	>100:1			5005.00	5211.06	92.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.934		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.548		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.951	3.951	0	601746	18	>100:1			1001.00	1020.16	94.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.960		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.111	4.111	0	679421	17	>100:1			5005.00	5089.89	96.8	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.111		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.262	4.262	0	627999	15	>100:1			1001.00	956.04	105.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.272		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.262	4.272	0	604272	15	>100:1			5005.00	5257.73	95.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.272		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.312	4.312	0	101460	15	>100:1			1001.00	1350.68	113.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.322		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.332	4.333	0	50781	14	>100:1			1001.00	1032.18	109.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.333		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.477	4.477	0	103177	20	>100:1			1001.00	1318.07	97.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.486		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.495	4.495	0	46456	14	>100:1			1001.00	1118.18	88.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.504		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.540	4.540	0	592300	17	>100:1			1001.00	797.79	90	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.540		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.785		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.002	5.002	0	765229	19	>100:1			1001.00	874.52	93.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		5.008		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.394	5.402	0	942529	17	>100:1			1001.00	1125.97	101.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.394	5.402	0/0	5744	15	31:1	Target = 10.45		10.209	10.209		
813 > 269	40	5.394	5.402		738	26	26:1	7.78 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.786		ND								
*** 37 13C2_PFDA**													
515 > 470		3.951	3.951	0	665970	16	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.468	2.459	1	589466	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.218	3.225	0	508628	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.717	1.717	0	475540	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.598	3.598	0	137591	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\073121-DOD.b\073121007.d		
Injection Date:	31-Jul-2021 13:04:55	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.699	1	609606	21	>100:1			1001.00	1105.57	96.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.705		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.067	1	568132	16	>100:1			1001.00	1100.31	97.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.067		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	1	171331	15	>100:1			1001.00	987.12	94.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.120		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.451		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.389	2.380	1	107904	18	>100:1			5005.00	5412.56	98.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.380		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.425	2.425	1	627508	17	>100:1			1001.00	1040.53	93.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.425		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.541	2.541	1	1220739	17	>100:1			5005.00	5731.95	96.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.541		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.791	2.791	1	535330	18	>100:1			1001.00	1103.81	98.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.800		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.809	2.809	1	152660	17	>100:1			1001.00	1099.21	103.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.800		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.827		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.174		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.140	3.148	0	96584	20	>100:1			5005.00	6158.61	103.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.141		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.167	3.168	0	527786	21	>100:1			1001.00	1066.75	103.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.168		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.545	0	139733	19	>100:1			1001.00	1003.29	94.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.545		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.754		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.880		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.197		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.357		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.701		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.544	3.553	0	649103	19	>100:1			1001.00	1065.51	102.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.553		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.836	3.839	0	284462	17	>100:1			1001.00	1065.48	99.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.839		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.893	3.888	1	111770	17				5005.00	6603.41	103	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.896		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.500		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.893	3.896	0	588720	17	>100:1			1001.00	998.07	95.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.896		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.050	4.054	0	679044	18	>100:1			5005.00	5087.06	106.3	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.063		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.213	4.217	0	614742	16	>100:1			1001.00	935.86	91.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.206		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.213	4.217	0	603087	16	>100:1			5005.00	5247.42	101.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.217		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.274	4.278	0	87606	16	>100:1			1001.00	1166.25	96.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.288		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.294	4.288	1	50301	11	>100:1			1001.00	1022.43	92.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.298		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.437	1	90927	15	>100:1			1001.00	1161.57	95.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.446		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.461	4.464	0	49036	16	>100:1			1001.00	1180.28	94.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.473		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.487	4.491	0	614476	15	>100:1			1001.00	827.66	94.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.482		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.728		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.949	4.951	0	914972	18	>100:1			1001.00	1045.65	96	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.951		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.335	5.339	0	933402	18	>100:1			1001.00	1115.07	103.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.343	5.339	1/1	5340	16	26:1	Target = 10.45		9.5839	9.5839		
813 > 269	40	5.343	5.339		633	17	29:1	8.43 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.712		ND								
*** 37 13C2_PFDA**													
515 > 470		3.893	3.896	0	618812	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.425	2.425	1	578002	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.167	3.168	0	519387	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.699	1.699	1	527602	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.544	3.545	0	135742	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\080321-DOD.b\080321007.d		
Injection Date:	03-Aug-2021 13:17:37	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.698	1	611743	21	>100:1			1001.00	1109.45	96.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.698		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.066	1	563144	15	>100:1			1001.00	1090.65	95.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.066		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.119	1	181147	15	>100:1			1001.00	1043.68	97.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.119		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.451		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.380	2.379	1	111520	17	>100:1			5005.00	5593.94	94.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.379		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.425	2.415	1	642249	17	>100:1			1001.00	1064.97	94.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.415		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.541	2.531	1	1241310	17	>100:1			5005.00	5828.54	97.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.531		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.791	2.781	1	512712	18	>100:1			1001.00	1057.17	93.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.790		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.809	2.799	1	147877	18	>100:1			1001.00	1064.77	94.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.799		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.827		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.172		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.147	3.139	1	92382	19	>100:1			5005.00	5890.67	94.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.139		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.167	3.165	1	506643	22	>100:1			1001.00	1024.01	99.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.165		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.535	1	144332	18	>100:1			1001.00	1036.31	100.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.535		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.745		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.885		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.183		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.353		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.698		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.536	3.543	0	655920	20	>100:1			1001.00	1076.71	96.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.543		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.828	3.828	1	308533	17	>100:1			1001.00	1155.64	104	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.836		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.885	3.885	1	95420	17				5005.00	5637.45	98.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.885		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.496		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.894	3.893	1	620723	18	>100:1			1001.00	1052.33	99.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.893		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.043	4.050	0	667092	17	>100:1			5005.00	4997.53	88	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.050		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.204	4.202	1	688211	16				1001.00	1047.70	97.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.213		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.204	4.202	1	680834	16	>100:1			5005.00	5923.89	98.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.213		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.265	4.264	1	88821	15	>100:1			1001.00	1182.42	95.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.274		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.286	4.284	1	52388	13	100:1			1001.00	1064.85	98.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.284		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.435	4.424	1	95752	14				1001.00	1223.21	93.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.442		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.453	4.451	1	46531	15	>100:1			1001.00	1119.98	93.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.460		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.480	4.478	1	624613	16				1001.00	841.31	89.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.478		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.725		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.950	4.949	1	974860	17	>100:1			1001.00	1114.09	99.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.949		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.338	5.335	1	938618	17	>100:1			1001.00	1121.30	98.6	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.343	1/0	5858	17	28:1	Target = 10.45		10.455	10.455		
813 > 269	40	5.338	5.343		466	21	29:1	12.57 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.717		ND								
*** 37 13C2_PFDA**													
515 > 470		3.894	3.893	1	645055	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.425	2.415	1	602307	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.167	3.165	1	523932	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.699	1.698	1	527530	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.536	3.535	1	138830	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\organics\LL\LCMSMS01.i\080321-DOD.b\080321012.d		
Injection Date:	03-Aug-2021 10:26:02	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.715	1	1250230	20	>100:1			1001.00	1431.85	105.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.715		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.079	2.079	1	1182791	16	>100:1			1001.00	1320.01	93.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.079		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.131	1	368874	16	>100:1			1001.00	1319.75	118.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.131		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.485		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.416	0	365522	18	>100:1			5005.00	9887.19	98.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.416		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.450	1	1130770	18	>100:1			1001.00	1424.15	105.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.459		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.572	2.572	1	815953	18	>100:1			5005.00	4532.80	116.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.579		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.830	2.838	0	1115735	18	>100:1			1001.00	1373.53	103.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.838		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.839	2.846	0	331537	19	>100:1			1001.00	1309.41	108	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.846		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.873		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.221		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.183	3.195	0	319876	22	>100:1			5005.00	9397.34	107.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.202		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.209	3.221	0	1129172	23	>100:1			1001.00	1401.34	110.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.214		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.579	3.584	0	262019	26	>100:1			1001.00	1229.85	101.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.593	3.584	1/1	1904	30	10:1	Target = 4.05	0.20	6.5752	6.5752		
499 > 99	54	3.601	3.584		494	30	4.5:1	3.85 (2.02-6.07)	2.24				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.788		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.914		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.213		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.379		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.717		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.586	3.591	0	1050156	20	>100:1			1001.00	1224.17	103.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.591		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.862	3.861	1	527624	19	>100:1			1001.00	1226.02	107.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.869		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.931	3.929	1	308593	17	>100:1			5005.00	10720	107.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.929		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.518		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.923	3.937	0	992080	19	>100:1			1001.00	1342.92	100.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.929		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.084	4.090	0	1329647	16	>100:1			5005.00	6858.84	101.9	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.090		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.233	4.241	0	1381455	16	>100:1			5005.00	7870.15	117.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.251		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.233	4.241	0	866289	17	>100:1			1001.00	1234.91	105.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.241		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.280	4.279	1	157567	15	>100:1			1001.00	838.87	106.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.288		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.299	4.297	1	71126	14	>100:1			1001.00	1120.68	83.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.297		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.441	4.439	1	162265	18	>100:1			1001.00	921.52	108.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.453		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.463	4.453	1	64113	16	>100:1			1001.00	1060.99	104.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.469		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.504	4.510	0	845404	17	>100:1			1001.00	1134.58	94	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.510		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.748		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.960	4.968	0	1016639	16	>100:1			1001.00	1326.55	104	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.968		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.352	5.360	0	509407	17	>100:1			1001.00	1043.45	105.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.352	5.360	0/0	7760	14	20:1	Target = 12.85		10.477	10.477		
813 > 269	40	5.360	5.360		572	21	19:1	13.56 (6.42-19.29)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.740		ND								
*** 37 13C2_PFDA**													
515 > 470		3.923	3.929	0	876341	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.450	1	984526	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.215	3.214	1	1026437	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.715	1.715	1	1087225	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.579	3.584	0	245358	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Extract Dilution Preparations

537	**1X**	**5X**	**10X**	**20X**	**50X**	**100X**	**200X**	**500X**	**1000X**	**2000X**
EXTRACT (uL)	950	200	100	50	20	10	20	8	4	2
IS (uL)	50	40	45	47.5	49	49.5	199	199.6	199.8	199.9
96% MeOH (uL)	-	760	855	902.5	931	940.5	3781	3792.4	3796.2	3798.1
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/Vol	1/(Vol*0.2)	1/(Vol*0.1)	1/(Vol*0.05)	1/(Vol*0.02)	1/(Vol*0.01)	1/(Vol*0.005)	1/(Vol*0.002)	1/(Vol*0.001)	1/(Vol*0.0005)
ID Aq	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	(1/0.91)* (FV/V_o)	5* (FV/V_o)	10* (FV/V_o)	20* (FV/V_o)	50* (FV/V_o)	100* (FV/V_o)	200* (FV/V_o)	500* (FV/V_o)	1000* (FV/V_o)	2000* (FV/V_o)
DAI	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
SAMPLE (uL)	700	140	70	35	14	7	14	5.6	2.8	1.4
SUR (uL)	25	25	25	25	25	25	100	100	100	100
MeOH (uL)	275	275	275	275	275	275	1100	1100	1100	1100
Water (uL)	0	560	630	665	686	693	2786	2794.4	2797.2	2798.6
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/.7	1/.14	1/.07	1/.035	1/.014	1/.007	4/.014	4/.0056	4/.0028	4/.0014
ID Solid	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	((V_E/(M*S))/ 0.91)/1000	((V_E/(M*S))/ 0.2)/1000	((V_E/(M*S))/ 0.1)/1000	((V_E/(M*S))/ 0.05)/1000	((V_E/(M*S))/ 0.02)/1000	((V_E/(M*S))/ 0.01)/1000	((V_E/(M*S))/ 0.005)/1000	((V_E/ (M*S))/ 0.002)/1000	((V_E/ (M*S))/ 0.001)/1000	((V_E/ (M*S))/ 0.0005)/1000

NOTE: Dilutions of 100x or below will be prepped in 1-mL FV; dilutions higher than 100x and will be prepped in 4-mL FV.

Analyst: ALM **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1746

Prep Batch: 10188

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/27/2021 1619
End Date: 07/27/2021 2229

Conc Analyst: ALM
Conc Start Date: 07/27/2021 0000
Conc End Date: 07/27/2021 0000

Surrogate: SVLC-1581
Surrogate Vol. (mL): 0.110

Ext Solvent: MEOH>96%/MEOH/4%/H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ10188-001	MB		1	PFAS by ID SOP QSMB-15	250		250		0.000	10.0	Init: 293.75g; Final: 33.28g
WQ10188-002	LCS		1	PFAS by ID SOP QSMB-15	250		250	SVLC-1575	0.200	10.0	Init: 290.76g; Final: 33.00g
WG27016-001	Sample	AFFF21-GAC-01-072621-00	1	PFAS by ID SOP QSMB-15	305.29	33.74	272		0.000	10.0	Sorbent dry start/end: 1st: 1805/1810,2nd: 2145/2150;Buf 584;Amm-MeOH-SV21-593(4mL);QC Water:21-1503;
WG20004-019	Sample	FB-07-071521	1	PFAS by ID SOP QSMB-15	285.31	31.92	253		0.000	10.0	Bottletop#329;Pipettes:20-2535,20-1288;QC Bottles: M-1-172-04BB;XL-AW.21-1522;Reservoirs:21-998;
WG20004-020	Sample	ACPC5-14D12A-071621	1	PFAS by ID SOP QSMB-15	303.33	32.23	271		0.000	10.0	Filter cartridges:21-1634;Elution tubes:21-1455;Falcon tubes:21-582;Centrifuge tubes:20-2814
WG20004-021	Sample	ACPC5-14D12A-071621-FD	1	PFAS by ID SOP QSMB-15	299.13	32.86	266		0.000	10.0	MeOH Ext:4mL,Filt:2mL;IS:SVLC-1576(0.010mL); ASV/Caps: 21-714/21-715;Storage bottles:20-2633/21-1346;
WG20004-022	Sample	ACPC3-WI9-2-071621	1	PFAS by ID SOP QSMB-15	327.41	31.92	295		0.000	10.0	
WG20004-023	Sample	ACPC3-WI7-10-071621	1	PFAS by ID SOP QSMB-15	324.81	32.46	292		0.000	10.0	
WG20004-024	Sample	ACPC24-171A-071621	1	PFAS by ID SOP QSMB-15	297.46	32.21	265		0.000	10.0	
WG20004-024MSMS			1	PFAS by ID SOP QSMB-15	297.12	31.9	265	SVLC-1575	0.200	10.0	
WG20004-025	Sample	FB-08-071621	1	PFAS by ID SOP QSMB-15	301.48	32.32	269		0.000	10.0	
WG20004-026	Sample	FB-07-071621	1	PFAS by ID SOP QSMB-15	291.93	32.42	260		0.000	10.0	
WG27017-001	Sample	AFFF21-FRB-01-072621-00	1	PFAS by ID SOP QSMB-15	298.32	33.59	265		0.000	10.0	
WG27017-002	Sample	AFFF21-ICE-01-072621-01	1	PFAS by ID SOP QSMB-15	215.23	33.15	182		0.000	10.0	NCM56610

Analyst: ALM **Level 2 Analyst:** NA

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1746

Prep Batch: 10188

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/27/2021 1619
End Date: 07/27/2021 2229

Conc Analyst: ALM
Conc Start Date: 07/27/2021 0000
Conc End Date: 07/27/2021 0000

Surrogate: SVLC-1581
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH-96%MECH/4%H2O

Reagents Vol. (mL): 10

Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WG22011-001	Sample	ACRC24-W89-1-071921	1	PFAS by ID SOP QSMB-15	306.62	32.64	274		0.000	10.0	
WG22011-002	Sample	ACRC3-W7-3-071921	1	PFAS by ID SOP QSMB-15	305.64	32.42	273		0.000	10.0	
WG22011-003	Sample	ACRC3-W7-3-071921-FD	1	PFAS by ID SOP QSMB-15	316.86	32.59	284		0.000	10.0	
WG22011-004	Sample	ACRC3-W7-11-071921	1	PFAS by ID SOP QSMB-15	285.55	31.86	254		0.000	10.0	NCM56611
WG22011-005	Sample	ACRC03-W7-13-071921	1	PFAS by ID SOP QSMB-15	317.07	32.2	285		0.000	10.0	
WG22011-006	Sample	ACRC03-UST-MW-02-071921	1	PFAS by ID SOP QSMB-15	292.64	32.47	260		0.000	10.0	
WG22011-007	Sample	ACRC21-W4-14-071921	1	PFAS by ID SOP QSMB-15	298.38	32.89	265		0.000	10.0	
WG22011-007DUP	Duplicate		1	PFAS by ID SOP QSMB-15	285.07	32.28	253		0.000	10.0	
WG22011-008	Sample	ACRC21-W6-6-071921	1	PFAS by ID SOP QSMB-15	291.72	32.55	259		0.000	10.0	
WG22011-009	Sample	FB-09-071921	1	PFAS by ID SOP QSMB-15	229.83	33.04	197		0.000	10.0	NCM56610

(end of report) **Total Samples: 20**

Analyst: ALM **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1754

Prep Batch: 10346

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/28/2021 1734
End Date: 07/28/2021 2141

Conc Analyst: ALM
Conc Start Date: 07/28/2021 0000
Conc End Date: 07/28/2021 0000

Surrogate: SVLC-1584
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH+96%MECH/4%H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ10346-001	MB		1	PFAS by ID SOP QSMB-15	250		250		0.000	10.0	Init: 287.15g; Final: 32.01g
WQ10346-002	LCS		1	PFAS by ID SOP QSMB-15	250		250	SVLC-1583	0.200	10.0	Init: 292.13g; Final: 32.41g
WG28013-005	Sample	AFFF21-FRB-01-0727-T4	1	PFAS by ID SOP QSMB-15	272.19	32.33	240		0.000	10.0	Sorbent dry start/end:2056/2101;Buffer:SV21-584;Amm-MeOH:SV21-585(4mL);QC Water:21-1503;
WG27059-001	Sample	Shaw-source-007	1	PFAS by ID SOP QSMB-15	313.9	32.69	281		0.000	10.0	Bottletop#329;Pipettes:20-2535,20-1288;QC Bottles: M-1-172-04BB;XL-AW:21-1522;Reservoirs:21-998;
WG27059-002	Sample	Shaw-source-007-FRB	1	PFAS by ID SOP QSMB-15	281.17	32.28	249		0.000	10.0	Filter cartridges:21-1634;Elution tubes:21-1455;Storage bottles:21-2633;
WG27059-003	Sample	Shaw-source-001	1	PFAS by ID SOP QSMB-15	289.18	32.01	257		0.000	10.0	MeOH Ext:4mL,Filt:2mL;IS:SVLC-1576(0.010mL); ASV/Caps: 21-714/21-715;
WG22011-010	Sample	ACPC9-W2-13-072021	1	PFAS by ID SOP QSMB-15	303.5	32.77	271		0.000	10.0	
WG22011-011	Sample	ACPC21-W6-5-072021	1	PFAS by ID SOP QSMB-15	291.28	32.84	258		0.000	10.0	
WG22011-012	Sample	ACPC17,21-WU5-12-072021	1	PFAS by ID SOP QSMB-15	301.2	32.39	269		0.000	10.0	
WG22011-012MS	MS		1	PFAS by ID SOP QSMB-15	294.99	32.35	263	SVLC-1583	0.200	10.0	
WG22011-012MD	MSD		1	PFAS by ID SOP QSMB-15	302.76	32.57	270	SVLC-1583	0.200	10.0	
WG22011-013	Sample	SWB-01-072021	1	PFAS by ID SOP QSMB-15	326.74	32.58	294		0.000	10.0	

(end of report) **Total Samples: 8**

Analyst: MBR **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1754

Prep Batch: 10452

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/29/2021 1100
End Date: 07/29/2021 1540

Conc Analyst: MBR
Conc Start Date: 07/29/2021 1540
Conc End Date: 07/29/2021 1540

Surrogate: SVLC-1584B
Surrogate Vol. (mL): 0.110

Ext Solvent: MEOH-96%/MEOH/4%H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ10452-001	MB		1	PFAS by ID SOP QSMB-15	280	30	250		0.000	10.0	MB init:277.98g,fin:31.31g;LCS init:294.54g,fin:32.14g
WQ10452-002	LCS		1	PFAS by ID SOP QSMB-15	280	30	250	SVLC-1583	0.200	10.0	Sorbent dry start/end:1st:1202/1207,2nd:1446/1451;Buf 584;Amm-MeOH:SV21-593(4mL);QC Water:21-1503
WG22011-014	Sample	ACRC21-WU5-10-072021	1	PFAS by ID SOP QSMB-15	282.49	31.71	251		0.000	10.0	Bottletop#329;Pipettes:20-2535,383;QC Bottles: M-1-172-04BB;XL-AW:21-1522;Reservoirs:21-998;
WG22011-015	Sample	ACRC21-WI4-6-072021	1	PFAS by ID SOP QSMB-15	303.22	48.95	254		0.000	10.0	NCM#56734
WG22011-016	Sample	FB-10-072021	1	PFAS by ID SOP QSMB-15	310.31	32.52	278		0.000	10.0	Filter cartridges:21-1634;Elution tubes:21-1455;Falcon tubes:21-582;Centrifuge tubes:20-2814;Storage bottles:21-1346;
WG22011-017	Sample	ACRC10-WGC2-13-072121	1	PFAS by ID SOP QSMB-15	304.23	32.17	272		0.000	10.0	MeOH Ext:4mL,Filt:2mL;IS:SVLC-1576(0.010mL); ASV/Caps: 21-714/21-715
WG22011-018	Sample	ACRC10-WGC2-8-072121	1	PFAS by ID SOP QSMB-15	323.38	31.87	292		0.000	10.0	
WG22011-019	Sample	ACRC10-WGC2-10-072121	1	PFAS by ID SOP QSMB-15	307.44	50.31	257		0.000	10.0	
WG22011-020	Sample	ACRC10-WGC2-1-072121	1	PFAS by ID SOP QSMB-15	286.09	32.34	254		0.000	10.0	NCM#56733
WG22011-021	Sample	FB-11-072121	1	PFAS by ID SOP QSMB-15	290.47	32.72	258		0.000	10.0	
WG22019-004	Sample	RRAD-FFTA-EB-SE-1-072021	1	PFAS by ID SOP QSMB-15	330.23	31.55	299		0.000	10.0	
WG22019-008	Sample	RRAD-FFTA-EB-S0-1-072021	1	PFAS by ID SOP QSMB-15	305.71	31.65	274		0.000	10.0	
WG22019-009	Sample	RRAD-FFTA-SB-1-072021	1	PFAS by ID SOP QSMB-15	308.12	32.07	276		0.000	10.0	

Analyst: MBR **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1754

Prep Batch: 10452

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/29/2021 1100
End Date: 07/29/2021 1540

Conc Analyst: MBR
Conc Start Date: 07/29/2021 1540
Conc End Date: 07/29/2021 1540

Surrogate: SVLC-1584B
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH-96%MECH/4%H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WG22019-010	Sample	RRAD-FFTA-FB-1-072021	1	PFAS by ID SOP QSMB-15	313.62	31.54	282		0.000	10.0	
WG22067-001	Sample	DPG-IDW-AQ-2-072021	1	PFAS by ID SOP QSMB-15	325.49	33.5	292		0.000	10.0	NCM#56735
WG22086-001	Sample	DPG-EB-07-072021	1	PFAS by ID SOP QSMB-15	332.72	33.52	299		0.000	10.0	
WG22086-002	Sample	DPG-EB-08-072021	1	PFAS by ID SOP QSMB-15	331.72	32.62	299		0.000	10.0	
WG22086-003	Sample	DPG-EB-09-072021	1	PFAS by ID SOP QSMB-15	332.88	33.5	299		0.000	10.0	
WG22086-004	Sample	DPG-EB-10-072021	1	PFAS by ID SOP QSMB-15	318.56	32.67	286		0.000	10.0	
WG22086-011	Sample	DPG-WW06-072021	1	PFAS by ID SOP QSMB-15	322.38	33.04	289		0.000	10.0	
WG22086-011MS	MS		1	PFAS by ID SOP QSMB-15	322.31	33.39	289	SVLC-1583	0.200	10.0	
WG22086-011MD	MSD		1	PFAS by ID SOP QSMB-15	316.32	33.47	283	SVLC-1583	0.200	10.0	
WG22086-012	Sample	DPG-FB-06-072021	1	PFAS by ID SOP QSMB-15	328.15	32.81	295		0.000	10.0	
WG22086-013	Sample	DPG-FD-04-GW-072021	1	PFAS by ID SOP QSMB-15	318.59	32.76	286		0.000	10.0	

(end of report) **Total Samples: 20**

Analyst: ALM **Level 2 Analyst:** NA

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1747

Prep Batch: 10648

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/30/2021 1838
End Date: 07/30/2021 2316

Conc Analyst: ALM
Conc Start Date: 07/30/2021 0000
Conc End Date: 07/30/2021 0000

Surrogate: SVLC-1584
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH-96%MECH/4%H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ10648-001	MB		1	PFAS by ID SOP QSMB-15	250		250		0.000	10.0	Init: 287.76g; Final: 32.79g; NOM:56830, 56831
WQ10648-002	LCS		1	PFAS by ID SOP QSMB-15	250		250	SVLC-1583	0.200	10.0	Init: 287.32g; Final: 33.34g
WG30006-008	Sample	AFFF21-GW03-23-072921-00-T4	1	PFAS by ID SOP QSMB-15	276.86	32.78	244		0.000	10.0	Sorbent dry start/end:2159/2204;Buffer:SV21-584;Amm-MeOH:SV21-593(4mL);QC Water:21-1503;
WG30006-009	Sample	AFFF21-GW03-15-072921-00-T4	1	PFAS by ID SOP QSMB-15	294.95	33.48	261		0.000	10.0	Bottletop#329;Pipettes:20-2535,393,21-1600;QC Bottles: M-1-172-04BB;XL-AW.21-1522;Reservoirs:21-998;
WG29009-001	Sample	AFFF01-SW01-072821-00-T2	1	PFAS by ID SOP QSMB-15	321.54	45.49	276		0.000	10.0	Filter cartridges:21-1519;Falcon tubes:21-582;Centrifuge tubes:20-2814;Storage bottles:20-2633;
WG29009-001MS	MS		1	PFAS by ID SOP QSMB-15	314.47	45.88	269	SVLC-1583	0.200	10.0	MeOH Ext:4mL,Filt:2mL;IS:SVLC-1576(0.010mL); ASV/Caps: 21-714/21-715;
WG29009-001MD	MSD		1	PFAS by ID SOP QSMB-15	308.54	45.71	263	SVLC-1583	0.200	10.0	
WG29009-009	Sample	AFFF01-RB-072821-01-T1	1	PFAS by ID SOP QSMB-15	270.43	32.03	238		0.000	10.0	
WG20004-020	Sample	ACFC5-14D12A-071621	2	PFAS by ID SOP QSMB-15	319.07	32.59	286		0.000	10.0	
WG20004-021	Sample	ACFC5-14D12A-071621-FD	2	PFAS by ID SOP QSMB-15	315.43	32.96	282		0.000	10.0	
WG22011-001	Sample	ACFC24-W89-1-071921	2	PFAS by ID SOP QSMB-15	294.56	32.35	262		0.000	10.0	
WG22011-002	Sample	ACFC3-W7-3-071921	2	PFAS by ID SOP QSMB-15	315.62	32.26	283		0.000	10.0	

(end of report) **Total Samples: 8**

Analyst: ARC2 **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1753

Prep Batch: 10675

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/31/2021 1209
End Date: 07/31/2021 1523

Conc Analyst: ARC2
Conc Start Date: 07/31/2021 1523
Conc End Date: 07/31/2021 1523

Surrogate: SVLC-1584
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH-96%/MECH/4%/H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ10675-001	MB		1	PFAS by ID SOP QSMB-15	280	30	250		0.000	10.0	MB init:278.99g,fin:32.29g;LCS init:268.46g,fin:32.27g;
WQ10675-002	LCS		1	PFAS by ID SOP QSMB-15	280	30	250	SVLC-1583	0.200	10.0	Sorbent dry start/end:1347/1352;Buffer:SV21-597;Amm-MeOH:SV21-593(4mL);QC Water:21-1503;
WG22011-003	Sample	ACRC3-W7-3-071921-FD	2	PFAS by ID SOP QSMB-15	309.04	32.4	277		0.000	10.0	Bottletop#329;Pipettes:20-2534,20-1600;QC Bottles: M-1-172-04BB;XL-AW:21-1522;Reservoirs:21-687;
WG22011-004	Sample	ACRC3-W7-11-071921	2	PFAS by ID SOP QSMB-15	295.52	31.85	264		0.000	10.0	Filter cartridges:21-1636;Elution tubes:21-1455;Falcon tubes:21-582;Centrifuge tubes:20-2814;Storage bottles:21-1346;
WG22011-005	Sample	ACRC03-W7-13-071921	2	PFAS by ID SOP QSMB-15	303.48	31.93	272		0.000	10.0	MeOH Ext:4mL,Filt:2mL;IS:SVLC-1576(0.010mL); ASV/Caps: 21-714/21-715;
WG22011-006	Sample	ACRC03-UST-MW-02-071921	2	PFAS by ID SOP QSMB-15	290.65	33.54	257		0.000	10.0	NCM#56837
WG22011-008	Sample	ACRC21-W6-6-071921	2	PFAS by ID SOP QSMB-15	302.03	31.92	270		0.000	10.0	
WG30020-001	Sample	AFFF01-FRB-01-072921-T2	1	PFAS by ID SOP QSMB-15	261.52	32.5	229		0.000	10.0	
WG28008-004	Sample	ASTC-VAP-13GW(22-25)-(072721)	1	PFAS by ID SOP QSMB-15	319.02	33.34	286		0.000	10.0	
WG28008-004DU	Duplicate		1	PFAS by ID SOP QSMB-15	317.87	32.11	286		0.000	10.0	
WG28008-005	Sample	ASTC-VAP-13GW(32-35)-(072721)	1	PFAS by ID SOP QSMB-15	318.11	32.66	285		0.000	10.0	
WG28008-005MS	MS		1	PFAS by ID SOP QSMB-15	315.78	32.53	283	SVLC-1583	0.200	10.0	

Analyst: ARC2 **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 08/10/21 1753

Prep Batch: 10675

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 07/31/2021 1209
End Date: 07/31/2021 1523

Conc Analyst: ARC2
Conc Start Date: 07/31/2021 1523
Conc End Date: 07/31/2021 1523

Surrogate: SVLC-1584
Surrogate Vol. (mL): 0.110

Ext Solvent: MECH>96%/MECH/4%/H2O
Reagents Vol. (mL): 10
Chem ID: 21-946>21-946/21-1503

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments

(end of report) **Total Samples: 8**

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **D. WILSON** **DATE:** **SEPTEMBER 11, 2021**

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

SUBJECT: **ORGANIC DATA VALIDATION – POLYFLUOROALKYL SUBSTANCES (PFAS)**
NASA-AMES
SAMPLE DELIVERY GROUP (SDG) WG24008

SAMPLES: 6/Aqueous

AOPC13-SW01-EF-072221	AOPC13-SW01-EF-072221-FD
AOPC13-SW01-IN-072221	AOPC15-SW01-EF-072321
AOPC15-SW01-IN-072321	AOPC20-SW01-EF-072221

Overview

The sample set for NASA-Ames, SDG WG24008, consisted of six (6) aqueous samples. All samples were analyzed for polyfluoroalkyl substances (PFAS). One (1) field duplicate pair, AOPC13-SW01-EF-072221 / AOPC13-SW01-EF-072221-FD, was associated with this SDG.

The samples were collected by Tetra Tech, Inc. on July 22 and 23, 2021 and analyzed by Pace Analytical Services. All analyses were conducted in accordance with Department of Defense ((DOD)/Department of Energy (DOE) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3, PFAS using LC/MS/MS Appendix B Table B-15 (2019). The data contained in this SDG was validated via EPA Stage 4 with regard to the following parameters:

*	• Data completeness
*	• Hold times/Sample Preservation
*	• Mass Calibration
*	• LC/MS/MS System Tuning and Performance
*	• Mass Spectral Acquisition Rate
*	• Instrument Sensitivity Check
*	• Ion Transition Check
*	• Ion Ratios
	• Initial/Continuing Calibrations
*	• Laboratory Instrument / Preparation Blank Results
*	• Extraction Internal Standard Recoveries
*	• Laboratory Control Sample Results
	• Matrix Spike / Matrix Spike Duplicate Results
*	• Field Duplicate Precision
*	• Compound Identification
*	• Compound Quantitation
*	• Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, and documentation supporting these findings is presented in Appendix C.

PFAS

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

The continuing calibration verification on 08/04/2021 at 18:19 had a percent recovery for 6:2 FTS above the 130% quality control limit Samples AOPC13-SW01-EF-072221, AOPC13-SW01-EF-072221-FD andAOPC15-SW01-EF-07232 . Nondetected results were qualified as estimated, (UJ).

Additional Comments

Non-detected results were reported to the limit of detection (LOD).

Instances of manual integrations were present in this data package. All manual integrations were documented by the laboratory and are noted in the raw data of the original data package.

Sample AOPC13-SW01-IN-072221 was analyzed at a 50X dilution.

The matrix spike duplicate percent recoveries for perfluorohexanesulfonic acid (PFHxS) and perfluorooctanesulfonic acid (PFOS) were above the quality control limits for sample AOPC15-SW01-EF-072321. The matrix spike / matrix spike duplicate relative percent difference for 6:2 fluorotelomer sulfonate (6:2FTS) was outside the quality control limit. No validation actions were required as the affected sample results were nondetected.

Executive Summary

Laboratory Performance Issues: 6:2 FTS was above the CCV criteria affecting three samples.

Other Factors Affecting Data Quality: Detected results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled “Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis be QSM Table B15” (May 1, 2020). The text of this report has been formulated to address only those areas affecting data quality.

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

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

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

Data Qualifier Definitions

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

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

Appendix A

Qualified Analytical Results

Qualifier Codes:

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

PROJ_NO: 09033A	NSAMPLE	AOPC13-SW01-EF-072221			AOPC13-SW01-EF-072221-FD			AOPC13-SW01-IN-072221			AOPC15-SW01-EF-072321		
SDG: WG24008	LAB_ID	WG24008-003			WG24008-004			WG24008-002			WG24008-005		
FRACTION: PFAS	SAMP_DATE	7/22/2021			7/22/2021			7/22/2021			7/23/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF				AOPC13-SW01-EF-072221								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.6	U		3.8	U		200	U		4	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.6	U		3.8	U		200	U		4	U	
4:2 FLUOROTELOMER SULFONATE		3.6	U		3.8	U		200	U		4	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		3.6	UJ	C	3.8	UJ	C	4300			4	UJ	C
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.6	U		3.8	U		200	U		4	U	
9CL-PF3ONS		3.6	U		3.8	U		200	U		4	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.6	U		3.8	U		200	U		4	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.6	U		3.8	U		200	U		4	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.6	U		3.8	U		200	U		4	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.8	U		0.97	J	P	330			2	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		1.8	U		1.9	U		310			2	U	
PERFLUOROBUTANOIC ACID (PFBA)		1.8	U		1.9	U		260			3.9	J	P
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U		1.9	U		100	U		2	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U		1.9	U		100	U		2	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U		1.9	U		100	U		2	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.8	U		1.9	U		180	J	P	2	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		1.8	U		1.9	U		160	J	P	2	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		1.8	U		1.9	U		2600			2	U	
PERFLUOROHEXANOIC ACID (PFHXA)		1.8	U		1.9	U		1600			2	U	
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U		1.9	U		100	U		2	U	
PERFLUORONONANOIC ACID (PFNA)		1.8	U		1.9	U		100	U		2	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.8	U		1.9	U		100	U		2	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2.5	J	P	4.1			6800			2	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		1.8	U		1.9	U		330			2	U	

PROJ_NO: 09033A	NSAMPLE	AOPC15-SW01-IN-072321			AOPC20-SW01-EF-072221		
SDG: WG24008	LAB_ID	WG24008-006			WG24008-001		
FRACTION: PFAS	SAMP_DATE	7/23/2021			7/22/2021		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.7	U		3.5	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.7	U		3.5	U	
4:2 FLUOROTELOMER SULFONATE		3.7	U		3.5	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		6.9	J	P	5.3	J	P
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		2	J	P	3.5	U	
9CL-PF3ONS		3.7	U		3.5	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.7	U		3.5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.7	U		3.5	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.7	U		3.5	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		17			36		
PERFLUOROBUTANESULFONIC ACID (PFBS)		12			60		
PERFLUOROBUTANOIC ACID (PFBA)		9.7			25		
PERFLUORODECANESULFONIC ACID (PFDS)		1.9	U		1.8	U	
PERFLUORODECANOIC ACID (PFDA)		1.9	U		1.8	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.9	U		1.8	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.4	J	P	12		
PERFLUOROHEPTANOIC ACID (PFHPA)		6.4			11		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		48			230		
PERFLUOROHEXANOIC ACID (PFHXA)		20			58		
PERFLUORONONANESULFONIC ACID (PFNS)		1.9	U		1.8	U	
PERFLUORONONANOIC ACID (PFNA)		1.9	U		1.8	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.9	U		1.8	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		47			210		
PERFLUOROPENTANESULFONIC ACID (PFPES)		8.3			50		

PROJ_NO: 09033A	NSAMPLE	AOPC13-SW01-EF-072221			AOPC13-SW01-EF-072221-FD			AOPC13-SW01-IN-072221			AOPC15-SW01-EF-072321		
SDG: WG24008	LAB_ID	WG24008-003			WG24008-004			WG24008-002			WG24008-005		
FRACTION: PFAS	SAMP_DATE	7/22/2021			7/22/2021			7/22/2021			7/23/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF				AOPC13-SW01-EF-072221								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.8	U		1.9	U		620			2	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U		1.9	U		100	U		2	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U		1.9	U		100	U		2	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U		1.9	U		100	U		2	U	

PROJ_NO: 09033A	NSAMPLE	AOPC15-SW01-IN-072321			AOPC20-SW01-EF-072221		
SDG: WG24008	LAB_ID	WG24008-006			WG24008-001		
FRACTION: PFAS	SAMP_DATE	7/23/2021			7/22/2021		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		19			23		
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.9	U		1.8	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.9	U		1.8	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.9	U		1.8	U	

Appendix B

Results as Reported by the Laboratory

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-001
Description: AOPC20-SW01-EF-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 0940
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1643	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/05/2021 1905	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.3	J	7.0	3.5	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	60		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	12		3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	50		3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	230		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	25		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	11		3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	58		3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	36		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	23		3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	210		3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		94	50-150		102	50-150
13C2_6:2FTS		100	50-150		111	50-150
13C2_8:2FTS		78	50-150		94	50-150
13C2_PFDoA		73	50-150		94	50-150
13C2_PFTeDA		72	50-150		86	50-150
13C3_PFBS		75	50-150		88	50-150
13C3_PFHxS		78	50-150		89	50-150
13C3-HFPO-DA		91	50-150		102	50-150
13C4_PFBA		78	50-150		90	50-150
13C4_PFHpA		79	50-150		95	50-150
13C5_PFHxA		78	50-150		98	50-150
13C5_PFPeA		82	50-150		101	50-150
13C6_PFDA		79	50-150		92	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-001
Description: AOPC20-SW01-EF-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 0940
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		81	50-150		89	50-150
13C8_PFOA		85	50-150		102	50-150
13C8_PFOS		79	50-150		97	50-150
13C8_PFOSA		81	50-150		104	50-150
13C9_PFNA		77	50-150		93	50-150
d5-EtFOSAA		85	50-150		99	50-150
d3-MeFOSAA		80	50-150		103	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-002
Description: AOPC13-SW01-IN-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1010
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	50	08/04/2021 1954	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	50	08/05/2021 2030	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	200	U	400	200	100	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	200	U	400	200	100	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	200	U	400	200	100	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4300		400	200	100	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	200	U	400	200	100	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	200	U	400	200	100	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	200	U	400	200	100	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	200	U	400	200	100	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	200	U	400	200	100	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	310		200	100	50	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	180	J	200	100	50	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	330		200	100	50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2600		200	100	50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	260		200	100	50	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	160	J	200	100	50	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1600		200	100	50	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	330		200	100	50	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	620		200	100	50	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	100	U	200	100	50	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	6800		200	100	50	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		110	50-150		113	50-150
13C2_6:2FTS		105	50-150		113	50-150
13C2_8:2FTS		102	50-150		126	50-150
13C2_PFDoA		99	50-150		122	50-150
13C2_PFTeDA		104	50-150		119	50-150
13C3_PFBS		97	50-150		108	50-150
13C3_PFHxS		99	50-150		114	50-150
13C3-HFPO-DA		110	50-150		122	50-150
13C4_PFBA		104	50-150		116	50-150
13C4_PFHpA		102	50-150		120	50-150
13C5_PFHxA		102	50-150		116	50-150
13C5_PFPeA		101	50-150		119	50-150
13C6_PFDA		99	50-150		123	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-002
Description: AOPC13-SW01-IN-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1010
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		107	50-150		121	50-150
13C8_PFOA		106	50-150		113	50-150
13C8_PFOS		106	50-150		116	50-150
13C8_PFOSA		109	50-150		127	50-150
13C9_PFNA		107	50-150		113	50-150
d5-EtFOSAA		112	50-150		125	50-150
d3-MeFOSAA		104	50-150		139	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-003
Description: AOPC13-SW01-EF-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1015
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1654	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.5	J	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		85	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		77	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		77	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		79	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-003
Description: AOPC13-SW01-EF-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1015
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		74	50-150
13C8_PFOSA		80	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-004
Description: AOPC13-SW01-EF-072221-FD
Matrix: Aqueous
Date Sampled: 07/22/2021 1015
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1704	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.97	J	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.1		3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		90	50-150
13C2_6:2FTS		114	50-150
13C2_8:2FTS		84	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		77	50-150
13C7_PFUdA		86	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-004
Description: AOPC13-SW01-EF-072221-FD
Matrix: Aqueous
Date Sampled: 07/22/2021 1015
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-005
Description: AOPC15-SW01-EF-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 0920
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1715	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	US	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.9	J	4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	US	4.0	2.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		109	50-150
13C2_8:2FTS		78	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		71	50-150
13C3-HFPO-DA		89	50-150
13C4_PFBA		81	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		85	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-005
Description: AOPC15-SW01-EF-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 0920
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-006
Description: AOPC15-SW01-IN-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 0925
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1840	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/05/2021 1915	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	2.0	J	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.9	J	7.4	3.7	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	12		3.7	1.9	0.93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.4	J	3.7	1.9	0.93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	8.3		3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	48		3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.7		3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	6.4		3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	20		3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	17		3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	19		3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	47		3.7	1.9	0.93	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		93	50-150		102	50-150
13C2_6:2FTS		86	50-150		95	50-150
13C2_8:2FTS		81	50-150		91	50-150
13C2_PFDoA		74	50-150		87	50-150
13C2_PFTeDA		74	50-150		83	50-150
13C3_PFBS		78	50-150		78	50-150
13C3_PFHxS		74	50-150		83	50-150
13C3-HFPO-DA		84	50-150		96	50-150
13C4_PFBA		84	50-150		91	50-150
13C4_PFHpA		83	50-150		94	50-150
13C5_PFHxA		76	50-150		92	50-150
13C5_PFPeA		82	50-150		88	50-150
13C6_PFDA		82	50-150		89	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24008-006
Description: AOPC15-SW01-IN-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 0925
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C7_PFUdA		80	50-150		82	50-150
13C8_PFOA		86	50-150		90	50-150
13C8_PFOS		75	50-150		88	50-150
13C8_PFOSA		79	50-150		95	50-150
13C9_PFNA		77	50-150		90	50-150
d5-EtFOSAA		78	50-150		94	50-150
d3-MeFOSAA		80	50-150		100	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Appendix C

Support Documentation

ANALYTE	ORIGINAL AOPC13-SW01-EF-072221	DUPLICATE AOPC13-SW01-EF-072221-FD	RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
PERFLUOROOCTANESULFONIC ACID (PFOS)	2.5	4.1	3.5	48.48	TRUE	FALSE	FALSE	FALSE
PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.8	0.97	3.5	59.93	TRUE	FALSE	FALSE	FALSE

Pace Analytical

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122964

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x Cam Mann	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Oakland State: CA Zip Code: 94612	Printed Name: Calite Neaves		WG24008
Project Name: NASA ARC PFAS			KE#2
Project No.: 103T6667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Aqueous	Solid	Air/Gases	Unpres.	HCl 01	HNO3	H2SO4	NaOH	Na2S2O3	Field Filtered	PFAS-24+1	Remarks / Cooler I.D.
AOPC20-SW01-EF-072221	7/22/21	0940	G	x			2							x	
AOPC13-SW01-IN-072221	7/22/21	1010	G	x			2							x	
AOPC13-SW01-EF-072221	7/22/21	1015	G	x			2							x	
AOPC13-SW01-EF-072221-FD	7/22/21	1015	G	x			2							x	Field duplicate MS/MSD
AOPC15-SW01-EF-072321	7/23/21	0920	G	x			6							x	
AOPC15-SW01-IN-072321	7/23/21	0925	G	x			2							x	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time
1. Relinquished by: Calite Neaves To Cam Mann	7/23/21	1500
2. Relinquished by:		
3. Relinquished by:		
4. Relinquished by: FED EX	7/24/21	940

	Date	Time
1. Received by:		
2. Received by:		
3. Received by:		
4. Laboratory received by: Jacqui Sabo	7/24/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on ice (Circle) (Yes) No Ice Pack Receipt Temp 4.8 °C Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME009N2-01

Sample Summary
Tetra Tech
Lot Number: WG24008
Project Name: NASA ARC PFAS
Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC20-SW01-EF-072221	Aqueous	07/22/2021 0940	07/24/2021
002	AOPC13-SW01-IN-072221	Aqueous	07/22/2021 1010	07/24/2021
003	AOPC13-SW01-EF-072221	Aqueous	07/22/2021 1015	07/24/2021
004	AOPC13-SW01-EF-072221-FD	Aqueous	07/22/2021 1015	07/24/2021
005	AOPC15-SW01-EF-072321	Aqueous	07/23/2021 0920	07/24/2021
006	AOPC15-SW01-IN-072321	Aqueous	07/23/2021 0925	07/24/2021

(6 samples)

Case Narrative
Tetra Tech
Lot Number: WG24008

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

The continuing calibration verification (CCV) associated with samples WG24008-003, WG24008-004, WG24008-005 for analytes: 6:2-FTS recovered above the upper control limit. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

The MS/MSD associated with sample WG24008-005 had multiple analytes recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

PFAS by LC/MS/MS - MB

Sample ID: WQ10417-001
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	50-150
13C2_6:2FTS		87	50-150
13C2_8:2FTS		75	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10417-001
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		73	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		80	50-150
13C8_PFOS		74	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10417-002
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	99	70-150	07/31/2021 1906
11Cl-PF3OUdS	15	14		1	94	70-150	07/31/2021 1906
8:2 FTS	15	12		1	78	67-138	07/31/2021 1906
6:2 FTS	15	13		1	88	64-140	07/31/2021 1906
4:2 FTS	15	14		1	92	63-143	07/31/2021 1906
GenX	32	33		1	102	70-150	07/31/2021 1906
ADONA	15	16		1	107	70-150	07/31/2021 1906
EtFOSAA	16	17		1	104	61-135	07/31/2021 1906
MeFOSAA	16	16		1	102	65-136	07/31/2021 1906
PFBS	14	16		1	113	72-130	07/31/2021 1906
PFDS	15	14		1	92	53-142	07/31/2021 1906
PFHpS	15	16		1	102	69-134	07/31/2021 1906
PFNS	15	15		1	99	69-127	07/31/2021 1906
PFOSA	16	15		1	96	67-137	07/31/2021 1906
PFPeS	15	15		1	103	71-127	07/31/2021 1906
PFHxS	15	15		1	104	68-131	07/31/2021 1906
PFBA	16	17		1	107	73-129	07/31/2021 1906
PFDA	16	17		1	103	71-129	07/31/2021 1906
PFDoA	16	18		1	115	72-134	07/31/2021 1906
PFHpA	16	17		1	107	72-130	07/31/2021 1906
PFHxA	16	17		1	108	72-129	07/31/2021 1906
PFNA	16	18		1	111	69-130	07/31/2021 1906
PFOA	16	18		1	113	71-133	07/31/2021 1906
PFPeA	16	18		1	114	72-129	07/31/2021 1906
PFTeDA	16	17		1	105	71-132	07/31/2021 1906
PFTrDA	16	19		1	120	65-144	07/31/2021 1906
PFUdA	16	18		1	113	69-133	07/31/2021 1906
PFOS	15	14		1	96	65-140	07/31/2021 1906

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	50-150
13C2_6:2FTS		85	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		76	50-150
13C5_PFPeA		77	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10417-002
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	50-150
13C7_PFUdA		74	50-150
13C8_PFOA		84	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG24008-005MS
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	15	16		1	111	70-150	08/04/2021 1725
11Cl-PF3OUdS	ND	15	16		1	108	70-150	08/04/2021 1725
8:2 FTS	ND	15	16		1	104	67-138	08/04/2021 1725
6:2 FTS	ND	15	9.9		1	66	64-140	08/04/2021 1725
4:2 FTS	ND	15	13		1	90	63-143	08/04/2021 1725
GenX	ND	31	30		1	95	70-150	08/04/2021 1725
ADONA	ND	15	17		1	112	70-150	08/04/2021 1725
EtFOSAA	ND	16	15		1	94	61-135	08/04/2021 1725
MeFOSAA	ND	16	17		1	109	65-136	08/04/2021 1725
PFBS	ND	14	15		1	105	72-130	08/04/2021 1725
PFDS	ND	15	15		1	100	53-142	08/04/2021 1725
PFHpS	ND	15	17		1	113	69-134	08/04/2021 1725
PFNS	ND	15	14		1	95	69-127	08/04/2021 1725
PFOSA	ND	16	15		1	92	67-137	08/04/2021 1725
PFPeS	ND	15	16		1	107	71-127	08/04/2021 1725
PFHxS	ND	14	16		1	110	68-131	08/04/2021 1725
PFBA	3.9	16	21		1	107	73-129	08/04/2021 1725
PFDA	ND	16	16		1	104	71-129	08/04/2021 1725
PFDoA	ND	16	17		1	110	72-134	08/04/2021 1725
PFHpA	ND	16	15		1	98	72-130	08/04/2021 1725
PFHxA	ND	16	16		1	99	72-129	08/04/2021 1725
PFNA	ND	16	17		1	107	69-130	08/04/2021 1725
PFOA	ND	16	18		1	112	71-133	08/04/2021 1725
PFPeA	ND	16	16		1	102	72-129	08/04/2021 1725
PFTeDA	ND	16	16		1	104	71-132	08/04/2021 1725
PFTrDA	ND	16	19		1	119	65-144	08/04/2021 1725
PFUdA	ND	16	17		1	110	69-133	08/04/2021 1725
PFOS	ND	15	17		1	117	65-140	08/04/2021 1725

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		110	50-150
13C2_8:2FTS		77	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		76	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG24008-005MS
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	50-150
13C7_PFUdA		83	50-150
13C8_PFOA		93	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG24008-005MD
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	15	14		1	98	12	70-150	30	08/04/2021 1736
11Cl-PF3OUdS	ND	15	15		1	100	7.9	70-150	30	08/04/2021 1736
8:2 FTS	ND	15	14		1	96	8.4	67-138	30	08/04/2021 1736
6:2 FTS	ND	15	19	+	1	129	65	64-140	30	08/04/2021 1736
4:2 FTS	ND	15	14		1	98	8.5	63-143	30	08/04/2021 1736
GenX	ND	31	28		1	89	5.9	70-150	30	08/04/2021 1736
ADONA	ND	15	16		1	110	2.1	70-150	30	08/04/2021 1736
EtFOSAA	ND	16	16		1	101	7.2	61-135	30	08/04/2021 1736
MeFOSAA	ND	16	17		1	110	1.4	65-136	30	08/04/2021 1736
PFBS	ND	14	15		1	108	2.8	72-130	30	08/04/2021 1736
PFDS	ND	15	14		1	91	9.3	53-142	30	08/04/2021 1736
PFHpS	ND	15	18		1	117	3.2	69-134	30	08/04/2021 1736
PFNS	ND	15	15		1	102	7.0	69-127	30	08/04/2021 1736
PFOSA	ND	16	17		1	107	15	67-137	30	08/04/2021 1736
PFPeS	ND	15	15		1	104	2.8	71-127	30	08/04/2021 1736
PFHxS	ND	14	20	N	1	142	26	68-131	30	08/04/2021 1736
PFBA	3.9	16	21		1	108	0.90	73-129	30	08/04/2021 1736
PFDA	ND	16	17		1	105	1.5	71-129	30	08/04/2021 1736
PFDoA	ND	16	17		1	106	3.4	72-134	30	08/04/2021 1736
PFHpA	ND	16	16		1	103	5.1	72-130	30	08/04/2021 1736
PFHxA	ND	16	20		1	129	26	72-129	30	08/04/2021 1736
PFNA	ND	16	17		1	105	2.0	69-130	30	08/04/2021 1736
PFOA	ND	16	18		1	115	2.3	71-133	30	08/04/2021 1736
PFPeA	ND	16	17		1	111	8.0	72-129	30	08/04/2021 1736
PFTeDA	ND	16	16		1	103	0.78	71-132	30	08/04/2021 1736
PFTrDA	ND	16	18		1	112	5.9	65-144	30	08/04/2021 1736
PFUdA	ND	16	19		1	120	8.7	69-133	30	08/04/2021 1736
PFOS	ND	15	23	N	1	159	30	65-140	30	08/04/2021 1736

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		123	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		75	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG24008-005MD
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		80	50-150
13C8_PFOA		96	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG24008

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC20-SW01-EF-072221	94	100	78	73	72	75	78	91	78
AOPC20-SW01-EF-072221	102	111	94	94	86	88	89	102	90
AOPC13-SW01-IN-072221	110	105	102	99	104	97	99	110	104
AOPC13-SW01-IN-072221	113	113	126	122	119	108	114	122	116
AOPC13-SW01-EF-072221	85	100	77	74	77	76	77	89	81
AOPC13-SW01-EF-072221-FD	90	114	84	73	78	82	79	93	83
AOPC15-SW01-EF-072321	89	109	78	71	76	79	71	89	81
AOPC15-SW01-IN-072321	93	86	81	74	74	78	74	84	84
AOPC15-SW01-IN-072321	102	95	91	87	83	78	83	96	91
WQ10417-001	81	87	75	71	78	78	74	78	82
WQ10417-002	81	85	86	72	74	76	82	79	78
AOPC15-SW01-EF-072321MS	95	110	77	76	81	81	76	97	85
AOPC15-SW01-EF-072321MSD	92	123	82	78	77	84	75	90	84

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG24008

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC20-SW01-EF-072221	79	78	82	79	81	85	79	81	
AOPC20-SW01-EF-072221	95	98	101	92	89	102	97	104	
AOPC13-SW01-IN-072221	102	102	101	99	107	106	106	109	
AOPC13-SW01-IN-072221	120	116	119	123	121	113	116	127	
AOPC13-SW01-EF-072221	79	82	80	81	84	93	74	80	
AOPC13-SW01-EF-072221-FD	81	83	85	77	86	97	83	82	
AOPC15-SW01-EF-072321	83	81	80	82	85	93	80	85	
AOPC15-SW01-IN-072321	83	76	82	82	80	86	75	79	
AOPC15-SW01-IN-072321	94	92	88	89	82	90	88	95	
WQ10417-001	76	79	85	73	77	80	74	81	
WQ10417-002	77	76	77	75	74	84	80	82	
AOPC15-SW01-EF-072321MS	87	85	86	82	83	93	76	87	
AOPC15-SW01-EF-072321MSD	83	81	86	83	80	96	84	81	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG24008

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC20-SW01-EF-072221	77	85	80						0
AOPC20-SW01-EF-072221	93	99	103						0
AOPC13-SW01-IN-072221	107	112	104						0
AOPC13-SW01-IN-072221	113	125	139						0
AOPC13-SW01-EF-072221	79	81	79						0
AOPC13-SW01-EF-072221-FD	79	94	84						0
AOPC15-SW01-EF-072321	80	86	77						0
AOPC15-SW01-IN-072321	77	78	80						0
AOPC15-SW01-IN-072321	90	94	100						0
WQ10417-001	82	87	84						0
WQ10417-002	78	79	81						0
AOPC15-SW01-EF-072321MS	86	90	83						0
AOPC15-SW01-EF-072321MSD	82	86	82						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

CLIENT SAMPLE ID

WQ10417-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG24008

Project No.: 103IG667601
Lab Sample ID: WQ10417-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/29/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/31/2021

Time Analyzed: 18:55

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC20-SW01-EF-072221	WG24008-001		16:43
AOPC20-SW01-EF-072221	WG24008-001		19:05
AOPC13-SW01-IN-072221	WG24008-002		19:54
AOPC13-SW01-IN-072221	WG24008-002		20:30
AOPC13-SW01-EF-072221	WG24008-003		16:54
AOPC13-SW01-EF-072221-FD	WG24008-004		17:04
AOPC15-SW01-EF-072321	WG24008-005		17:15
AOPC15-SW01-IN-072321	WG24008-006		18:40
AOPC15-SW01-IN-072321	WG24008-006		19:15
WQ10417-002	WQ10417-002		19:06
AOPC15-SW01-EF-072321MS	WG24008-005MS		17:25
AOPC15-SW01-EF-072321MSD	WG24008-005MD		17:36

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.613	3.212	3.254	3.512	3.519	3.439	3.450	3.423	3.453	3.406	3.428	3.170-3.867	0.11611	1.759
1 4:2 FTS	0.893	1.026	1.353	1.771	1.666	1.969	1.808	1.978	1.879	1.975	1.631	0.377-2.954	0.42965	0.833
15 PFHxA	14.031	13.128	25.058	19.778	19.670	18.684	18.332	17.826	18.587	16.968	18.206	10.298-29.041	3.12369	9.835
22 PFPeS	3.236	2.899	3.017	3.131	2.741	3.011	2.863	2.861	2.937	3.054	2.975	2.313-3.168	0.14244	1.370
28 GenX	0.743	0.771	0.796	0.756	0.792	0.778	0.802	0.762	0.801	0.801	0.780	0.730-0.853	0.02047	0.396
13 PFHpA	3.729	3.626	4.038	3.688	3.691	3.699	3.761	3.747	3.689	3.615	3.728	3.329-4.052	0.12053	1.845
14 PFHxS	3.013	2.850	2.943	2.837	3.053	3.270	3.250	3.163	2.987	3.051	3.041	2.597-3.508	0.15168	1.526
29 ADONA	3.008	2.930	3.121	3.020	3.078	3.024	3.133	2.998	3.054	2.887	3.025	2.823-3.332	0.08492	1.539
2 6:2 FTS	Disabled	1.603	1.602	1.986	1.824	1.966	1.821	1.888	1.888	1.794	1.819	1.414-2.233	0.13649	0.912
20 PFOA	2.682	3.014	2.640	3.017	2.883	2.685	2.898	2.853	3.040	2.880	2.859	2.421-3.344	0.15393	1.441
12 PFHpS	2.754	3.053	3.578	3.274	3.062	3.160	3.143	2.970	3.104	2.957	3.105	2.405-3.718	0.21869	1.531
18 PFOS	3.458	3.004	3.025	3.387	3.415	3.427	3.449	3.289	3.288	3.372	3.311	2.828-4.001	0.19534	1.707
17 PFNA	7.315	6.232	6.097	6.165	6.365	6.364	6.419	6.205	6.468	6.017	6.364	5.200-7.529	0.38823	3.182
19 PFOSA	69.990	52.330	34.668	27.726	28.473	32.713	32.270	32.526	30.906	30.582	37.218	-13.074-70.020	13.84911	14.236
16 PFNS	2.370	2.991	3.315	2.530	2.513	2.612	2.708	2.741	2.805	2.756	2.734	1.730-3.295	0.26096	1.256
10 PFDA	10.069	14.382	13.280	14.604	13.356	13.003	13.142	12.930	12.566	12.724	13.005	9.699-17.012	1.21871	6.678
3 8:2 FTS	1.577	1.517	1.982	1.945	1.968	2.064	1.988	1.857	1.848	2.011	1.875	1.329-2.606	0.21297	0.984
6 N-MeFOSAA	1.729	1.368	1.209	1.297	1.452	1.386	1.421	1.374	1.370	1.373	1.397	1.020-1.883	0.14393	0.726
9 PFDS	2.989	2.117	3.337	2.261	2.618	2.535	2.720	Disabled	Disabled	Disabled	2.653	1.432-3.803	0.39506	1.309
25 PFUdA	10.186	13.794	12.360	14.609	14.700	13.886	13.538	13.848	14.326	13.899	13.514	10.475-18.924	1.40814	7.350
5 N-EtFOSAA	3.441	1.648	1.914	1.385	1.447	1.704	1.510	1.704	1.566	1.711	1.803	-0.278-3.172	0.57502	0.723
26 MeFOSA	0.872	1.060	0.983	1.222	1.013	0.982	0.996	1.118	1.006	1.027	1.027	0.729-1.296	0.09451	0.506
27 EtFOSA	0.899	1.138	0.928	0.907	0.893	1.061	0.960	0.948	1.053	0.994	0.978	0.635-1.150	0.08599	0.446
11 PFDoA	17.404	11.511	9.422	10.673	10.018	10.373	10.714	10.193	10.249	10.510	11.106	3.257-16.778	2.25341	5.009
4 10:2 FTS	3.256	1.775	3.770	3.333	3.196	3.666	3.304	3.478	3.467	3.512	3.275	1.509-4.882	0.56222	1.598
34 PFDOS	3.580	2.776	3.093	2.779	3.093	3.074	2.931	3.077	3.134	3.223	3.076	2.399-3.786	0.23104	1.546
24 PFTrDA	8.158	8.335	8.011	7.623	8.030	7.860	7.857	8.081	8.143	7.615	7.971	7.303-8.756	0.24220	4.015
23 PFTeDA	11.812	12.137	10.917	11.359	11.304	11.364	11.381	11.748	11.166	10.899	11.408	10.099-12.508	0.40138	5.652
35 PFHxDA	11.601	11.103	9.130	10.834	10.453	10.404	10.497	10.396	10.280	10.369	10.506	8.526-12.379	0.64207	5.226
36 PFODA	14.446	12.290	13.663	13.457	13.351	13.158	13.254	13.055	12.911	12.657	13.224	11.594-15.107	0.58536	6.675

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	547	611	600	573	563	559	541	472	515	533	Avg:A Wt:C2	551		RSD=7.3	
	99.2	110.8	108.8	103.9	102.1	101.4	98	85.7	93.5	96.6	Org:N Dep:R				
8 PFBA	1.016419	1.005008	0.969197	0.979269	0.877172	0.939182	0.971835	0.977893	0.961911	0.944904	Avg:A Wt:C2	0.964279		RSD=4.0	
	105.4	104.2	100.5	101.6	91	97.4	100.8	101.4	99.8	98	Org:N Dep:R				
D 50 13C5_PFPeA	511	576	552	532	524	535	519	439	481	495	Avg:A Wt:C2	516		RSD=7.4	
	99	111.5	106.8	103	101.4	103.7	100.6	85	93.2	95.8	Org:N Dep:R				
21 PFPeA	1.142375	1.109055	1.059827	1.048168	0.941090	1.070071	1.082590	1.082854	1.057405	1.019366	Avg:A Wt:C2	1.061280		RSD=5.1	
	107.6	104.5	99.9	98.8	88.7	100.8	102	102	99.6	96.1	Org:N Dep:R				
D 44 13C3_PFBS	169	196	188	179	169	176	182	140	164	172	Avg:A Wt:C2	174		RSD=8.8	
	97.1	113.1	108.2	103	97.5	101.6	105.1	80.7	94.3	99.3	Org:N Dep:R				
7 PFBS	1.381732	1.255550	1.302964	1.288405	1.228942	1.263662	1.236027	1.381835	1.313330	1.276973	Avg:A Wt:C2	1.292942		RSD=4.2	
	106.9	97.1	100.8	99.6	95.1	97.7	95.6	106.9	101.6	98.8	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 63 13C2_4:2 FTS_2	20.0656	22.1628	21.5058	21.9484	18.0392	19.9862	19.3008	17.9994	18.5994	19.7510	Avg:A Wt:C2	19.9359		RSD=7.7	
	100.7	111.2	107.9	110.1	90.5	100.3	96.8	90.3	93.3	99.1	Org:N Dep:R				
1 4:2 FTS	1.969984	2.018352	1.754668	1.950750	2.148070	2.269259	2.125729	1.914512	1.994807	2.055682	Avg:A Wt:C2	2.020181		RSD=7.0	
	97.5	99.9	86.9	96.6	106.3	112.3	105.2	94.8	98.7	101.8	Org:N Dep:R				
D 49 13C5_PFHxA	606	659	647	645	600	624	619	499	541	589	Avg:A Wt:C2	603		RSD=8.3	
	100.5	109.3	107.3	107	99.5	103.5	102.6	82.8	89.7	97.7	Org:N Dep:R				
15 PFHxA	1.136456	0.970051	1.105495	1.009838	0.939058	1.016957	0.974863	1.065629	1.065952	0.937937	Avg:A Wt:C2	1.022224		RSD=6.8	
	111.2	94.9	108.1	98.8	91.9	99.5	95.4	104.2	104.3	91.8	Org:N Dep:R				
22 PFPeS	1.040990	0.872468	0.901285	0.964537	0.925005	0.938154	0.879388	0.995855	0.895449	0.933551	Avg:A Wt:C2	0.934668		RSD=5.7	
	111.4	93.3	96.4	103.2	99	100.4	94.1	106.5	95.8	99.9	Org:N Dep:R				
28 GenX	0.694514	0.706749	0.711356	0.656646	0.698709	0.700657	0.679510	0.647892	0.680289	0.709347	Avg:A Wt:C2	0.688567		RSD=3.2	
	100.9	102.6	103.3	95.4	101.5	101.8	98.7	94.1	98.8	103	Org:N Dep:R				
D 66 13C3_GenX	212	240	236	225	200	208	215	190	206	198	Avg:A Wt:C2	213		RSD=7.7	
	99.6	112.8	110.8	105.5	94	97.4	100.7	89.4	96.8	93	Org:N Dep:R				
13 PFHpA	1.286509	1.178728	1.131168	1.130533	1.008084	1.081766	1.064985	1.080324	1.138289	1.113823	Avg:A Wt:C2	1.121421		RSD=6.7	
	114.7	105.1	100.9	100.8	89.9	96.5	95	96.3	101.5	99.3	Org:N Dep:R				
D 47 13C4_PFHpA	492	543	527	513	483	474	503	425	434	456	Avg:A Wt:C2	485		RSD=8.0	
	101.4	112	108.7	105.8	99.5	97.7	103.7	87.6	89.5	94	Org:N Dep:R				
D 45 13C3_PFHxS	146	153	151	151	138	146	142	109	122	130	Avg:A Wt:C2	139		RSD=10.4	
	105.5	110.2	108.9	108.6	99.1	105.4	102.5	78.6	87.7	93.5	Org:N Dep:R				
14 PFHxS	1.121227	1.085313	1.008377	1.043022	1.013859	1.034529	1.038313	1.150037	1.122995	1.090854	Avg:A Wt:C2	1.070853		RSD=4.7	
	104.7	101.4	94.2	97.4	94.7	96.6	97	107.4	104.9	101.9	Org:N Dep:R				
29 ADONA	6.792623	6.160722	6.316662	5.993784	5.749857	5.987295	6.069684	6.511944	6.645386	6.159051	Avg:A Wt:C2	6.238701		RSD=5.2	
	108.9	98.8	101.2	96.1	92.2	96	97.3	104.4	106.5	98.7	Org:N Dep:R				
2 6:2 FTS	Disabled	3.574242	3.490726	2.866088	2.538598	2.523102	2.760954	2.660239	2.538669	2.431365	Avg:A Wt:C2	2.820442		RSD=15.1	
	Disabled	126.7	123.8	101.6	90	89.5	97.9	94.3	90	86.2	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	16.1862	17.3062	18.3352	16.0446	15.4642	17.2064	13.8766	13.1698	14.7236	14.5148	Avg:A Wt:C2	15.6828		RSD=10.5	
	103.2	110.4	116.9	102.3	98.6	109.7	88.5	84	93.9	92.6	Org:N Dep:R				
D 53 13C8_PFOA	507	557	550	516	539	488	514	399	425	452	Avg:A Wt:C2	495		RSD=10.8	
	102.6	112.6	111.2	104.2	108.9	98.6	103.9	80.6	85.8	91.5	Org:N Dep:R				
20 PFOA	1.015673	0.954395	0.968422	0.961601	0.805359	0.967654	0.914120	0.960996	1.022079	0.924109	Avg:A Wt:C2	0.949441		RSD=6.4	
	107	100.5	102	101.3	84.8	101.9	96.3	101.2	107.7	97.3	Org:N Dep:R				
12 PFHpS	1.072621	0.975748	0.993382	0.911480	0.941168	0.969310	0.970020	1.036016	0.992607	0.945489	Avg:A Wt:C2	0.980784		RSD=4.8	
	109.4	99.5	101.3	92.9	96	98.8	98.9	105.6	101.2	96.4	Org:N Dep:R				
D 54 13C8_PFOS	137	158	156	136	140	145	139	112	132	139	Avg:A Wt:C2	139		RSD=9.3	
	98.1	113.4	112	97.7	100.5	103.9	99.5	80.1	94.7	100.1	Org:N Dep:R				
18 PFOS	1.578661	1.256972	1.000883	1.166541	1.036035	1.115945	1.144211	1.206493	1.103505	1.134872	Ln:A Wt:C2	1.093775	19.2285	R^2=0.992	
	106.4	96	82	102.9	92.8	101.1	104.2	110.1	100.8	103.7	Org:N Dep:R			RSE=8.5	
D 56 13C9_PFNA	625	675	643	627	619	632	609	526	549	585	Avg:A Wt:C2	609		RSD=7.3	
	102.7	110.9	105.5	102.9	101.6	103.8	100	86.3	90.2	96.1	Org:N Dep:R				
17 PFNA	1.211027	1.087750	1.056915	1.012170	0.943876	1.098155	1.021197	1.020035	1.056310	1.027970	Avg:A Wt:C2	1.053541		RSD=6.7	
	114.9	103.2	100.3	96.1	89.6	104.2	96.9	96.8	100.3	97.6	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.688737	3.285706	3.460432	3.845645	3.154403	3.493060	3.522847	4.062284	3.824058	3.722494	Avg:A Wt:C2	3.605967		RSD=7.6	
	102.3	91.1	96	106.6	87.5	96.9	97.7	112.7	106	103.2	Org:N Dep:R				
D 55 13C8_PFOSA	275	295	290	270	250	293	260	229	250	259	Avg:A Wt:C2	267		RSD=8.1	
	103	110.6	108.5	101	93.6	109.7	97.4	85.6	93.5	97.1	Org:N Dep:R				
19 PFOSA	1.105052	1.151548	0.991587	1.047427	1.090677	0.984879	1.000929	1.088139	1.091422	1.131345	Avg:A Wt:C2	1.068300		RSD=5.5	
	103.4	107.8	92.8	98	102.1	92.2	93.7	101.9	102.2	105.9	Org:N Dep:R				
16 PFNS	0.885752	0.729123	0.814794	0.808249	0.682093	0.784107	0.795145	0.885268	0.800149	0.781390	Avg:A Wt:C2	0.796607		RSD=7.8	
	111.2	91.5	102.3	101.5	85.6	98.4	99.8	111.1	100.4	98.1	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	17.8008	19.2204	19.3660	17.3986	14.4364	17.0066	16.8702	15.2824	16.6032	15.2764	Avg:A Wt:C2	16.9261		RSD=9.6	
	105.2	113.6	114.4	102.8	85.3	100.5	99.7	90.3	98.1	90.3	Org:N Dep:R				
10 PFDA	1.121987	1.091406	1.113959	1.087910	0.978715	1.120213	1.017481	1.097764	1.007865	1.020853	Avg:A Wt:C2	1.065815		RSD=5.0	
	105.3	102.4	104.5	102.1	91.8	105.1	95.5	103	94.6	95.8	Org:N Dep:R				
D 51 13C6_PFDA	603	658	666	609	591	587	608	491	532	555	Avg:A Wt:C2	590		RSD=9.1	
	102.3	111.5	112.9	103.3	100.1	99.4	103.1	83.2	90.2	94	Org:N Dep:R				
3 8:2 FTS	2.236535	2.068088	2.664043	2.264118	2.622474	2.487061	2.318105	2.066044	2.035501	2.214282	Avg:A Wt:C2	2.297625		RSD=9.9	
	97.3	90	115.9	98.5	114.1	108.2	100.9	89.9	88.6	96.4	Org:N Dep:R				
D 58 d3-MeFOSAA	131	136	148	123	120	139	127	123	148	141	Avg:A Wt:C2	133		RSD=7.6	
	97.8	102.1	110.6	92.2	90.2	104.2	95	92	110.6	105.3	Org:N Dep:R				
6 N-MeFOSAA	0.982031	0.877342	0.661060	0.696446	0.771956	0.772451	0.801981	0.743534	0.722426	0.784505	Avg:A Wt:C2	0.781373		RSD=11.8	
	125.7	112.3	84.6	89.1	98.8	98.9	102.6	95.2	92.5	100.4	Org:N Dep:R				
9 PFDS	1.094012	0.676181	0.766211	0.756593	0.723345	0.739213	0.781721	Disabled	Disabled	Disabled	Ln:A Wt:C	0.759859	5.436781	R^2=0.997	
	129.1	81.6	97.1	98.1	94.5	96.9	102.7	Disabled	Disabled	Disabled	Org:N Dep:R			RSE=15.8	
D 52 13C7_PFUdA	705	716	747	634	708	721	634	527	562	617	Avg:A Wt:C2	657		RSD=11.3	
	107.3	108.9	113.8	96.5	107.7	109.7	96.5	80.2	85.5	93.9	Org:N Dep:R				
D 60 d5-EtFOSAA	120	132	131	120	104	123	113	93.8996	105	107	Avg:A Wt:C2	115		RSD=10.8	
	104	115	113.8	104.8	90.7	106.8	98.7	81.7	91.5	92.8	Org:N Dep:R				
25 PFUdA	0.821472	0.962352	0.858297	0.977931	0.780823	0.847434	0.879772	0.930643	0.924546	0.862079	Avg:A Wt:C2	0.884535		RSD=7.1	
	92.9	108.8	97	110.6	88.3	95.8	99.5	105.2	104.5	97.5	Org:N Dep:R				
5 N-EtFOSAA	1.198909	0.961713	0.892920	0.867371	0.965256	1.028107	1.003115	1.013985	0.973630	1.016873	Avg:A Wt:C2	0.992188		RSD=9.1	
	120.8	96.9	90	87.4	97.3	103.6	101.1	102.2	98.1	102.5	Org:N Dep:R				
D 61 d7-MeFOSE	72.5780	83.3930	78.7110	74.4230	68.2950	72.5570	78.6500	69.2240	75.2560	78.0920	Avg:A Wt:C2	75.1179		RSD=6.2	
	96.6	111	104.8	99.1	90.9	96.6	104.7	92.2	100.2	104	Org:N Dep:R				
32 MeFOSE	1.199537	1.109925	1.261958	1.027478	1.123801	1.247495	1.098197	1.108855	1.089627	1.163942	Avg:A Wt:C2	1.143082		RSD=6.5	
	104.9	97.1	110.4	89.9	98.3	109.1	96.1	97	95.3	101.8	Org:N Dep:R				
D 57 d3-MeFOSA	45.9100	50.8680	49.2480	47.4650	40.7770	50.6270	47.8650	48.3890	57.2100	53.6180	Avg:A Wt:C2	49.1977		RSD=9.0	
	93.3	103.4	100.1	96.5	82.9	102.9	97.3	98.4	116.3	109	Org:N Dep:R				
26 MeFOSA	0.715313	0.916097	1.160453	1.107427	1.070285	1.011565	1.028426	0.962248	0.886511	0.982414	Avg:A Wt:C2	0.984074		RSD=12.8	
	72.7	93.1	117.9	112.5	108.8	102.8	104.5	97.8	90.1	99.8	Org:N Dep:R				
31 11Cl-PF3OUDS	3.404397	3.058323	3.010505	3.467293	3.029313	3.086520	3.133430	3.605481	3.180048	3.207502	Avg:A Wt:C2	3.218281		RSD=6.4	
	105.8	95	93.5	107.7	94.1	95.9	97.4	112	98.8	99.7	Org:N Dep:R				
D 62 d9-EtFOSE	83.2060	83.3240	80.1150	80.0420	68.4520	79.8740	80.7840	71.5570	74.6630	80.7740	Avg:A Wt:C2	78.2791		RSD=6.4	
	106.3	106.4	102.3	102.3	87.4	102	103.2	91.4	95.4	103.2	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	1.277071	1.196774	1.459964	1.175608	1.200359	1.117648	1.066810	1.096601	1.155936	1.168089	Avg:A Wt:C2	1.191486		RSD=9.3	
	107.2	100.4	122.5	98.7	100.7	93.8	89.5	92	97	98	Org:N Dep:R				
D 59 d5-EtFOSA	36.8070	47.1340	45.7690	40.0380	38.0250	41.1440	44.9320	38.0390	38.8640	44.7100	Avg:A Wt:C2	41.5462		RSD=9.1	
	88.6	113.4	110.2	96.4	91.5	99	108.1	91.6	93.5	107.6	Org:N Dep:R				
27 EtFOSA	1.488847	1.335978	1.069938	0.935911	1.094701	1.164738	0.992433	1.043006	1.161999	1.009442	Ln:A Wt:C2	1.042367	22.4410	R^2=0.991	
	99.8	106.6	91.9	85.5	102.9	110.7	94.8	99.8	111.3	96.7	Org:N Dep:R			RSE=8.7	
D 38 13C2_PFDoA	751	764	824	766	745	775	783	624	709	683	Avg:A Wt:C2	742		RSD=7.6	
	101.1	103	111	103.2	100.4	104.4	105.4	84.1	95.5	92.1	Org:N Dep:R				
11 PFDoA	1.203071	1.047758	1.013770	1.051741	0.942380	0.997848	1.014622	0.951126	0.927553	0.979381	Avg:A Wt:C2	1.012925		RSD=7.8	
	118.8	103.4	100.1	103.8	93	98.5	100.2	93.9	91.6	96.7	Org:N Dep:R				
4 10:2 FTS	3.962711	3.502179	5.322242	4.214461	4.683226	4.379310	4.094197	3.691728	3.624328	3.941042	Avg:A Wt:C2	4.141542		RSD=13.2	
	95.7	84.6	128.5	101.8	113.1	105.7	98.9	89.1	87.5	95.2	Org:N Dep:R				
34 PFDOS	0.961646	0.688365	0.788200	0.850372	0.773104	0.799596	0.843411	0.921802	0.879031	0.871188	Avg:A Wt:C2	0.837672		RSD=9.4	
	114.8	82.2	94.1	101.5	92.3	95.5	100.7	110	104.9	104	Org:N Dep:R				
24 PFTrDA	0.865096	0.889027	0.795691	0.800220	0.751036	0.797844	0.728467	0.822240	0.790279	0.792006	Avg:A Wt:C2	0.803191		RSD=5.9	
	107.7	110.7	99.1	99.6	93.5	99.3	90.7	102.4	98.4	98.6	Org:N Dep:R				
D 42 13C2_PFTeDA	857	906	910	886	846	885	881	766	853	960	Avg:A Wt:C2	875		RSD=5.8	
	98	103.5	104	101.2	96.7	101.1	100.7	87.6	97.4	109.7	Org:N Dep:R				
23 PFTeDA	0.875457	0.856690	0.821765	0.825215	0.748464	0.812728	0.806877	0.795894	0.788051	0.724492	Avg:A Wt:C2	0.805563		RSD=5.6	
	108.7	106.3	102	102.4	92.9	100.9	100.2	98.8	97.8	89.9	Org:N Dep:R				
D 40 13C2_PFHxDA	814	874	870	879	769	848	862	733	852	871	Avg:A Wt:C2	837		RSD=5.9	
	97.2	104.4	103.9	105	91.8	101.3	102.9	87.6	101.8	104	Org:N Dep:R				
35 PFHxDA	0.733171	0.654204	0.619485	0.586008	0.582836	0.580047	0.560434	0.571437	0.543605	0.544164	Avg:A Wt:C2	0.597539		RSD=9.8	
	122.7	109.5	103.7	98.1	97.5	97.1	93.8	95.6	91	91.1	Org:N Dep:R				
36 PFODA	1.009160	0.905721	0.933082	0.896012	0.910934	0.899798	0.900502	0.921096	0.877661	0.858878	Avg:A Wt:C2	0.911284		RSD=4.4	
	110.7	99.4	102.4	98.3	100	98.7	98.8	101.1	96.3	94.2	Org:N Dep:R				

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	664657	698745	719376	661837	592352	636307	624788	525891	605736	631298	1.28
* 39 13C2_PFHxA	625107	644196	668847	652725	582381	657478	598734	516865	562139	590710	1.41
* 41 13C2_PFOA	529331	570233	575643	538819	516348	530663	516445	442186	454391	469502	2.99
* 43 13C3_PFBA	495400	543881	539827	529552	474184	502696	494309	440120	466568	479357	0.82
* 48 13C4_PFOS	137646	151522	150490	136409	126954	145871	137216	109022	123534	136345	0.23

13C2_PFDA ((|631298 - 664657| / (631298 + 664657)) / 2) * 100 = 1.29

13C2_PFHxA ((|590710 - 625107| / (590710 + 625107)) / 2) * 100 = 1.41

13C2_PFOA ((|469502 - 529331| / (469502 + 529331)) / 2) * 100 = 2.99

13C3_PFBA ((|479357 - 495400| / (479357 + 495400)) / 2) * 100 = 0.82

13C4_PFOS ((|136345 - 137646| / (136345 + 137646)) / 2) * 100 = 0.24

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	546861	611000	599976	573156	563032	559024	540622	472283	515476	532517	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	27792	61406	116299	280637	493876	1050051	2626976	4618423	7437630	10063548	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	511058	575526	551519	531930	523546	535244	519236	438943	481475	494900	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	29191	63829	116903	278776	492704	1145498	2810598	4753112	7636713	10089689	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	168570	196377	187768	178777	169277	176333	182475	140086	163595	172404	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	10295	21796	43255	101809	183900	393955	996905	1711209	2848967	3892346	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	100328	110814	107529	109742	90196	99931	96504	89997	92997	98755	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	1846	4178	7049	19995	36192	84721	191602	321857	519802	758441	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	606218	659089	647271	645478	600114	624153	618656	499241	541057	589408	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	625107	644196	668847	652725	582381	657478	598734	516865	562139	590710	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	34447	63935	143111	325914	563542	1269473	3015523	5320058	8651109	11056552	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	8230	16071	31748	80873	146874	310342	752587	1308560	2061129	3019383	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	14733	33958	67171	147510	279651	581605	1457690	2465817	4208040	5617453	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1060670	1201204	1180333	1123208	1000599	1037606	1072603	951477	1030944	989899	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	31646	64035	119317	290119	486690	1024742	2677910	4590070	7410037	10153232	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	491967	543255	527406	513243	482787	473643	502901	424879	433987	455783	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	146484	153093	151195	150796	137682	146445	142331	109122	121799	129872	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	7473	15120	27748	71564	127027	275733	672418	1141998	1867043	2578419	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	46865	88846	179931	425708	745736	1651909	4068989	6693818	11436842	15069894	
2 6:2 FTS	Disabled	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	Disabled	5864	12135	21797	37216	82312	181602	332130	531520	669113	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	80931	86531	91676	80223	77321	86032	69383	65849	73618	72574	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	529331	570233	575643	538819	516348	530663	516445	442186	454391	469502	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	507486	557306	550354	515742	538966	487751	513973	399015	424537	452495	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	25772	53189	106595	247969	434061	943948	2349164	3834519	6508653	8363090	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	7479	14221	28597	65425	123362	270274	657184	1076256	1726431	2337970	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	136560	157938	156053	136027	139992	144663	138558	111576	131902	139484	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	137646	151522	150490	136409	126954	145871	137216	109022	123534	136345	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	10003	18423	28989	73628	134594	299625	735624	1249233	2026119	2937984	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	625469	675477	642980	626954	618881	632127	609273	525981	549315	585461	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	37873	73475	135915	317292	584147	1388347	3110938	5365192	8703707	12036723	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	23474	48365	100658	243770	411563	941910	2274633	4224322	7051525	9678417	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	274883	295385	289667	269529	250019	292812	260109	228568	249606	259213	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	15188	34015	57446	141156	272690	576769	1301753	2487137	4086381	5865187	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	5806	11055	24413	52773	91668	217788	528834	948237	1519794	2092634	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	89004	96102	96830	86993	72182	85033	84351	76412	83016	76382	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	33854	71781	148329	331458	577932	1314178	3094369	5385157	8039433	11323896	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	664657	698745	719376	661837	592352	636307	624788	525891	605736	631298	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	603465	657693	665774	609348	590501	586575	608241	490557	531780	554629	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1907	3808	9885	18869	36269	81040	187322	302480	485646	648111	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	652831	681319	738360	615697	601725	695403	633865	614018	738160	702845	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	6411	11955	19524	42880	92901	214866	508348	913087	1599797	2205543	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	Disabled	Disabled	Disabled	#54
	7201	10295	23053	49606	97617	206174	522072	Disabled	Disabled	Disabled	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	704613	715580	747498	633789	707587	720614	633568	526954	561767	616790	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	597877	660852	654230	602499	521292	613448	567342	469498	525972	533502	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	28941	68864	128315	309901	552500	1221346	2786976	4904060	7790693	10634436	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7168	12711	23367	52259	100636	252276	569109	952128	1536307	2170015	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	72578	83393	78711	74423	68295	72557	78650	69224	75256	78092	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	4353	9256	19866	38234	76750	181029	431866	767594	1230014	1817891	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	45910	50868	49248	47465	40777	50627	47865	48389	57210	53618	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	1642	4660	11430	26282	43643	102425	246128	465622	760759	1053502	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	21897	45501	88510	222145	399483	841216	2044902	3789526	5926895	8428925	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	83206	83324	80115	80042	68452	79874	80784	71557	74663	80774	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	5313	9972	23393	47049	82167	178542	430906	784695	1294585	1887024	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	36807	47134	45769	40038	38025	41144	44932	38039	38864	44710	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2740	6297	9794	18736	41626	95844	222960	396749	677399	902643	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	750529	764375	823994	766014	745164	774776	782694	624240	709060	683408	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	45147	80088	167068	402824	702228	1546218	3970694	5937306	9865365	13386339	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3400	6489	19872	35343	65175	143592	332917	543874	870137	1160751	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	6356	10524	23813	55986	104765	223941	565609	995597	1683536	2352565	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	32464	67955	131129	306490	559645	1236301	2850833	5132753	8405331	10825266	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	857358	906057	909992	885835	846373	884540	880859	766250	852681	960299	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	37529	77621	149560	365502	633480	1437780	3553725	6098540	10079344	13914583	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	813944	874055	869763	879100	768834	848036	861669	732913	851921	870576	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	29838	57181	107761	257580	448104	983802	2414543	4188135	6946632	9474720	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41070	79165	162312	393842	700357	1526123	3879673	6750830	11215472	14954365	

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.749	1.749	1.742	1.749	1.743	1.743	1.749	1.756	1.750	1.749	1.748	0.253
8 PFBA	1.749	1.756	1.749	1.756	1.749	1.749	1.756	1.756	1.756	1.756	1.753	0.191
D 50 13C5_PFPeA	2.056	2.045	2.055	2.045	2.045	2.045	2.045	2.045	2.045	2.055	2.048	0.240
21 PFPeA	2.056	2.045	2.055	2.045	2.045	2.045	2.045	2.045	2.045	2.055	2.048	0.240
D 44 13C3_PFBS	2.087	2.077	2.087	2.077	2.087	2.087	2.077	2.088	2.088	2.087	2.084	0.245
7 PFBS	2.098	2.077	2.087	2.077	2.087	2.087	2.077	2.088	2.088	2.087	2.085	0.316
D 63 13C2_4:2 FTS_2	2.317	2.300	2.316	2.300	2.308	2.308	2.291	2.308	2.308	2.317	2.307	0.363
1 4:2 FTS	2.326	2.300	2.316	2.300	2.317	2.308	2.291	2.308	2.308	2.308	2.308	0.426
D 49 13C5_PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
* 39 13C2_PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
15 PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
22 PFPeS	2.370	2.353	2.370	2.353	2.361	2.362	2.344	2.362	2.362	2.370	2.360	0.374
28 GenX	2.451	2.424	2.450	2.424	2.441	2.442	2.415	2.433	2.433	2.442	2.435	0.476
D 66 13C3_GenX	2.451	2.424	2.450	2.424	2.441	2.442	2.415	2.433	2.433	2.442	2.435	0.476
13 PFHpA	2.681	2.654	2.681	2.645	2.672	2.672	2.645	2.663	2.672	2.681	2.666	0.529
D 47 13C4_PFHpA	2.681	2.645	2.681	2.645	2.672	2.672	2.645	2.663	2.672	2.672	2.664	0.544
D 45 13C3_PFHxS	2.690	2.654	2.690	2.654	2.681	2.681	2.645	2.672	2.681	2.690	2.674	0.632
14 PFHxS	2.690	2.654	2.690	2.654	2.681	2.681	2.654	2.672	2.681	2.690	2.674	0.573
29 ADONA	2.718	2.681	2.717	2.681	2.708	2.709	2.681	2.700	2.709	2.708	2.701	0.540
2 6:2 FTS	Disabled	2.975	3.011	2.987	3.005	3.012	2.987	3.012	3.027	3.032	3.005	0.623
D 64 13C2_6:2 FTS_2	3.020	2.981	3.011	2.987	3.005	3.012	2.987	3.012	3.027	3.032	3.007	0.570
* 41 13C2_PFOA	3.041	3.006	3.038	3.012	3.025	3.039	3.012	3.034	3.047	3.052	3.030	0.533
D 53 13C8_PFOA	3.041	3.006	3.032	3.012	3.025	3.039	3.012	3.034	3.047	3.052	3.029	0.525
20 PFOA	3.047	3.012	3.038	3.012	3.025	3.039	3.012	3.041	3.047	3.052	3.032	0.529
12 PFHpS	3.047	3.006	3.038	3.018	3.032	3.039	3.012	3.041	3.054	3.059	3.034	0.586
D 54 13C8_PFOS	3.403	3.374	3.394	3.394	3.394	3.402	3.402	3.418	3.433	3.438	3.405	0.575
* 48 13C4_PFOS	3.411	3.374	3.401	3.394	3.394	3.402	3.394	3.418	3.433	3.438	3.405	0.575
18 PFOS	3.411	3.374	3.401	3.394	3.394	3.409	3.402	3.426	3.433	3.438	3.408	0.580
D 56 13C9_PFNA	3.418	3.381	3.401	3.402	3.401	3.409	3.402	3.433	3.440	3.446	3.413	0.602
17 PFNA	3.411	3.381	3.408	3.402	3.401	3.409	3.402	3.433	3.448	3.446	3.414	0.624
30 9Cl-PF3ONS	3.609	3.585	3.598	3.615	3.606	3.615	3.615	3.639	3.651	3.649	3.618	0.604
D 55 13C8_PFOSA	3.705	3.679	3.695	3.717	3.710	3.710	3.717	3.740	3.746	3.751	3.717	0.615
19 PFOSA	3.719	3.679	3.695	3.717	3.710	3.710	3.717	3.733	3.753	3.751	3.718	0.616

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.746	3.726	3.737	3.752	3.744	3.752	3.758	3.775	3.790	3.787	3.756	0.561
D 65 13C2_8:2 FTS_2	3.753	3.726	3.737	3.759	3.751	3.752	3.758	3.782	3.798	3.795	3.761	0.630
10 PFDA	3.760	3.733	3.751	3.766	3.758	3.759	3.765	3.790	3.806	3.803	3.769	0.624
* 37 13C2_PFDA	3.760	3.733	3.744	3.766	3.758	3.765	3.765	3.790	3.798	3.803	3.768	0.601
D 51 13C6_PFDA	3.753	3.733	3.744	3.766	3.758	3.759	3.765	3.782	3.798	3.803	3.766	0.595
3 8:2 FTS	3.760	3.733	3.744	3.759	3.758	3.759	3.758	3.782	3.798	3.795	3.764	0.557
D 58 d3-MeFOSAA	3.912	3.887	3.901	3.918	3.917	3.918	3.926	3.945	3.954	3.960	3.923	0.591
6 N-MeFOSAA	3.912	3.895	3.909	3.926	3.926	3.918	3.926	3.945	3.963	3.960	3.928	0.567
9 PFDS	4.045	4.027	4.040	4.068	4.058	4.059	4.068	Disabled	Disabled	Disabled	4.051	0.379
D 52 13C7_PFUdA	4.062	4.044	4.058	4.085	4.076	4.068	4.086	4.098	4.106	4.120	4.080	0.575
D 60 d5-EtFOSAA	4.062	4.044	4.058	4.094	4.085	4.076	4.095	4.107	4.115	4.120	4.085	0.622
25 PFUdA	4.062	4.044	4.058	4.085	4.085	4.076	4.086	4.107	4.115	4.120	4.083	0.612
5 N-EtFOSAA	4.071	4.053	4.058	4.094	4.093	4.076	4.095	4.116	4.115	4.129	4.090	0.618
D 61 d7-MeFOSE	4.124	4.106	4.120	4.157	4.147	4.139	4.157	4.169	4.169	4.182	4.146	0.587
32 MeFOSE	4.133	4.115	4.129	4.165	4.156	4.148	4.166	4.178	4.186	4.192	4.156	0.611
D 57 d3-MeFOSA	4.142	4.124	4.138	4.174	4.164	4.156	4.175	4.187	4.196	4.201	4.165	0.613
26 MeFOSA	4.151	4.133	4.138	4.183	4.173	4.156	4.175	4.187	4.196	4.201	4.169	0.568
31 11Cl-PF3OUDS	4.206	4.178	4.191	4.233	4.221	4.213	4.234	4.237	4.247	4.252	4.221	0.570
D 62 d9-EtFOSE	4.287	4.267	4.282	4.324	4.313	4.304	4.314	4.328	4.338	4.342	4.309	0.579
33 EtFOSE	4.298	4.277	4.292	4.334	4.323	4.314	4.335	4.338	4.347	4.352	4.321	0.576
D 59 d5-EtFOSA	4.308	4.287	4.302	4.344	4.333	4.314	4.335	4.347	4.357	4.361	4.328	0.571
27 EtFOSA	4.318	4.287	4.302	4.344	4.342	4.324	4.344	4.357	4.357	4.370	4.334	0.599
D 38 13C2_PFDoA	4.328	4.307	4.322	4.363	4.352	4.344	4.363	4.375	4.375	4.386	4.351	0.592
11 PFDoA	4.338	4.307	4.322	4.363	4.352	4.344	4.363	4.375	4.375	4.386	4.352	0.572
4 10:2 FTS	4.347	4.317	4.332	4.372	4.370	4.353	4.372	4.383	4.390	4.394	4.363	0.569
34 PFDOS	4.544	4.508	4.513	4.566	4.565	4.541	4.566	4.569	4.577	4.582	4.553	0.565
24 PFTrDA	4.561	4.535	4.549	4.591	4.590	4.574	4.591	4.594	4.602	4.607	4.579	0.531
D 42 13C2_PFTeDA	4.769	4.728	4.738	4.792	4.786	4.766	4.792	4.794	4.800	4.803	4.776	0.546
23 PFTeDA	4.769	4.735	4.738	4.792	4.786	4.766	4.792	4.794	4.800	4.803	4.777	0.516
D 40 13C2_PFHxDA	5.128	5.081	5.091	5.145	5.139	5.115	5.145	5.146	5.152	5.156	5.130	0.509
35 PFHxDA	5.128	5.081	5.091	5.151	5.145	5.121	5.145	5.146	5.152	5.156	5.131	0.517
36 PFODA	5.489	5.440	5.444	5.514	5.507	5.472	5.507	5.502	5.517	5.514	5.490	0.531

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B028.d
Injection Date: 23-Jul-2021 01:14:35 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC- 1577 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	697063			123.8	50 - 150
8 PFBA			500.00	412.81	82.6	70 - 130
D 50 13C5_PFPeA	523546	646174			123.4	50 - 150
21 PFPeA			500.00	413.60	82.7	70 - 130
7 PFBS			442.50	374.28	84.6	70 - 130
D 44 13C3_PFBS	169277	219583			129.7	50 - 150
D 63 13C2_4:2 FTS_2	90196	109973			121.9	50 - 150
1 4:2 FTS			467.50	512.75	109.7	70 - 130
D 49 13C5_PFHxA	600114	753591			125.6	50 - 150
15 PFHxA			500.00	402.35	80.5	70 - 130
22 PFPeS			470.00	393.01	83.6	70 - 130
28 GenX			2500.00	2196.01	87.8	70 - 130
D 66 13C3_GenX	1000599	1205811			120.5	50 - 150
D 47 13C4_PFHpA	482787	629323			130.4	50 - 150
13 PFHpA			500.00	403.53	80.7	70 - 130
D 45 13C3_PFHxS	137682	162385			117.9	50 - 150
14 PFHxS			456.00	378.36	83	70 - 130
29 ADONA			2355.00	2154.64	91.5	70 - 130
D 64 13C2_6:2 FTS_2	77321	92003			119	50 - 150
2 6:2 FTS			475.00	376.51	79.3	70 - 130
20 PFOA			500.00	424.92	85	70 - 130
D 53 13C8_PFOA	538966	589571			109.4	50 - 150
12 PFHpS			475.00	416.18	87.6	70 - 130
18 PFOS			462.75	397.81	86	70 - 130
D 54 13C8_PFOS	139992	170702			121.9	50 - 150
17 PFNA			500.00	381.86	76.4	70 - 130
D 56 13C9_PFNA	618881	769275			124.3	50 - 150
30 9Cl-PF3ONS			2330.00	1889.62	81.1	70 - 130
D 55 13C8_PFOSA	250019	323061			129.2	50 - 150
19 PFOSA			500.00	433.98	86.8	70 - 130
16 PFNS			480.00	405.71	84.5	70 - 130
D 65 13C2_8:2 FTS_2	72182	102430			141.9	50 - 150
10 PFDA			500.00	440.32	88.1	70 - 130
3 8:2 FTS			480.00	469.71	97.9	70 - 130
D 51 13C6_PFDA	590501	740625			125.4	50 - 150
D 58 d3-MeFOSAA	601725	791178			131.5	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	534.50	106.9	70 - 130
9 PFDS			482.50	416.99	86.4	70 - 130
D 52 13C7_PFUdA	707587	862142			121.8	50 - 150
25 PFUdA			500.00	410.40	82.1	70 - 130
D 60 d5-EtFOSAA	521292	662875			127.2	50 - 150
5 N-EtFOSAA			500.00	547.14	109.4	70 - 130
D 61 d7-MeFOSE	68295	98617			144.4	50 - 150
D 57 d3-MeFOSA	40777	55738			136.7	50 - 150
31 11Cl-PF3OUDS			2355.00	1917.40	81.4	70 - 130
D 62 d9-EtFOSE	68452	89797			131.2	50 - 150
D 59 d5-EtFOSA	38025	50890			133.8	50 - 150
11 PFDoA			500.00	395.66	79.1	70 - 130
D 38 13C2_PFDoA	745164	941425			126.3	50 - 150
4 10:2 FTS			2410.00	2228.22	92.5	70 - 130
24 PFTrDA			500.00	449.20	89.8	70 - 130
23 PFTeDA			500.00	437.70	87.5	70 - 130
D 42 13C2_PFTeDA	846373	1087648			128.5	50 - 150
D 40 13C2_PFHxDA	768834	934133			121.5	50 - 150

Report Date: 06-Aug-2021 18:04:58 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.385	2.711	3.216	3.259	3.195	3.475	3.345	3.289	3.387	3.422	3.268	2.523-3.866	0.22377	1.597
1 4:2 FTS	0.522	1.262	1.976	1.843	1.831	1.961	1.853	1.902	1.849	1.875	1.687	0.384-3.277	0.48219	0.915
15 PFHxA	17.651	17.071	18.236	18.609	17.663	17.772	18.954	17.307	19.329	19.230	18.182	14.934-20.391	0.90966	8.831
22 PFPeS	4.651	3.393	2.479	3.153	3.018	3.067	2.819	2.977	3.002	2.970	3.152	1.316-4.719	0.56726	1.509
28 GenX	0.997	0.787	0.773	0.768	0.744	0.775	0.759	0.782	0.817	0.778	0.798	0.528-0.959	0.07198	0.372
13 PFHpA	3.408	3.519	4.020	3.461	3.312	3.880	3.835	3.775	3.628	3.741	3.657	2.576-4.047	0.24506	1.656
14 PFHxS	3.231	2.617	3.554	3.335	3.115	3.031	2.985	3.111	3.012	3.084	3.107	2.368-3.861	0.24887	1.557
29 ADONA	2.921	2.622	3.386	2.988	3.029	3.080	3.196	3.140	2.951	2.861	3.017	2.438-3.619	0.19676	1.514
2 6:2 FTS	1.357	1.903	1.287	1.619	1.859	1.923	1.857	1.885	1.900	1.898	1.748	1.095-2.622	0.25436	0.929
20 PFOA	3.365	2.607	2.979	3.061	2.922	2.919	2.952	2.847	2.789	2.815	2.925	2.356-3.487	0.18840	1.461
12 PFHpS	2.433	2.465	2.857	3.112	2.909	2.930	3.026	2.927	2.984	2.895	2.853	2.189-3.628	0.23973	1.454
18 PFOS	3.318	2.855	3.552	3.195	3.336	3.588	3.462	3.189	3.479	3.526	3.350	2.685-3.986	0.21688	1.668
17 PFNA	8.588	6.466	6.371	6.223	6.449	6.714	6.308	6.327	6.063	6.064	6.557	4.217-8.680	0.74392	3.224
19 PFOSA	59.934	39.783	21.362	31.375	30.764	26.376	31.760	28.842	31.933	31.524	33.365	-0.588-62.116	10.45078	15.382
16 PFNS	2.386	2.334	2.478	3.369	2.773	2.633	2.714	2.522	2.548	2.605	2.636	1.939-3.606	0.27784	1.386
3 8:2 FTS	6.221	2.579	2.059	2.413	1.841	1.914	1.772	1.845	1.947	1.888	2.447	-2.296-5.978	1.37918	0.920
10 PFDA	14.443	12.588	11.362	12.626	11.952	13.461	13.730	14.163	13.325	13.254	13.090	9.118-14.785	0.94460	5.976
6 N-MeFOSAA	1.713	1.110	1.399	1.648	1.209	1.345	1.289	1.313	1.229	1.351	1.360	0.647-1.770	0.18705	0.604
9 PFDS	2.412	2.721	2.874	2.028	2.842	2.691	2.748	2.907	2.678	2.637	2.653	2.033-3.650	0.26934	1.421
5 N-EtFOSAA	2.311	1.227	1.272	1.769	1.522	1.520	1.740	1.720	1.564	1.669	1.631	0.639-2.404	0.29422	0.761
25 PFUdA	18.788	13.560	15.786	14.905	13.054	14.403	13.520	13.975	13.121	13.749	14.486	7.430-18.677	1.87448	6.527
26 MeFOSA	1.347	0.935	1.267	1.077	1.256	0.958	1.049	1.050	0.969	1.061	1.096	0.806-1.705	0.14997	0.628
27 EtFOSA	0.850	1.287	1.000	1.023	1.026	1.061	1.015	1.009	1.012	0.990	1.027	0.702-1.349	0.10776	0.513
11 PFDoA	12.549	10.239	9.448	10.989	11.727	10.436	10.711	10.832	10.789	10.051	10.777	9.247-14.206	0.82652	5.863
4 10:2 FTS	4.537	4.967	3.002	4.893	3.388	3.337	3.238	3.503	3.028	3.384	3.727	0.982-5.793	0.80193	1.694
34 PFDOS	3.143	3.093	2.927	3.023	3.139	3.123	3.110	3.109	3.056	3.182	3.090	2.912-3.365	0.07550	1.569
24 PFTrDA	7.838	8.089	8.167	8.469	8.162	8.190	7.598	7.921	8.352	7.905	8.069	7.415-8.908	0.24888	4.081
23 PFTeDA	13.088	12.889	11.077	12.009	11.901	11.683	11.505	11.287	10.942	10.447	11.682	9.536-14.265	0.78821	5.950
35 PFHxDA	9.617	10.626	11.071	11.484	10.092	10.682	10.645	10.167	10.565	10.395	10.534	8.523-11.660	0.52299	5.046
36 PFODA	13.693	13.972	13.664	13.425	13.176	13.335	13.170	13.136	12.704	12.820	13.309	11.980-14.371	0.39860	6.588

Report Date: 06-Aug-2021 18:04:57 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	583	578	580	569	575	554	539	539	517	521	Avg:A Wt:C2	555		RSD=4.5	
	105	104.1	104.4	102.4	103.5	99.7	97.1	97	93	93.8	Org:N Dep:R				
8 PFBA	1.004053	1.019480	1.038355	0.976216	0.993377	0.975749	1.013451	0.999585	0.983627	0.990411	Avg:A Wt:C2	0.999430		RSD=2.0	
	100.5	102	103.9	97.7	99.4	97.6	101.4	100	98.4	99.1	Org:N Dep:R				
D 50 13C5_PFPeA	568	531	539	526	538	510	506	502	488	496	Avg:A Wt:C2	521		RSD=4.7	
	109.1	102	103.6	101.1	103.4	97.9	97.3	96.5	93.8	95.3	Org:N Dep:R				
21 PFPeA	1.118171	1.125688	1.129754	1.066718	1.008563	1.052344	1.119375	1.120591	1.074828	1.087357	Avg:A Wt:C2	1.090339		RSD=3.7	
	102.6	103.2	103.6	97.8	92.5	96.5	102.7	102.8	98.6	99.7	Org:N Dep:R				
D 44 13C3_PFBS	186	183	183	168	187	179	177	179	177	175	Avg:A Wt:C2	179		RSD=3.2	
	103.8	102	102.2	93.8	104.3	99.6	98.6	100	98.5	97.3	Org:N Dep:R				
7 PFBS	1.205215	1.132625	1.193934	1.256208	1.173938	1.198576	1.228894	1.161848	1.164879	1.206561	Avg:A Wt:C2	1.192268		RSD=3.0	
	101.1	95	100.1	105.4	98.5	100.5	103.1	97.4	97.7	101.2	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	1.528166	2.153468	2.357496	2.309037	2.148042	2.243890	2.184305	2.165477	2.318891	2.127728	Avg:A Wt:C2	2.153650		RSD=10.9	
	71	100	109.5	107.2	99.7	104.2	101.4	100.5	107.7	98.8	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	21.9154	19.6486	21.4224	19.2772	20.6338	19.9576	19.5858	19.4678	17.8280	20.0674	Avg:A Wt:C2	19.9804		RSD=5.8	
	109.7	98.3	107.2	96.5	103.3	99.9	98	97.4	89.2	100.4	Org:N Dep:R				
D 49 13C5_PFHxA	579	640	621	566	593	570	599	572	567	541	Avg:A Wt:C2	585		RSD=5.0	
	99	109.4	106.3	96.8	101.4	97.4	102.4	97.9	96.9	92.5	Org:N Dep:R				
15 PFHxA	1.091188	0.966005	1.038296	1.067496	1.078899	1.066743	1.013346	1.015191	1.030783	1.081176	Avg:A Wt:C2	1.044912		RSD=3.8	
	104.4	92.4	99.4	102.2	103.3	102.1	97	97.2	98.6	103.5	Org:N Dep:R				
22 PFPeS	0.947309	0.971129	0.813326	0.948041	0.881083	0.899984	0.869926	0.868336	0.863477	0.910901	Avg:A Wt:C2	0.897351		RSD=5.4	
	105.6	108.2	90.6	105.6	98.2	100.3	96.9	96.8	96.2	101.5	Org:N Dep:R				
28 GenX	0.878227	0.707619	0.690457	0.670290	0.647908	0.677389	0.663699	0.679883	0.705786	0.661720	Avg:A Wt:C2	0.698298		RSD=9.5	
	125.8	101.3	98.9	96	92.8	97	95	97.4	101.1	94.8	Org:N Dep:R				
D 66 13C3_GenX	227	227	217	216	221	217	217	207	198	206	Avg:A Wt:C2	215		RSD=4.3	
	105.4	105.3	100.9	100.4	102.8	100.7	100.7	96.3	91.9	95.6	Org:N Dep:R				
13 PFHpA	1.164429	1.043231	1.177880	1.038497	1.126253	1.177351	1.111663	1.103567	1.111430	1.116440	Avg:A Wt:C2	1.117074		RSD=4.4	
	104.2	93.4	105.4	93	100.8	105.4	99.5	98.8	99.5	99.9	Org:N Dep:R				
D 47 13C4_PFHpA	502	515	495	527	479	468	476	488	446	441	Avg:A Wt:C2	484		RSD=5.7	
	103.7	106.5	102.2	108.9	99	96.8	98.5	100.8	92.3	91.2	Org:N Dep:R				
D 45 13C3_PFHxS	141	149	138	136	140	136	127	120	133	123	Avg:A Wt:C2	134		RSD=6.6	
	105.3	110.7	102.9	101.3	103.9	101.6	94.4	89.5	99	91.3	Org:N Dep:R				
14 PFHxS	1.152434	1.094080	1.041669	1.169224	0.993804	1.023542	1.173895	1.168265	1.030747	1.105811	Avg:A Wt:C2	1.095347		RSD=6.3	
	105.2	99.9	95.1	106.7	90.7	93.4	107.2	106.7	94.1	101	Org:N Dep:R				
29 ADONA	6.355175	6.061988	6.743659	6.859141	6.525829	6.678302	7.213248	6.949509	5.992249	6.506007	Avg:A Wt:C2	6.588511		RSD=5.8	
	96.5	92	102.4	104.1	99	101.4	109.5	105.5	90.9	98.7	Org:N Dep:R				
2 6:2 FTS	2.651454	2.479325	2.205313	2.203108	2.297675	2.565345	2.432903	2.331638	2.494044	2.648860	Avg:A Wt:C2	2.430967		RSD=6.9	
	109.1	102	90.7	90.6	94.5	105.5	100.1	95.9	102.6	109	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	16.7172	18.5160	17.3440	17.1842	17.3988	15.9728	15.2556	15.7106	13.7414	13.5124	Avg:A Wt:C2	16.1353		RSD=10.1	
	103.6	114.8	107.5	106.5	107.8	99	94.5	97.4	85.2	83.7	Org:N Dep:R				
D 53 13C8_PFOA	514	503	505	477	487	448	445	435	421	425	Avg:A Wt:C2	466		RSD=7.6	
	110.3	108	108.3	102.3	104.5	96.1	95.5	93.3	90.4	91.2	Org:N Dep:R				
20 PFOA	1.116683	0.962854	0.977141	0.989201	0.983422	1.005103	1.032107	1.002842	0.936265	0.947620	Avg:A Wt:C2	0.995324		RSD=5.1	
	112.2	96.7	98.2	99.4	98.8	101	103.7	100.8	94.1	95.2	Org:N Dep:R				
12 PFHpS	0.967700	0.869401	1.004112	1.018131	0.968107	0.909187	0.996441	1.013303	0.865096	0.903733	Avg:A Wt:C2	0.951521		RSD=6.3	
	101.7	91.4	105.5	107	101.7	95.6	104.7	106.5	90.9	95	Org:N Dep:R				
D 54 13C8_PFOS	132	144	131	135	131	141	128	134	131	125	Avg:A Wt:C2	133		RSD=4.3	
	99.6	108.4	98.4	101.2	98.2	105.8	95.8	100.4	98.3	94	Org:N Dep:R				
18 PFOS	1.053986	1.248155	1.091214	1.087392	1.222981	1.082154	1.182121	1.130210	1.096348	1.140064	Avg:A Wt:C2	1.133462		RSD=5.7	
	93	110.1	96.3	95.9	107.9	95.5	104.3	99.7	96.7	100.6	Org:N Dep:R				
17 PFNA	1.236892	1.080477	1.074969	1.136775	1.095787	1.058805	1.154111	1.030137	1.074460	1.056308	Avg:A Wt:C2	1.099872		RSD=5.5	
	112.5	98.2	97.7	103.4	99.6	96.3	104.9	93.7	97.7	96	Org:N Dep:R				
D 56 13C9_PFNA	604	595	587	548	581	594	544	588	522	535	Avg:A Wt:C2	570		RSD=5.1	
	106.1	104.4	103.1	96.1	101.9	104.2	95.4	103.2	91.7	94	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.953224	3.686073	3.927216	3.767651	3.794270	3.586402	3.944701	3.883931	3.479161	3.902807	Avg:A Wt:C2	3.792544		RSD=4.3	
	104.2	97.2	103.6	99.3	100	94.6	104	102.4	91.7	102.9	Org:N Dep:R				
D 55 13C8_PFOSA	286	274	299	267	268	274	268	277	260	256	Avg:A Wt:C2	273		RSD=4.6	
	105	100.4	109.6	97.8	98.3	100.5	98.1	101.5	95.2	93.8	Org:N Dep:R				
19 PFOSA	1.272218	1.118180	1.056716	1.117246	1.197035	1.062007	1.098814	1.063340	1.075551	1.141871	Avg:A Wt:C2	1.120298		RSD=6.1	
	113.6	99.8	94.3	99.7	106.8	94.8	98.1	94.9	96	101.9	Org:N Dep:R				
16 PFNS	0.932193	0.679926	0.860624	0.851425	0.906502	0.741240	0.845303	0.789952	0.753499	0.823073	Avg:A Wt:C2	0.818374		RSD=9.5	
	113.9	83.1	105.2	104	110.8	90.6	103.3	96.5	92.1	100.6	Org:N Dep:R				
3 8:2 FTS	1.739227	2.613652	2.441764	2.442471	2.285084	2.291640	2.080875	2.132501	2.313332	2.055335	Avg:A Wt:C2	2.239588		RSD=11.1	
	77.7	116.7	109	109.1	102	102.3	92.9	95.2	103.3	91.8	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	21.8824	20.8836	19.6498	19.1428	19.4796	18.2004	18.4624	19.0376	16.4172	17.9062	Avg:A Wt:C2	19.1062		RSD=8.0	
	114.5	109.3	102.8	100.2	102	95.3	96.6	99.6	85.9	93.7	Org:N Dep:R				
10 PFDA	1.330662	1.237001	1.123763	1.063063	1.161375	1.166171	1.187292	1.165630	1.120399	1.065649	Avg:A Wt:C2	1.162101		RSD=6.8	
	114.5	106.4	96.7	91.5	99.9	100.4	102.2	100.3	96.4	91.7	Org:N Dep:R				
D 51 13C6_PFDA	575	578	571	604	543	544	542	517	493	491	Avg:A Wt:C2	546		RSD=6.8	
	105.4	106	104.7	110.6	99.5	99.6	99.4	94.7	90.3	89.9	Org:N Dep:R				
D 58 d3-MeFOSAA	133	134	121	135	119	113	125	117	123	130	Avg:A Wt:C2	125		RSD=6.1	
	106.1	107.4	97	107.9	95.3	90.7	99.5	93.8	98.1	104.1	Org:N Dep:R				
6 N-MeFOSAA	0.773117	0.776166	0.857448	0.849580	0.817421	0.909099	0.816861	0.860324	0.752251	0.776814	Avg:A Wt:C2	0.818908		RSD=6.1	
	94.4	94.8	104.7	103.7	99.8	111	99.8	105.1	91.9	94.9	Org:N Dep:R				
9 PFDS	0.757289	0.808987	0.951599	0.785042	0.857176	0.760160	0.889506	0.829502	0.793250	0.833182	Avg:A Wt:C2	0.826569		RSD=7.3	
	91.6	97.9	115.1	95	103.7	92	107.6	100.4	96	100.8	Org:N Dep:R				
D 60 d5-EtFOSAA	119	122	118	113	119	112	112	105	96.9860	96.6390	Avg:A Wt:C2	111		RSD=8.1	
	106.7	109.4	106	101.3	106.6	100.9	100.7	94.3	87.2	86.9	Org:N Dep:R				
D 52 13C7_PFUdA	612	637	604	612	632	576	634	583	511	525	Avg:A Wt:C2	593		RSD=7.5	
	103.3	107.6	101.9	103.2	106.6	97.2	107	98.3	86.2	88.6	Org:N Dep:R				
5 N-EtFOSAA	1.268099	0.944172	0.857714	1.106244	1.026992	1.045322	1.037782	1.055023	1.052635	1.096378	Avg:A Wt:C2	1.049036		RSD=10.1	
	120.9	90	81.8	105.5	97.9	99.6	98.9	100.6	100.3	104.5	Org:N Dep:R				
25 PFUdA	1.109129	0.923734	0.972122	0.956131	0.828666	0.990463	0.852849	0.953349	0.951635	0.928470	Avg:A Wt:C2	0.946655		RSD=8.1	
	117.2	97.6	102.7	101	87.5	104.6	90.1	100.7	100.5	98.1	Org:N Dep:R				
D 61 d7-MeFOSE	92.5590	94.3550	79.2300	82.8840	89.0850	80.5440	84.3840	80.8070	73.5870	76.0150	Avg:A Wt:C2	83.3450		RSD=8.2	
	111.1	113.2	95.1	99.4	106.9	96.6	101.2	97	88.3	91.2	Org:N Dep:R				
32 MeFOSE	1.008006	0.892587	1.401237	1.178177	0.958186	1.132064	1.159981	1.151054	1.164764	1.220194	Avg:A Wt:C2	1.126625		RSD=12.8	
	89.5	79.2	124.4	104.6	85	100.5	103	102.2	103.4	108.3	Org:N Dep:R				
D 57 d3-MeFOSA	53.3810	47.8490	48.2120	46.9290	50.5890	48.3420	49.4670	54.0320	50.4870	54.7650	Avg:A Wt:C2	50.4053		RSD=5.5	
	105.9	94.9	95.6	93.1	100.4	95.9	98.1	107.2	100.2	108.6	Org:N Dep:R				
26 MeFOSA	1.155842	0.958850	1.318863	1.081847	1.045306	1.096324	1.036926	0.969975	0.950398	0.974225	Avg:A Wt:C2	1.058856		RSD=10.7	
	109.2	90.6	124.6	102.2	98.7	103.5	97.9	91.6	89.8	92	Org:N Dep:R				
31 11Cl-PF3OUDS	3.140130	3.280394	3.744225	3.384047	3.180007	2.973551	3.614202	3.339559	3.126329	3.481807	Avg:A Wt:C2	3.326425		RSD=7.1	
	94.4	98.6	112.6	101.7	95.6	89.4	108.7	100.4	94	104.7	Org:N Dep:R				
D 62 d9-EtFOSE	95.5530	98.1780	95.6480	95.4970	90.5290	91.4170	96.5180	91.0680	88.3210	92.9310	Avg:A Wt:C2	93.5660		RSD=3.4	
	102.1	104.9	102.2	102.1	96.8	97.7	103.2	97.3	94.4	99.3	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	0.788463	1.028438	0.918995	0.921181	1.009411	1.005043	0.905800	1.031045	0.957527	0.986923	Avg:A Wt:C2	0.955283		RSD=7.8	
	82.5	107.7	96.2	96.4	105.7	105.2	94.8	107.9	100.2	103.3	Org:N Dep:R				
D 59 d5-EtFOSA	44.6190	44.7820	44.4530	45.1920	43.4420	42.9720	45.6340	46.6400	45.8460	38.6150	Avg:A Wt:C2	44.2195		RSD=5.1	
	100.9	101.3	100.5	102.2	98.2	97.2	103.2	105.5	103.7	87.3	Org:N Dep:R				
27 EtFOSA	1.154217	1.379795	1.087778	1.053417	1.120091	1.144734	1.080173	1.022796	1.012080	1.238848	Avg:A Wt:C2	1.129393		RSD=9.8	
	102.2	122.2	96.3	93.3	99.2	101.4	95.6	90.6	89.6	109.7	Org:N Dep:R				
D 38 13C2_PFDoA	598	607	604	596	596	596	604	571	524	536	Avg:A Wt:C2	583		RSD=5.1	
	102.6	104.1	103.5	102.2	102.1	102.2	103.6	97.9	89.9	91.9	Org:N Dep:R				
11 PFDoA	1.133242	0.994525	1.038141	1.035797	1.143065	1.034548	1.027268	1.038156	1.105773	1.032070	Avg:A Wt:C2	1.058259		RSD=4.7	
	107.1	94	98.1	97.9	108	97.8	97.1	98.1	104.5	97.5	Org:N Dep:R				
4 10:2 FTS	2.576959	2.531817	2.217775	3.249762	2.539895	2.700570	2.560469	2.379769	2.573520	2.481532	Avg:A Wt:C2	2.581207		RSD=10.4	
	99.8	98.1	85.9	125.9	98.4	104.6	99.2	92.2	99.7	96.1	Org:N Dep:R				
34 PFDOS	0.754003	0.690849	0.803456	0.713529	0.757448	0.676327	0.796981	0.741673	0.726735	0.824843	Avg:A Wt:C2	0.748584		RSD=6.5	
	100.7	92.3	107.3	95.3	101.2	90.3	106.5	99.1	97.1	110.2	Org:N Dep:R				
24 PFTrDA	1.061395	0.914742	0.965012	0.964646	0.935726	0.902761	0.889030	0.912387	0.955374	0.922175	Avg:A Wt:C2	0.942325		RSD=5.2	
	112.6	97.1	102.4	102.4	99.3	95.8	94.3	96.8	101.4	97.9	Org:N Dep:R				
D 42 13C2_PFTeDA	910	905	913	902	903	881	894	854	869	915	Avg:A Wt:C2	895		RSD=2.2	
	101.7	101.1	102	100.8	100.9	98.4	100	95.5	97.2	102.3	Org:N Dep:R				
23 PFTeDA	0.776447	0.845574	0.822542	0.807523	0.824770	0.816884	0.834380	0.838668	0.756248	0.716867	Avg:A Wt:C2	0.803990		RSD=5.2	
	96.6	105.2	102.3	100.4	102.6	101.6	103.8	104.3	94.1	89.2	Org:N Dep:R				
35 PFHxDA	0.829097	0.719539	0.700137	0.713023	0.682805	0.666796	0.669502	0.662127	0.644881	0.653555	Avg:A Wt:C2	0.694146		RSD=7.7	
	119.4	103.7	100.9	102.7	98.4	96.1	96.4	95.4	92.9	94.2	Org:N Dep:R				
D 40 13C2_PFHxDA	855	871	865	844	846	838	840	815	791	796	Avg:A Wt:C2	836		RSD=3.2	
	102.2	104.1	103.4	101	101.2	100.2	100.5	97.5	94.6	95.2	Org:N Dep:R				
36 PFODA	0.876692	0.849879	0.832612	0.842030	0.854820	0.849321	0.868999	0.899394	0.870938	0.895069	Avg:A Wt:C2	0.863976		RSD=2.6	
	101.5	98.4	96.4	97.5	98.9	98.3	100.6	104.1	100.8	103.6	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	680773	656265	644351	676478	599597	638773	653149	598439	573738	596061	3.31
* 39 13C2_PFHxA	604810	629952	629151	591024	618541	558455	596847	576353	566357	582971	0.91
* 41 13C2_PFOA	531307	523758	503548	507041	517799	470704	475387	469635	451035	449899	4.14
* 43 13C3_PFBA	531675	553692	543608	523676	536669	514302	509696	496075	467408	493921	1.84
* 48 13C4_PFOS	131459	137543	142111	135999	135966	141542	132480	133041	132929	130700	0.14

13C2_PFDA ((|596061 - 680773| / (596061 + 680773)) / 2) * 100 = 3.32
13C2_PFHxA ((|582971 - 604810| / (582971 + 604810)) / 2) * 100 = 0.92
13C2_PFOA ((|449899 - 531307| / (449899 + 531307)) / 2) * 100 = 4.15
13C3_PFBA ((|493921 - 531675| / (493921 + 531675)) / 2) * 100 = 1.84
13C4_PFOS ((|130700 - 131459| / (130700 + 131459)) / 2) * 100 = 0.14

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	583037	578040	579662	568958	574801	553883	539298	538949	516545	521110	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	29270	58930	120379	277713	570994	1080902	2732761	5387255	7621312	10322261	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	567820	531053	539405	526259	538043	509525	506458	502499	488249	496034	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	31746	59780	121879	280685	542650	1072391	2834581	5630957	7871752	10787319	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	186163	183013	183412	168263	187099	178632	176862	179385	176633	174515	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	9917	18324	38716	93427	194164	378536	960663	1842416	2728326	3722753	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	1564	3952	9434	20787	41397	83654	199789	393747	579190	797598	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	109577	98243	107112	96386	103169	99788	97929	97339	89140	100337	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	578782	639924	621499	566329	593317	569799	598753	572424	567003	541168	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	604810	629952	629151	591024	618541	558455	596847	576353	566357	582971	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	31578	61817	129060	302277	640129	1215658	3033720	5811197	8766855	11701956	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	8271	16671	27985	74815	154629	301597	721589	1461090	2145936	2982201	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	19924	32083	59984	144840	286949	587381	1439607	2820691	4189975	5449351	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1134331	1133484	1085948	1080428	1107213	1083907	1084533	1037197	989435	1029391	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	29210	53760	116494	273621	539535	1103128	2648376	5380903	7440515	9845240	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	501705	515322	494507	526956	479053	468479	476471	487592	446303	440921	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	141373	148622	138208	135982	139557	136474	126738	120218	132990	122588	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	7413	14797	26202	72342	126210	254230	676936	1278063	1871129	2467177	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	42317	84869	175594	439311	857903	1717105	4305847	7869996	11260326	15026001	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	2101	4352	7252	17945	37898	77690	175927	347266	487343	678625	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	83586	92580	86720	85921	86994	79864	76278	78553	68707	67562	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	513933	502911	504574	476730	486725	447692	444611	434718	421315	424838	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	28695	48423	98608	235791	478656	899953	2294431	4359533	5916935	8051702	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	531307	523758	503548	507041	517799	470704	475387	469635	451035	449899	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	6512	12301	26423	65901	128621	236249	601126	1159700	1642901	2109380	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	131459	137543	142111	135999	135966	141542	132480	133041	132929	130700	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	132461	144256	130949	134615	130612	140706	127507	133503	130718	124994	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	6478	16709	26521	67920	148235	282605	699381	1400226	1994908	2644821	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	37367	64290	126231	311244	636270	1257170	3137237	6053992	8417210	11311416	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	604208	595015	587138	547591	580651	593674	543663	587688	522260	535422	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	24402	49558	95859	236347	461878	940627	2343873	4832573	6357949	9093104	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	286429	273954	298997	266840	268160	274235	267652	277015	259856	255949	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	18220	30633	63191	149063	320997	582479	1470499	2945612	4192324	5845215	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	5927	9416	21638	55015	113664	200250	517354	1012425	1418340	1975281	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1823	5229	9193	22396	42643	79914	184022	388926	545750	705150	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	109412	104418	98249	95714	97398	91002	92312	95188	82086	89531	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	38261	71551	128400	320807	630572	1268223	3220144	6027587	8284110	10462370	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	575067	578423	571295	603552	542953	543755	542435	517110	492926	490892	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	680773	656265	644351	676478	599597	638773	653149	598439	573738	596061	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	663677	671506	606917	675181	596376	567408	622577	586416	613690	650996	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	5131	10424	20816	57362	97498	206332	508559	1009015	1384946	2022812	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	4835	11250	24025	50937	107927	206217	546676	1067543	1499388	2007873	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	593250	608417	589241	563411	592804	561157	559787	524300	484930	483195	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	612192	637413	603947	611772	631526	575835	633919	582568	511026	525183	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7523	11489	20216	62327	121761	234636	580937	1106297	1531363	2119058	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	33950	58880	117422	292467	523324	1140686	2703185	5553906	7294654	9752333	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	92559	94355	79230	82884	89085	80544	84384	80807	73587	76015	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	4665	8422	22204	48826	85360	182362	489419	930132	1285672	1855061	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	53381	47849	48212	46929	50589	48342	49467	54032	50487	54765	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	3085	4588	12717	25385	52881	105997	256468	524097	719741	1067069	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	19591	44577	92373	214561	391257	788259	2170538	4199824	5774472	8199262	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	95553	98178	95648	95497	90529	91417	96518	91068	88321	92931	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	3767	10097	17580	43985	91381	183756	437130	938952	1268546	1834314	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	44619	44782	44453	45192	43442	42972	45634	46640	45846	38615	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2575	6179	9671	23803	48659	98383	246463	477032	695997	956762	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	598213	607275	603858	595993	595792	595946	604365	571044	524494	535827	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	33896	60395	125378	308664	681029	1233069	3104224	5928328	8699570	11060221	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	2718	5097	8402	29985	47695	94764	227853	436741	610935	856703	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	4834	9647	20369	46489	95766	184236	491844	958471	1379361	1996024	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	31747	55550	116546	287461	557498	1075994	2686493	5210130	7516321	9882522	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	909914	904534	912519	901768	902749	880637	894200	854370	869439	915148	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	35325	76485	150117	364099	744560	1438756	3730513	7165326	9862676	13120795	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	35432	62652	121064	300946	577451	1117260	2813373	5396284	7654353	10407257	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	854713	870724	864574	844141	845704	837783	840438	814992	791293	796204	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	37466	74001	143971	355396	722925	1423094	3651699	7329992	10337513	14253151	

Report Date: 06-Aug-2021 18:04:57 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.705	1.704	1.704	1.705	1.710	1.704	1.704	1.699	1.704	1.704	1.704	0.169
8 PFBA	1.705	1.711	1.711	1.705	1.710	1.711	1.704	1.705	1.704	1.704	1.707	0.175
D 50 13C5_PFPeA	2.078	2.076	2.076	2.078	2.066	2.076	2.076	2.067	2.076	2.066	2.073	0.256
21 PFPeA	2.078	2.076	2.076	2.078	2.066	2.076	2.076	2.067	2.066	2.076	2.073	0.256
D 44 13C3_PFBS	2.131	2.129	2.129	2.131	2.119	2.129	2.129	2.120	2.129	2.129	2.127	0.214
7 PFBS	2.131	2.129	2.129	2.131	2.119	2.129	2.129	2.130	2.129	2.129	2.128	0.170
1 4:2 FTS	2.398	2.397	2.397	2.398	2.388	2.397	2.397	2.389	2.397	2.397	2.395	0.155
D 63 13C2_4:2 FTS_2	2.398	2.397	2.397	2.398	2.388	2.397	2.397	2.389	2.388	2.388	2.393	0.202
D 49 13C5_PFHxA	2.434	2.433	2.433	2.434	2.423	2.433	2.433	2.434	2.432	2.433	2.431	0.123
* 39 13C2_PFHxA	2.434	2.433	2.433	2.434	2.423	2.433	2.433	2.434	2.432	2.433	2.431	0.123
15 PFHxA	2.434	2.441	2.442	2.434	2.423	2.433	2.433	2.434	2.432	2.433	2.433	0.208
22 PFPeS	2.470	2.468	2.468	2.470	2.450	2.468	2.468	2.460	2.459	2.468	2.465	0.257
28 GenX	2.550	2.548	2.549	2.550	2.539	2.548	2.548	2.541	2.548	2.548	2.547	0.146
D 66 13C3_GenX	2.550	2.548	2.549	2.550	2.539	2.548	2.548	2.550	2.548	2.548	2.547	0.117
13 PFHpA	2.800	2.808	2.808	2.809	2.790	2.799	2.799	2.800	2.799	2.799	2.801	0.219
D 47 13C4_PFHpA	2.809	2.808	2.808	2.809	2.790	2.799	2.799	2.800	2.799	2.799	2.802	0.237
D 45 13C3_PFHxS	2.818	2.817	2.817	2.819	2.808	2.817	2.817	2.818	2.817	2.817	2.816	0.117
14 PFHxS	2.828	2.826	2.826	2.819	2.808	2.817	2.817	2.818	2.817	2.817	2.819	0.214
29 ADONA	2.846	2.845	2.845	2.846	2.826	2.844	2.844	2.836	2.844	2.844	2.842	0.214
2 6:2 FTS	3.160	3.152	3.158	3.160	3.145	3.158	3.158	3.153	3.158	3.158	3.156	0.159
D 64 13C2_6:2 FTS_2	3.160	3.158	3.165	3.154	3.145	3.158	3.158	3.153	3.158	3.158	3.156	0.175
D 53 13C8_PFOA	3.187	3.185	3.185	3.180	3.165	3.178	3.178	3.180	3.178	3.178	3.179	0.198
20 PFOA	3.187	3.185	3.185	3.180	3.171	3.185	3.185	3.180	3.178	3.185	3.182	0.148
* 41 13C2_PFOA	3.187	3.185	3.185	3.187	3.171	3.178	3.178	3.180	3.178	3.178	3.180	0.156
12 PFHpS	3.187	3.185	3.192	3.187	3.171	3.185	3.185	3.187	3.185	3.185	3.184	0.159
* 48 13C4_PFOS	3.560	3.566	3.558	3.560	3.534	3.550	3.558	3.552	3.550	3.558	3.554	0.245
D 54 13C8_PFOS	3.560	3.558	3.558	3.552	3.542	3.550	3.558	3.552	3.558	3.550	3.554	0.156
18 PFOS	3.552	3.550	3.558	3.560	3.542	3.558	3.558	3.560	3.550	3.558	3.554	0.162
17 PFNA	3.568	3.566	3.566	3.560	3.550	3.558	3.558	3.560	3.558	3.558	3.560	0.145
D 56 13C9_PFNA	3.568	3.558	3.566	3.560	3.550	3.558	3.558	3.560	3.558	3.558	3.559	0.132
30 9Cl-PF3ONS	3.766	3.765	3.765	3.766	3.751	3.765	3.758	3.766	3.765	3.765	3.763	0.136
D 55 13C8_PFOSA	3.844	3.843	3.843	3.845	3.827	3.843	3.843	3.844	3.843	3.843	3.842	0.143
19 PFOSA	3.853	3.843	3.843	3.845	3.835	3.843	3.843	3.844	3.843	3.843	3.843	0.111

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.902	3.901	3.901	3.902	3.884	3.901	3.901	3.902	3.901	3.901	3.899	0.133
3 8:2 FTS	3.894	3.909	3.901	3.910	3.892	3.901	3.901	3.902	3.901	3.901	3.901	0.146
D 65 13C2_8:2 FTS_2	3.910	3.909	3.901	3.902	3.892	3.901	3.901	3.910	3.901	3.901	3.902	0.144
10 PFDA	3.918	3.909	3.909	3.910	3.901	3.909	3.909	3.910	3.909	3.909	3.909	0.110
D 51 13C6_PFDA	3.910	3.909	3.909	3.910	3.901	3.909	3.909	3.910	3.909	3.909	3.908	0.074
* 37 13C2_PFDA	3.910	3.909	3.917	3.910	3.901	3.909	3.909	3.910	3.909	3.909	3.909	0.104
D 58 d3-MeFOSAA	4.069	4.076	4.067	4.068	4.057	4.067	4.067	4.069	4.066	4.067	4.067	0.109
6 N-MeFOSAA	4.078	4.076	4.076	4.068	4.057	4.075	4.075	4.069	4.075	4.067	4.071	0.156
9 PFDS	4.204	4.211	4.211	4.203	4.191	4.201	4.201	4.204	4.201	4.201	4.202	0.128
D 60 d5-EtFOSAA	4.225	4.232	4.232	4.234	4.211	4.221	4.221	4.225	4.231	4.232	4.226	0.170
D 52 13C7_PFUdA	4.225	4.232	4.221	4.224	4.211	4.221	4.221	4.225	4.221	4.221	4.222	0.122
5 N-EtFOSAA	4.235	4.232	4.232	4.234	4.221	4.231	4.231	4.235	4.231	4.232	4.231	0.096
25 PFUdA	4.235	4.232	4.232	4.224	4.221	4.221	4.221	4.225	4.221	4.221	4.225	0.131
D 61 d7-MeFOSE	4.275	4.272	4.272	4.274	4.262	4.272	4.272	4.275	4.272	4.272	4.271	0.093
32 MeFOSE	4.296	4.292	4.282	4.284	4.272	4.282	4.282	4.286	4.282	4.282	4.284	0.151
D 57 d3-MeFOSA	4.296	4.292	4.292	4.295	4.282	4.292	4.292	4.296	4.292	4.292	4.292	0.093
26 MeFOSA	4.306	4.302	4.302	4.295	4.292	4.302	4.302	4.296	4.302	4.302	4.300	0.107
31 11Cl-PF3OUDS	4.365	4.370	4.370	4.372	4.361	4.370	4.370	4.373	4.361	4.370	4.367	0.104
D 62 d9-EtFOSE	4.444	4.441	4.441	4.443	4.432	4.441	4.441	4.444	4.441	4.441	4.440	0.071
33 EtFOSE	4.453	4.450	4.459	4.461	4.450	4.450	4.459	4.452	4.450	4.459	4.454	0.096
D 59 d5-EtFOSA	4.462	4.459	4.459	4.461	4.459	4.459	4.459	4.461	4.459	4.468	4.460	0.058
27 EtFOSA	4.471	4.468	4.468	4.470	4.459	4.468	4.468	4.470	4.468	4.468	4.467	0.070
D 38 13C2_PFDoA	4.507	4.504	4.503	4.506	4.495	4.495	4.504	4.497	4.495	4.503	4.501	0.102
11 PFDoA	4.507	4.504	4.503	4.506	4.495	4.504	4.504	4.497	4.495	4.503	4.502	0.094
4 10:2 FTS	4.507	4.513	4.512	4.506	4.504	4.513	4.513	4.515	4.504	4.512	4.510	0.100
34 PFDOS	4.720	4.712	4.718	4.719	4.711	4.718	4.718	4.720	4.718	4.718	4.717	0.068
24 PFTrDA	4.747	4.746	4.745	4.746	4.738	4.738	4.745	4.747	4.738	4.745	4.743	0.078
D 42 13C2_PFTeDA	4.965	4.964	4.964	4.965	4.956	4.964	4.964	4.965	4.964	4.971	4.964	0.073
23 PFTeDA	4.965	4.964	4.964	4.965	4.956	4.964	4.971	4.965	4.964	4.971	4.965	0.085
35 PFHxDA	5.370	5.360	5.360	5.361	5.351	5.360	5.360	5.361	5.360	5.360	5.360	0.080
D 40 13C2_PFHxDA	5.361	5.360	5.360	5.361	5.351	5.360	5.360	5.361	5.360	5.360	5.359	0.053
36 PFODA	5.746	5.745	5.744	5.738	5.737	5.737	5.737	5.738	5.737	5.744	5.740	0.063

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521017.d
Injection Date: 05-Aug-2021 15:00:44 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC-1590 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	508.95	101.8	70 - 130
D 46 13C4_PFBA	574801	584519			101.7	50 - 150
D 50 13C5_PFPeA	538043	540558			100.5	50 - 150
21 PFPeA			500.00	505.52	101.1	70 - 130
7 PFBS			442.50	445.92	100.8	70 - 130
D 44 13C3_PFBS	187099	194897			104.2	50 - 150
1 4:2 FTS			467.50	478.92	102.4	70 - 130
D 63 13C2_4:2 FTS_2	103169	103808			100.6	50 - 150
D 49 13C5_PFHxA	593317	613342			103.4	50 - 150
15 PFHxA			500.00	507.37	101.5	70 - 130
22 PFPeS			470.00	456.95	97.2	70 - 130
28 GenX			2500.00	2543.58	101.7	70 - 130
D 66 13C3_GenX	1107213	1104532			99.8	50 - 150
D 47 13C4_PFHpA	479053	501669			104.7	50 - 150
13 PFHpA			500.00	496.57	99.3	70 - 130
D 45 13C3_PFHxS	139557	143853			103.1	50 - 150
14 PFHxS			456.00	437.87	96	70 - 130
29 ADONA			2355.00	2337.45	99.3	70 - 130
D 64 13C2_6:2 FTS_2	86994	83231			95.7	50 - 150
2 6:2 FTS			475.00	471.45	99.3	70 - 130
D 53 13C8_PFOA	486725	471107			96.8	50 - 150
20 PFOA			500.00	548.79	109.8	70 - 130
12 PFHpS			475.00	463.32	97.5	70 - 130
18 PFOS			462.75	485.70	105	70 - 130
D 54 13C8_PFOS	130612	135578			103.8	50 - 150
17 PFNA			500.00	510.05	102	70 - 130
D 56 13C9_PFNA	580651	607340			104.6	50 - 150
30 9Cl-PF3ONS			2330.00	2269.04	97.4	70 - 130
D 55 13C8_PFOSA	268160	282766			105.4	50 - 150
19 PFOSA			500.00	474.64	94.9	70 - 130
16 PFNS			480.00	508.95	106	70 - 130
D 65 13C2_8:2 FTS_2	97398	95446			98	50 - 150
3 8:2 FTS			480.00	515.63	107.4	70 - 130
10 PFDA			500.00	495.47	99.1	70 - 130
D 51 13C6_PFDA	542953	542834			100	50 - 150
6 N-MeFOSAA			500.00	609.36	121.9	70 - 130

Report Date: 06-Aug-2021 18:04:17 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521017.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	671124			112.5	50 - 150
9 PFDS			482.50	530.30	109.9	70 - 130
D 60 d5-EtFOSAA	592804	626242			105.6	50 - 150
D 52 13C7_PFUdA	631526	651171			103.1	50 - 150
5 N-EtFOSAA			500.00	548.52	109.7	70 - 130
25 PFUdA			500.00	492.70	98.5	70 - 130
D 61 d7-MeFOSE	89085	84985			95.4	50 - 150
D 57 d3-MeFOSA	50589	45816			90.6	50 - 150
31 11Cl-PF3OUDS			2355.00	2329.77	98.9	70 - 130
D 62 d9-EtFOSE	90529	99587			110	50 - 150
D 59 d5-EtFOSA	43442	49688			114.4	50 - 150
11 PFDoA			500.00	539.25	107.8	70 - 130
D 38 13C2_PFDoA	595792	611700			102.7	50 - 150
4 10:2 FTS			2410.00	2521.55	104.6	70 - 130
24 PFTrDA			500.00	528.71	105.7	70 - 130
23 PFTeDA			500.00	549.35	109.9	70 - 130
D 42 13C2_PFTeDA	902749	914773			101.3	50 - 150
D 40 13C2_PFHxDA	845704	919211			108.7	50 - 150

Report Date: 03-Aug-2021 19:53:30 AIM Revision: 2.0 19-Apr-2021 11:30:40

NO SAMPLES AFFECTED

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121005.d
Injection Date: 31-Jul-2021 12:43:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	630797			112	50 - 150
8 PFBA			100.00	105.43	105.4	70 - 130
D 50 13C5_PFPeA	523546	580611			110.9	50 - 150
21 PFPeA			100.00	101.93	101.9	70 - 130
7 PFBS			88.400	93.544	105.8	70 - 130
D 44 13C3_PFBS	169277	180931			106.9	50 - 150
D 63 13C2_4:2 FTS_2	90196	109162			121	50 - 150
1 4:2 FTS			93.400	100.26	107.3	70 - 130
D 49 13C5_PFHxA	600114	669846			111.6	50 - 150
15 PFHxA			100.00	96.354	96.4	70 - 130
22 PFPeS			93.800	90.054	96	70 - 130
28 GenX			200.00	203.51	101.8	70 - 130
D 66 13C3_GenX	1000599	1263013			126.2	50 - 150
D 47 13C4_PFHpA	482787	541026			112.1	50 - 150
13 PFHpA			100.00	87.538	87.5	70 - 130
D 45 13C3_PFHxS	137682	147645			107.2	50 - 150
14 PFHxS			91.000	89.117	97.9	70 - 130
29 ADONA			94.200	101.70	108	70 - 130
D 64 13C2_6:2 FTS_2	77321	93519			120.9	50 - 150
2 6:2 FTS			94.800	149.89	158.1	70 - 130
20 PFOA			100.00	105.94	105.9	70 - 130
D 53 13C8_PFOA	538966	508929			94.4	50 - 150
12 PFHpS			95.200	93.607	98.3	70 - 130
18 PFOS			92.800	87.659	94.5	70 - 130
D 54 13C8_PFOS	139992	147774			105.6	50 - 150
17 PFNA			100.00	112.18	112.2	70 - 130
D 56 13C9_PFNA	618881	632796			102.2	50 - 150
30 9Cl-PF3ONS			93.200	98.786	106	70 - 130
D 55 13C8_PFOSA	250019	286703			114.7	50 - 150
19 PFOSA			100.00	97.563	97.6	70 - 130
16 PFNS			96.000	105.17	109.5	70 - 130
D 65 13C2_8:2 FTS_2	72182	108532			150.4	50 - 150
10 PFDA			100.00	105.97	106	70 - 130
3 8:2 FTS			95.800	92.775	96.8	70 - 130
D 51 13C6_PFDA	590501	617850			104.6	50 - 150
D 58 d3-MeFOSAA	601725	638732			106.2	50 - 150

Report Date: 03-Aug-2021 19:53:30 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	85.626	85.6	70 - 130
9 PFDS			96.400	86.604	89.8	70 - 130
D 52 13C7_PFUdA	707587	671685			94.9	50 - 150
25 PFUdA			100.00	110.97	111	70 - 130
D 60 d5-EtFOSAA	521292	592168			113.6	50 - 150
5 N-EtFOSAA			100.00	76.888	76.9	70 - 130
D 61 d7-MeFOSE	68295	90941			133.2	50 - 150
32 MeFOSE			100.00	98.929	98.9	70 - 130
D 57 d3-MeFOSA	40777	54238			133	50 - 150
26 MeFOSA			100.00	97.800	97.8	70 - 130
31 11Cl-PF3OUDS			94.200	91.365	97	70 - 130
D 62 d9-EtFOSE	68452	95057			138.9	50 - 150
33 EtFOSE			100.00	105.77	105.8	70 - 130
D 59 d5-EtFOSA	38025	51944			136.6	50 - 150
27 EtFOSA			100.00	75.489	75.5	70 - 130
11 PFDoA			100.00	106.68	106.7	70 - 130
D 38 13C2_PFDoA	745164	650962			87.4	50 - 150
4 10:2 FTS			96.400	53.883	55.9	70 - 130
34 PFDOS			96.800	96.142	99.3	70 - 130
24 PFTrDA			100.00	109.95	109.9	70 - 130
23 PFTeDA			100.00	102.52	102.5	70 - 130
D 42 13C2_PFTeDA	846373	953398			112.6	50 - 150
D 40 13C2_PFHxDA	768834	904421			117.6	50 - 150
35 PFHxDA			100.00	121.31	121.3	70 - 130
36 PFODA			100.00	107.65	107.7	70 - 130

NO SAMPLES AFFECTED

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121006.d
Injection Date: 31-Jul-2021 12:54:21 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	619099			98.1	50 - 150
8 PFBA			200.00	205.22	102.6	70 - 130
D 50 13C5_PFPeA	580611	618368			106.5	50 - 150
21 PFPeA			200.00	200.63	100.3	70 - 130
7 PFBS			176.80	185.02	104.7	70 - 130
D 44 13C3_PFBS	180931	183664			101.5	50 - 150
D 63 13C2_4:2 FTS_2	109162	113013			103.5	50 - 150
1 4:2 FTS			186.80	205.73	110.1	70 - 130
D 49 13C5_PFHxA	669846	637596			95.2	50 - 150
15 PFHxA			200.00	213.37	106.7	70 - 130
22 PFPeS			187.60	173.52	92.5	70 - 130
28 GenX			400.00	400.98	100.2	70 - 130
D 66 13C3_GenX	1263013	1201115			95.1	50 - 150
D 47 13C4_PFHpA	541026	551602			102	50 - 150
13 PFHpA			200.00	200.43	100.2	70 - 130
D 45 13C3_PFHxS	147645	151769			102.8	50 - 150
14 PFHxS			182.00	187.67	103.1	70 - 130
29 ADONA			188.40	192.00	101.9	70 - 130
D 64 13C2_6:2 FTS_2	93519	94950			101.5	50 - 150
2 6:2 FTS			189.60	204.83	108	70 - 130
20 PFOA			200.00	220.04	110	70 - 130
D 53 13C8_PFOA	508929	518622			101.9	50 - 150
12 PFHpS			190.40	184.80	97.1	70 - 130
18 PFOS			185.60	190.07	102.4	70 - 130
D 54 13C8_PFOS	147774	148532			100.5	50 - 150
17 PFNA			200.00	202.95	101.5	70 - 130
D 56 13C9_PFNA	632796	685491			108.3	50 - 150
30 9Cl-PF3ONS			186.40	172.17	92.4	70 - 130
D 55 13C8_PFOSA	286703	311015			108.5	50 - 150
19 PFOSA			200.00	188.73	94.4	70 - 130
16 PFNS			192.00	228.92	119.2	70 - 130
D 65 13C2_8:2 FTS_2	108532	106801			98.4	50 - 150
10 PFDA			200.00	204.16	102.1	70 - 130
3 8:2 FTS			191.60	168.90	88.1	70 - 130
D 51 13C6_PFDA	617850	613585			99.3	50 - 150
D 58 d3-MeFOSAA	638732	634434			99.3	50 - 150

Report Date: 03-Aug-2021 19:53:31 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	216.47	108.2	70 - 130
9 PFDS			192.80	193.32	100.3	70 - 130
D 52 13C7_PFUdA	671685	676160			100.7	50 - 150
25 PFUdA			200.00	217.55	108.8	70 - 130
D 60 d5-EtFOSAA	592168	647982			109.4	50 - 150
5 N-EtFOSAA			200.00	165.56	82.8	70 - 130
D 61 d7-MeFOSE	90941	85494			94	50 - 150
32 MeFOSE			200.00	202.87	101.4	70 - 130
D 57 d3-MeFOSA	54238	49825			91.9	50 - 150
26 MeFOSA			200.00	261.95	131	70 - 130
31 11Cl-PF3OUDS			188.40	186.11	98.8	70 - 130
D 62 d9-EtFOSE	95057	98725			103.9	50 - 150
33 EtFOSE			200.00	171.63	85.8	70 - 130
D 59 d5-EtFOSA	51944	48708			93.8	50 - 150
27 EtFOSA			200.00	210.35	105.2	70 - 130
11 PFDoA			200.00	195.63	97.8	70 - 130
D 38 13C2_PFDoA	650962	701514			107.8	50 - 150
4 10:2 FTS			192.80	110.61	57.4	70 - 130
34 PFDOS			193.60	201.90	104.3	70 - 130
24 PFTrDA			200.00	212.32	106.2	70 - 130
23 PFTeDA			200.00	200.05	100	70 - 130
D 42 13C2_PFTeDA	953398	949684			99.6	50 - 150
D 40 13C2_PFHxDA	904421	927933			102.6	50 - 150
35 PFHxDA			200.00	214.64	107.3	70 - 130
36 PFODA			200.00	207.85	103.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121022.d
Injection Date: 31-Jul-2021 15:44:21 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 15
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	630973			100	50 - 150
8 PFBA			1000.00	936.95	93.7	70 - 130
D 50 13C5_PFPeA	580611	592809			102.1	50 - 150
21 PFPeA			1000.00	916.31	91.6	70 - 130
7 PFBS			884.00	816.31	92.3	70 - 130
D 44 13C3_PFBS	180931	175276			96.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	100278			91.9	50 - 150
1 4:2 FTS			934.00	937.36	100.4	70 - 130
D 49 13C5_PFHxA	669846	649347			96.9	50 - 150
15 PFHxA			1000.00	919.28	91.9	70 - 130
22 PFPeS			938.00	888.80	94.8	70 - 130
28 GenX			2000.00	2016.60	100.8	70 - 130
D 66 13C3_GenX	1263013	1083830			85.8	50 - 150
D 47 13C4_PFHpA	541026	572100			105.7	50 - 150
13 PFHpA			1000.00	872.65	87.3	70 - 130
D 45 13C3_PFHxS	147645	150185			101.7	50 - 150
14 PFHxS			910.00	885.58	97.3	70 - 130
29 ADONA			942.00	906.93	96.3	70 - 130
D 64 13C2_6:2 FTS_2	93519	88211			94.3	50 - 150
2 6:2 FTS			948.00	964.75	101.8	70 - 130
20 PFOA			1000.00	953.99	95.4	70 - 130
D 53 13C8_PFOA	508929	520145			102.2	50 - 150
12 PFHpS			952.00	856.88	90	70 - 130
18 PFOS			928.00	805.03	86.7	70 - 130
D 54 13C8_PFOS	147774	162770			110.1	50 - 150
17 PFNA			1000.00	888.34	88.8	70 - 130
D 56 13C9_PFNA	632796	671445			106.1	50 - 150
30 9Cl-PF3ONS			932.00	784.93	84.2	70 - 130
D 55 13C8_PFOSA	286703	282327			98.5	50 - 150
19 PFOSA			1000.00	988.67	98.9	70 - 130
16 PFNS			960.00	830.65	86.5	70 - 130
D 65 13C2_8:2 FTS_2	108532	100566			92.7	50 - 150
10 PFDA			1000.00	972.27	97.2	70 - 130
3 8:2 FTS			958.00	923.73	96.4	70 - 130
D 51 13C6_PFDA	617850	591496			95.7	50 - 150
D 58 d3-MeFOSAA	638732	594065			93	50 - 150

Report Date: 03-Aug-2021 19:53:39 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121022.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1031.61	103.2	70 - 130
9 PFDS			964.00	832.38	86.3	70 - 130
D 52 13C7_PFUdA	671685	650908			96.9	50 - 150
25 PFUdA			1000.00	935.26	93.5	70 - 130
D 60 d5-EtFOSAA	592168	571978			96.6	50 - 150
5 N-EtFOSAA			1000.00	910.60	91.1	70 - 130
D 61 d7-MeFOSE	90941	87272			96	50 - 150
32 MeFOSE			1000.00	913.52	91.4	70 - 130
D 57 d3-MeFOSA	54238	46582			85.9	50 - 150
26 MeFOSA			1000.00	1247.55	124.8	70 - 130
31 11Cl-PF3OUDS			942.00	776.58	82.4	70 - 130
D 62 d9-EtFOSE	95057	96999			102	50 - 150
33 EtFOSE			1000.00	888.15	88.8	70 - 130
D 59 d5-EtFOSA	51944	45661			87.9	50 - 150
27 EtFOSA			1000.00	1028.63	102.9	70 - 130
11 PFDoA			1000.00	939.83	94	70 - 130
D 38 13C2_PFDoA	650962	656771			100.9	50 - 150
4 10:2 FTS			964.00	620.37	64.4	70 - 130
34 PFDOS			968.00	858.94	88.7	70 - 130
24 PFTrDA			1000.00	1081.08	108.1	70 - 130
23 PFTeDA			1000.00	954.48	95.4	70 - 130
D 42 13C2_PFTeDA	953398	963862			101.1	50 - 150
D 40 13C2_PFHxDA	904421	840486			92.9	50 - 150
35 PFHxDA			1000.00	1061.54	106.2	70 - 130
36 PFODA			1000.00	1031.99	103.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121038.d
Injection Date: 31-Jul-2021 18:34:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	661563			104.9	50 - 150
8 PFBA			1000.00	912.07	91.2	70 - 130
D 50 13C5_PFPeA	580611	625866			107.8	50 - 150
21 PFPeA			1000.00	882.34	88.2	70 - 130
7 PFBS			884.00	837.32	94.7	70 - 130
D 44 13C3_PFBS	180931	186339			103	50 - 150
D 63 13C2_4:2 FTS_2	109162	102087			93.5	50 - 150
1 4:2 FTS			934.00	983.44	105.3	70 - 130
D 49 13C5_PFHxA	669846	710604			106.1	50 - 150
15 PFHxA			1000.00	860.82	86.1	70 - 130
22 PFPeS			938.00	900.57	96	70 - 130
28 GenX			2000.00	1996.46	99.8	70 - 130
D 66 13C3_GenX	1263013	1108881			87.8	50 - 150
D 47 13C4_PFHpA	541026	562782			104	50 - 150
13 PFHpA			1000.00	922.12	92.2	70 - 130
D 45 13C3_PFHxS	147645	161712			109.5	50 - 150
14 PFHxS			910.00	819.06	90	70 - 130
29 ADONA			942.00	886.02	94.1	70 - 130
D 64 13C2_6:2 FTS_2	93519	84286			90.1	50 - 150
2 6:2 FTS			948.00	1013.53	106.9	70 - 130
20 PFOA			1000.00	927.95	92.8	70 - 130
D 53 13C8_PFOA	508929	546469			107.4	50 - 150
12 PFHpS			952.00	880.02	92.4	70 - 130
18 PFOS			928.00	867.63	93.5	70 - 130
D 54 13C8_PFOS	147774	157144			106.3	50 - 150
17 PFNA			1000.00	921.91	92.2	70 - 130
D 56 13C9_PFNA	632796	688784			108.8	50 - 150
30 9Cl-PF3ONS			932.00	908.05	97.4	70 - 130
D 55 13C8_PFOSA	286703	286613			100	50 - 150
19 PFOSA			1000.00	1008.82	100.9	70 - 130
16 PFNS			960.00	874.86	91.1	70 - 130
D 65 13C2_8:2 FTS_2	108532	112533			103.7	50 - 150
10 PFDA			1000.00	948.99	94.9	70 - 130
3 8:2 FTS			958.00	759.96	79.3	70 - 130
D 51 13C6_PFDA	617850	680491			110.1	50 - 150
D 58 d3-MeFOSAA	638732	643641			100.8	50 - 150

Report Date: 03-Aug-2021 19:53:49 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121038.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1083.23	108.3	70 - 130
9 PFDS			964.00	901.61	93.5	70 - 130
D 52 13C7_PFUdA	671685	709590			105.6	50 - 150
25 PFUdA			1000.00	994.30	99.4	70 - 130
D 60 d5-EtFOSAA	592168	605884			102.3	50 - 150
5 N-EtFOSAA			1000.00	968.89	96.9	70 - 130
D 61 d7-MeFOSE	90941	89425			98.3	50 - 150
32 MeFOSE			1000.00	963.18	96.3	70 - 130
D 57 d3-MeFOSA	54238	54577			100.6	50 - 150
26 MeFOSA			1000.00	1186.25	118.6	70 - 130
31 11Cl-PF3OUDS			942.00	863.86	91.7	70 - 130
D 62 d9-EtFOSE	95057	104249			109.7	50 - 150
33 EtFOSE			1000.00	899.77	90	70 - 130
D 59 d5-EtFOSA	51944	49490			95.3	50 - 150
27 EtFOSA			1000.00	997.76	99.8	70 - 130
11 PFDoA			1000.00	949.68	95	70 - 130
D 38 13C2_PFDoA	650962	684192			105.1	50 - 150
4 10:2 FTS			964.00	576.79	59.8	70 - 130
34 PFDOS			968.00	948.96	98	70 - 130
24 PFTrDA			1000.00	1071.77	107.2	70 - 130
23 PFTeDA			1000.00	895.99	89.6	70 - 130
D 42 13C2_PFTeDA	953398	1069874			112.2	50 - 150
D 40 13C2_PFHxDA	904421	877595			97	50 - 150
35 PFHxDA			1000.00	1052.77	105.3	70 - 130
36 PFODA			1000.00	1029.79	103	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121052.d
Injection Date: 31-Jul-2021 21:03:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 45
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	623063			98.8	50 - 150
8 PFBA			1000.00	938.76	93.9	70 - 130
D 50 13C5_PFPeA	580611	601785			103.6	50 - 150
21 PFPeA			1000.00	883.31	88.3	70 - 130
7 PFBS			884.00	818.38	92.6	70 - 130
D 44 13C3_PFBS	180931	177055			97.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	98533			90.3	50 - 150
1 4:2 FTS			934.00	898.37	96.2	70 - 130
D 49 13C5_PFHxA	669846	656607			98	50 - 150
15 PFHxA			1000.00	953.73	95.4	70 - 130
22 PFPeS			938.00	874.58	93.2	70 - 130
28 GenX			2000.00	1872.71	93.6	70 - 130
D 66 13C3_GenX	1263013	1120587			88.7	50 - 150
D 47 13C4_PFHpA	541026	554336			102.5	50 - 150
13 PFHpA			1000.00	857.30	85.7	70 - 130
D 45 13C3_PFHxS	147645	151993			102.9	50 - 150
14 PFHxS			910.00	824.27	90.6	70 - 130
29 ADONA			942.00	882.86	93.7	70 - 130
D 64 13C2_6:2 FTS_2	93519	85319			91.2	50 - 150
2 6:2 FTS			948.00	1038.91	109.6	70 - 130
20 PFOA			1000.00	971.27	97.1	70 - 130
D 53 13C8_PFOA	508929	520093			102.2	50 - 150
12 PFHpS			952.00	875.94	92	70 - 130
18 PFOS			928.00	937.47	101	70 - 130
D 54 13C8_PFOS	147774	144303			97.7	50 - 150
17 PFNA			1000.00	901.63	90.2	70 - 130
D 56 13C9_PFNA	632796	679562			107.4	50 - 150
30 9Cl-PF3ONS			932.00	926.44	99.4	70 - 130
D 55 13C8_PFOSA	286703	285565			99.6	50 - 150
19 PFOSA			1000.00	992.08	99.2	70 - 130
16 PFNS			960.00	945.32	98.5	70 - 130
D 65 13C2_8:2 FTS_2	108532	101289			93.3	50 - 150
10 PFDA			1000.00	944.01	94.4	70 - 130
3 8:2 FTS			958.00	820.56	85.7	70 - 130
D 51 13C6_PFDA	617850	603695			97.7	50 - 150
D 58 d3-MeFOSAA	638732	632027			99	50 - 150

Report Date: 03-Aug-2021 19:53:56 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121052.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1022.68	102.3	70 - 130
9 PFDS			964.00	1010.99	104.9	70 - 130
D 52 13C7_PFUdA	671685	663294			98.8	50 - 150
25 PFUdA			1000.00	932.33	93.2	70 - 130
D 60 d5-EtFOSAA	592168	563082			95.1	50 - 150
5 N-EtFOSAA			1000.00	1036.26	103.6	70 - 130
D 61 d7-MeFOSE	90941	83760			92.1	50 - 150
32 MeFOSE			1000.00	944.12	94.4	70 - 130
D 57 d3-MeFOSA	54238	51039			94.1	50 - 150
26 MeFOSA			1000.00	1059.77	106	70 - 130
31 11Cl-PF3OUDS			942.00	854.23	90.7	70 - 130
D 62 d9-EtFOSE	95057	97268			102.3	50 - 150
33 EtFOSE			1000.00	918.90	91.9	70 - 130
D 59 d5-EtFOSA	51944	44439			85.6	50 - 150
27 EtFOSA			1000.00	1110.29	111	70 - 130
11 PFDoA			1000.00	989.17	98.9	70 - 130
D 38 13C2_PFDoA	650962	622140			95.6	50 - 150
4 10:2 FTS			964.00	565.46	58.7	70 - 130
34 PFDOS			968.00	948.32	98	70 - 130
24 PFTrDA			1000.00	1145.24	114.5	70 - 130
23 PFTeDA			1000.00	928.19	92.8	70 - 130
D 42 13C2_PFTeDA	953398	938135			98.4	50 - 150
D 40 13C2_PFHxDA	904421	856460			94.7	50 - 150
35 PFHxDA			1000.00	1051.03	105.1	70 - 130
36 PFODA			1000.00	1011.31	101.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121064.d
Injection Date: 31-Jul-2021 23:11:23 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 57
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	659616			104.6	50 - 150
8 PFBA			1000.00	955.95	95.6	70 - 130
D 50 13C5_PFPeA	580611	641109			110.4	50 - 150
21 PFPeA			1000.00	932.10	93.2	70 - 130
7 PFBS			884.00	809.60	91.6	70 - 130
D 44 13C3_PFBS	180931	195271			107.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	100302			91.9	50 - 150
1 4:2 FTS			934.00	1002.23	107.3	70 - 130
D 49 13C5_PFHxA	669846	723344			108	50 - 150
15 PFHxA			1000.00	853.19	85.3	70 - 130
22 PFPeS			938.00	850.70	90.7	70 - 130
28 GenX			2000.00	2016.37	100.8	70 - 130
D 66 13C3_GenX	1263013	1184450			93.8	50 - 150
D 47 13C4_PFHpA	541026	594092			109.8	50 - 150
13 PFHpA			1000.00	845.60	84.6	70 - 130
D 45 13C3_PFHxS	147645	167862			113.7	50 - 150
14 PFHxS			910.00	806.56	88.6	70 - 130
29 ADONA			942.00	871.73	92.5	70 - 130
D 64 13C2_6:2 FTS_2	93519	90904			97.2	50 - 150
2 6:2 FTS			948.00	979.31	103.3	70 - 130
20 PFOA			1000.00	1014.23	101.4	70 - 130
D 53 13C8_PFOA	508929	549893			108	50 - 150
12 PFHpS			952.00	878.71	92.3	70 - 130
18 PFOS			928.00	867.09	93.4	70 - 130
D 54 13C8_PFOS	147774	166585			112.7	50 - 150
17 PFNA			1000.00	907.59	90.8	70 - 130
D 56 13C9_PFNA	632796	734455			116.1	50 - 150
30 9Cl-PF3ONS			932.00	815.24	87.5	70 - 130
D 55 13C8_PFOSA	286703	306730			107	50 - 150
19 PFOSA			1000.00	1005.87	100.6	70 - 130
16 PFNS			960.00	845.70	88.1	70 - 130
D 65 13C2_8:2 FTS_2	108532	104122			95.9	50 - 150
10 PFDA			1000.00	847.68	84.8	70 - 130
3 8:2 FTS			958.00	952.38	99.4	70 - 130
D 51 13C6_PFDA	617850	718232			116.2	50 - 150
D 58 d3-MeFOSAA	638732	631226			98.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1055.69	105.6	70 - 130
9 PFDS			964.00	858.33	89	70 - 130
D 52 13C7_PFUdA	671685	754230			112.3	50 - 150
25 PFUdA			1000.00	939.78	94	70 - 130
D 60 d5-EtFOSAA	592168	598063			101	50 - 150
5 N-EtFOSAA			1000.00	1001.42	100.1	70 - 130
D 61 d7-MeFOSE	90941	83481			91.8	50 - 150
32 MeFOSE			1000.00	1036.03	103.6	70 - 130
D 57 d3-MeFOSA	54238	50069			92.3	50 - 150
26 MeFOSA			1000.00	1174.79	117.5	70 - 130
31 11Cl-PF3OUDS			942.00	865.35	91.9	70 - 130
D 62 d9-EtFOSE	95057	104693			110.1	50 - 150
33 EtFOSE			1000.00	867.32	86.7	70 - 130
D 59 d5-EtFOSA	51944	52139			100.4	50 - 150
27 EtFOSA			1000.00	1066.76	106.7	70 - 130
11 PFDoA			1000.00	1017.09	101.7	70 - 130
D 38 13C2_PFDoA	650962	699334			107.4	50 - 150
4 10:2 FTS			964.00	725.40	75.2	70 - 130
34 PFDOS			968.00	895.15	92.5	70 - 130
24 PFTrDA			1000.00	1104.07	110.4	70 - 130
23 PFTeDA			1000.00	856.59	85.7	70 - 130
D 42 13C2_PFTeDA	953398	1131177			118.6	50 - 150
D 40 13C2_PFHxDA	904421	943368			104.3	50 - 150
35 PFHxDA			1000.00	1085.13	108.5	70 - 130
36 PFODA			1000.00	1024.25	102.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121072.d
Injection Date: 01-Aug-2021 00:36:49 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 65
Sample Info: ID CCV 1000D_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	685378			108.7	50 - 150
8 PFBA			1000.00	926.89	92.7	70 - 130
D 50 13C5_PFPeA	580611	650218			112	50 - 150
21 PFPeA			1000.00	879.27	87.9	70 - 130
7 PFBS			884.00	783.26	88.6	70 - 130
D 44 13C3_PFBS	180931	205782			113.7	50 - 150
D 63 13C2_4:2 FTS_2	109162	99884			91.5	50 - 150
1 4:2 FTS			934.00	1062.33	113.7	70 - 130
D 49 13C5_PFHxA	669846	746812			111.5	50 - 150
15 PFHxA			1000.00	854.67	85.5	70 - 130
22 PFPeS			938.00	754.46	80.4	70 - 130
28 GenX			2000.00	2018.65	100.9	70 - 130
D 66 13C3_GenX	1263013	1208923			95.7	50 - 150
D 47 13C4_PFHpA	541026	590171			109.1	50 - 150
13 PFHpA			1000.00	939.31	93.9	70 - 130
D 45 13C3_PFHxS	147645	174499			118.2	50 - 150
14 PFHxS			910.00	779.90	85.7	70 - 130
29 ADONA			942.00	846.07	89.8	70 - 130
D 64 13C2_6:2 FTS_2	93519	96789			103.5	50 - 150
2 6:2 FTS			948.00	1035.28	109.2	70 - 130
20 PFOA			1000.00	970.89	97.1	70 - 130
D 53 13C8_PFOA	508929	564751			111	50 - 150
12 PFHpS			952.00	816.79	85.8	70 - 130
18 PFOS			928.00	857.78	92.4	70 - 130
D 54 13C8_PFOS	147774	162659			110.1	50 - 150
17 PFNA			1000.00	950.29	95	70 - 130
D 56 13C9_PFNA	632796	704499			111.3	50 - 150
30 9Cl-PF3ONS			932.00	846.36	90.8	70 - 130
D 55 13C8_PFOSA	286703	291887			101.8	50 - 150
19 PFOSA			1000.00	1025.10	102.5	70 - 130
16 PFNS			960.00	877.73	91.4	70 - 130
D 65 13C2_8:2 FTS_2	108532	109938			101.3	50 - 150
10 PFDA			1000.00	968.24	96.8	70 - 130
3 8:2 FTS			958.00	923.65	96.4	70 - 130
D 51 13C6_PFDA	617850	661395			107	50 - 150
D 58 d3-MeFOSAA	638732	663613			103.9	50 - 150

Report Date: 03-Aug-2021 19:54:08 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121072.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	999.05	99.9	70 - 130
9 PFDS			964.00	1004.42	104.2	70 - 130
D 52 13C7_PFUdA	671685	738423			109.9	50 - 150
25 PFUdA			1000.00	920.43	92	70 - 130
D 60 d5-EtFOSAA	592168	609303			102.9	50 - 150
5 N-EtFOSAA			1000.00	958.67	95.9	70 - 130
D 61 d7-MeFOSE	90941	85167			93.7	50 - 150
32 MeFOSE			1000.00	1023.20	102.3	70 - 130
D 57 d3-MeFOSA	54238	55678			102.7	50 - 150
26 MeFOSA			1000.00	1221.62	122.2	70 - 130
31 11Cl-PF3OUDS			942.00	853.32	90.6	70 - 130
D 62 d9-EtFOSE	95057	112654			118.5	50 - 150
33 EtFOSE			1000.00	871.79	87.2	70 - 130
D 59 d5-EtFOSA	51944	49786			95.8	50 - 150
27 EtFOSA			1000.00	1067.92	106.8	70 - 130
11 PFDoA			1000.00	1041.78	104.2	70 - 130
D 38 13C2_PFDoA	650962	703014			108	50 - 150
4 10:2 FTS			964.00	627.59	65.1	70 - 130
34 PFDOS			968.00	907.38	93.7	70 - 130
24 PFTrDA			1000.00	1090.36	109	70 - 130
23 PFTeDA			1000.00	928.40	92.8	70 - 130
D 42 13C2_PFTeDA	953398	1039288			109	50 - 150
D 40 13C2_PFHxDA	904421	913959			101.1	50 - 150
35 PFHxDA			1000.00	1066.12	106.6	70 - 130
36 PFODA			1000.00	1025.79	102.6	70 - 130

NO SAMPLES AFFECTED

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421005.d
Injection Date: 04-Aug-2021 12:17:56 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	627821			111.5	50 - 150
8 PFBA			100.00	106.23	106.2	70 - 130
D 50 13C5_PFPeA	523546	594861			113.6	50 - 150
21 PFPeA			100.00	104.33	104.3	70 - 130
7 PFBS			88.400	79.859	90.3	70 - 130
D 44 13C3_PFBS	169277	191316			113	50 - 150
D 63 13C2_4:2 FTS_2	90196	113853			126.2	50 - 150
1 4:2 FTS			93.400	102.09	109.3	70 - 130
D 49 13C5_PFHxA	600114	699983			116.6	50 - 150
15 PFHxA			100.00	96.520	96.5	70 - 130
22 PFPeS			93.800	92.609	98.7	70 - 130
28 GenX			200.00	234.28	117.1	70 - 130
D 66 13C3_GenX	1000599	1232176			123.1	50 - 150
D 47 13C4_PFHpA	482787	563315			116.7	50 - 150
13 PFHpA			100.00	96.178	96.2	70 - 130
D 45 13C3_PFHxS	137682	162707			118.2	50 - 150
14 PFHxS			91.000	89.810	98.7	70 - 130
29 ADONA			94.200	85.090	90.3	70 - 130
D 64 13C2_6:2 FTS_2	77321	94624			122.4	50 - 150
2 6:2 FTS			94.800	140.21	147.9	70 - 130
20 PFOA			100.00	113.13	113.1	70 - 130
D 53 13C8_PFOA	538966	520722			96.6	50 - 150
12 PFHpS			95.200	83.832	88.1	70 - 130
18 PFOS			92.800	75.514	81.4	70 - 130
D 54 13C8_PFOS	139992	155583			111.1	50 - 150
17 PFNA			100.00	97.418	97.4	70 - 130
D 56 13C9_PFNA	618881	683223			110.4	50 - 150
30 9Cl-PF3ONS			93.200	87.315	93.7	70 - 130
D 55 13C8_PFOSA	250019	335834			134.3	50 - 150
19 PFOSA			100.00	96.022	96	70 - 130
16 PFNS			96.000	88.213	91.9	70 - 130
D 65 13C2_8:2 FTS_2	72182	109751			152	50 - 150
10 PFDA			100.00	100.08	100.1	70 - 130
3 8:2 FTS			95.800	90.853	94.8	70 - 130
D 51 13C6_PFDA	590501	632664			107.1	50 - 150
D 58 d3-MeFOSAA	601725	796771			132.4	50 - 150

Report Date: 05-Aug-2021 18:39:10 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	103.16	103.2	70 - 130
9 PFDS			96.400	90.171	93.5	70 - 130
D 52 13C7_PFUdA	707587	654046			92.4	50 - 150
25 PFUdA			100.00	105.63	105.6	70 - 130
D 60 d5-EtFOSAA	521292	676164			129.7	50 - 150
5 N-EtFOSAA			100.00	103.62	103.6	70 - 130
D 61 d7-MeFOSE	68295	81562			119.4	50 - 150
32 MeFOSE			100.00	107.41	107.4	70 - 130
D 57 d3-MeFOSA	40777	50898			124.8	50 - 150
26 MeFOSA			100.00	135.36	135.4	70 - 130
31 11Cl-PF3OUDS			94.200	86.062	91.4	70 - 130
D 62 d9-EtFOSE	68452	105638			154.3	50 - 150
33 EtFOSE			100.00	112.41	112.4	70 - 130
D 59 d5-EtFOSA	38025	45744			120.3	50 - 150
27 EtFOSA			100.00	87.401	87.4	70 - 130
11 PFDoA			100.00	100.59	100.6	70 - 130
D 38 13C2_PFDoA	745164	722764			97	50 - 150
4 10:2 FTS			96.400	57.971	60.1	70 - 130
34 PFDOS			96.800	104.58	108	70 - 130
24 PFTrDA			100.00	108.49	108.5	70 - 130
23 PFTeDA			100.00	103.92	103.9	70 - 130
D 42 13C2_PFTeDA	846373	1022490			120.8	50 - 150
D 40 13C2_PFHxDA	768834	983864			128	50 - 150
35 PFHxDA			100.00	111.08	111.1	70 - 130
36 PFODA			100.00	102.94	102.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421006.d
Injection Date: 04-Aug-2021 12:28:33 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	626953			99.9	50 - 150
8 PFBA			200.00	216.75	108.4	70 - 130
D 50 13C5_PFPeA	594861	597098			100.4	50 - 150
21 PFPeA			200.00	196.29	98.1	70 - 130
7 PFBS			176.80	182.10	103	70 - 130
D 44 13C3_PFBS	191316	189948			99.3	50 - 150
D 63 13C2_4:2 FTS_2	113853	121584			106.8	50 - 150
1 4:2 FTS			186.80	168.94	90.4	70 - 130
D 49 13C5_PFHxA	699983	690179			98.6	50 - 150
15 PFHxA			200.00	210.78	105.4	70 - 130
22 PFPeS			187.60	185.49	98.9	70 - 130
28 GenX			400.00	380.34	95.1	70 - 130
D 66 13C3_GenX	1232176	1271693			103.2	50 - 150
D 47 13C4_PFHpA	563315	550332			97.7	50 - 150
13 PFHpA			200.00	180.72	90.4	70 - 130
D 45 13C3_PFHxS	162707	152605			93.8	50 - 150
14 PFHxS			182.00	172.20	94.6	70 - 130
29 ADONA			188.40	196.01	104	70 - 130
D 64 13C2_6:2 FTS_2	94624	99579			105.2	50 - 150
2 6:2 FTS			189.60	224.92	118.6	70 - 130
20 PFOA			200.00	219.57	109.8	70 - 130
D 53 13C8_PFOA	520722	528847			101.6	50 - 150
12 PFHpS			190.40	206.46	108.4	70 - 130
18 PFOS			185.60	185.39	99.9	70 - 130
D 54 13C8_PFOS	155583	152075			97.7	50 - 150
17 PFNA			200.00	205.59	102.8	70 - 130
D 56 13C9_PFNA	683223	675589			98.9	50 - 150
30 9Cl-PF3ONS			186.40	192.68	103.4	70 - 130
D 55 13C8_PFOSA	335834	326589			97.2	50 - 150
19 PFOSA			200.00	200.42	100.2	70 - 130
16 PFNS			192.00	194.28	101.2	70 - 130
D 65 13C2_8:2 FTS_2	109751	110281			100.5	50 - 150
10 PFDA			200.00	218.92	109.5	70 - 130
3 8:2 FTS			191.60	195.89	102.2	70 - 130
D 51 13C6_PFDA	632664	634461			100.3	50 - 150
D 58 d3-MeFOSAA	796771	764302			95.9	50 - 150

Report Date: 05-Aug-2021 18:39:11 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	211.18	105.6	70 - 130
9 PFDS			192.80	181.79	94.3	70 - 130
D 52 13C7_PFUdA	654046	693045			106	50 - 150
25 PFUdA			200.00	196.96	98.5	70 - 130
D 60 d5-EtFOSAA	676164	697660			103.2	50 - 150
5 N-EtFOSAA			200.00	179.38	89.7	70 - 130
D 61 d7-MeFOSE	81562	88988			109.1	50 - 150
32 MeFOSE			200.00	219.72	109.9	70 - 130
D 57 d3-MeFOSA	50898	56608			111.2	50 - 150
26 MeFOSA			200.00	241.39	120.7	70 - 130
31 11Cl-PF3OUDS			188.40	178.57	94.8	70 - 130
D 62 d9-EtFOSE	105638	103567			98	50 - 150
33 EtFOSE			200.00	166.18	83.1	70 - 130
D 59 d5-EtFOSA	45744	46198			101	50 - 150
27 EtFOSA			200.00	223.12	111.6	70 - 130
11 PFDoA			200.00	196.25	98.1	70 - 130
D 38 13C2_PFDoA	722764	717304			99.2	50 - 150
4 10:2 FTS			192.80	118.55	61.5	70 - 130
34 PFDOS			193.60	199.99	103.3	70 - 130
24 PFTrDA			200.00	227.68	113.8	70 - 130
23 PFTeDA			200.00	193.79	96.9	70 - 130
D 42 13C2_PFTeDA	1022490	1043732			102.1	50 - 150
D 40 13C2_PFHxDA	983864	1008178			102.5	50 - 150
35 PFHxDA			200.00	217.28	108.6	70 - 130
36 PFODA			200.00	208.91	104.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421025.d
Injection Date: 04-Aug-2021 15:50:19 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 17
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	674504			107.4	50 - 150
8 PFBA			1000.00	922.26	92.2	70 - 130
D 50 13C5_PFPeA	594861	647586			108.9	50 - 150
21 PFPeA			1000.00	866.77	86.7	70 - 130
7 PFBS			884.00	815.95	92.3	70 - 130
D 44 13C3_PFBS	191316	202893			106.1	50 - 150
D 63 13C2_4:2 FTS_2	113853	116685			102.5	50 - 150
1 4:2 FTS			934.00	1005.49	107.7	70 - 130
D 49 13C5_PFHxA	699983	706835			101	50 - 150
15 PFHxA			1000.00	927.08	92.7	70 - 130
22 PFPeS			938.00	856.28	91.3	70 - 130
28 GenX			2000.00	1819.21	91	70 - 130
D 66 13C3_GenX	1232176	1250182			101.5	50 - 150
D 47 13C4_PFHpA	563315	622469			110.5	50 - 150
13 PFHpA			1000.00	870.85	87.1	70 - 130
D 45 13C3_PFHxS	162707	166597			102.4	50 - 150
14 PFHxS			910.00	858.35	94.3	70 - 130
29 ADONA			942.00	907.07	96.3	70 - 130
D 64 13C2_6:2 FTS_2	94624	90068			95.2	50 - 150
2 6:2 FTS			948.00	1187.45	125.3	70 - 130
20 PFOA			1000.00	931.57	93.2	70 - 130
D 53 13C8_PFOA	520722	563553			108.2	50 - 150
12 PFHpS			952.00	858.86	90.2	70 - 130
18 PFOS			928.00	859.93	92.7	70 - 130
D 54 13C8_PFOS	155583	165152			106.2	50 - 150
17 PFNA			1000.00	946.84	94.7	70 - 130
D 56 13C9_PFNA	683223	695758			101.8	50 - 150
30 9Cl-PF3ONS			932.00	861.47	92.4	70 - 130
D 55 13C8_PFOSA	335834	286082			85.2	50 - 150
19 PFOSA			1000.00	1013.34	101.3	70 - 130
16 PFNS			960.00	836.35	87.1	70 - 130
D 65 13C2_8:2 FTS_2	109751	100974			92	50 - 150
10 PFDA			1000.00	848.20	84.8	70 - 130
3 8:2 FTS			958.00	941.74	98.3	70 - 130
D 51 13C6_PFDA	632664	680660			107.6	50 - 150
D 58 d3-MeFOSAA	796771	745982			93.6	50 - 150

Report Date: 05-Aug-2021 18:39:26 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421025.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1063.75	106.4	70 - 130
9 PFDS			964.00	925.26	96	70 - 130
D 52 13C7_PFUdA	654046	810613			123.9	50 - 150
25 PFUdA			1000.00	832.61	83.3	70 - 130
D 60 d5-EtFOSAA	676164	692730			102.4	50 - 150
5 N-EtFOSAA			1000.00	975.02	97.5	70 - 130
D 61 d7-MeFOSE	81562	87121			106.8	50 - 150
32 MeFOSE			1000.00	1066.14	106.6	70 - 130
D 57 d3-MeFOSA	50898	52628			103.4	50 - 150
26 MeFOSA			1000.00	1094.00	109.4	70 - 130
31 11Cl-PF3OUDS			942.00	878.21	93.2	70 - 130
D 62 d9-EtFOSE	105638	101672			96.2	50 - 150
33 EtFOSE			1000.00	928.90	92.9	70 - 130
D 59 d5-EtFOSA	45744	49479			108.2	50 - 150
27 EtFOSA			1000.00	1000.76	100.1	70 - 130
11 PFDoA			1000.00	900.75	90.1	70 - 130
D 38 13C2_PFDoA	722764	729690			101	50 - 150
4 10:2 FTS			964.00	572.67	59.4	70 - 130
34 PFDOS			968.00	903.23	93.3	70 - 130
24 PFTrDA			1000.00	1031.79	103.2	70 - 130
23 PFTeDA			1000.00	937.97	93.8	70 - 130
D 42 13C2_PFTeDA	1022490	1040010			101.7	50 - 150
D 40 13C2_PFHxDA	983864	952729			96.8	50 - 150
35 PFHxDA			1000.00	1056.29	105.6	70 - 130
36 PFODA			1000.00	1024.08	102.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421039.d
Injection Date: 04-Aug-2021 18:19:17 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	687846			109.6	50 - 150
8 PFBA			1000.00	934.59	93.5	70 - 130
D 50 13C5_PFPeA	594861	663496			111.5	50 - 150
21 PFPeA			1000.00	914.47	91.4	70 - 130
7 PFBS			884.00	774.29	87.6	70 - 130
D 44 13C3_PFBS	191316	216780			113.3	50 - 150
D 63 13C2_4:2 FTS_2	113853	106230			93.3	50 - 150
1 4:2 FTS			934.00	1047.05	112.1	70 - 130
D 49 13C5_PFHxA	699983	771560			110.2	50 - 150
15 PFHxA			1000.00	880.06	88	70 - 130
22 PFPeS			938.00	833.61	88.9	70 - 130
28 GenX			2000.00	1986.83	99.3	70 - 130
D 66 13C3_GenX	1232176	1263846			102.6	50 - 150
D 47 13C4_PFHpA	563315	589510			104.7	50 - 150
13 PFHpA			1000.00	932.60	93.3	70 - 130
D 45 13C3_PFHxS	162707	175846			108.1	50 - 150
14 PFHxS			910.00	817.19	89.8	70 - 130
29 ADONA			942.00	900.75	95.6	70 - 130
D 64 13C2_6:2 FTS_2	94624	92999			98.3	50 - 150
2 6:2 FTS			948.00	1240.51	130.9	70 - 130
20 PFOA			1000.00	935.83	93.6	70 - 130
D 53 13C8_PFOA	520722	598506			114.9	50 - 150
12 PFHpS			952.00	883.11	92.8	70 - 130
18 PFOS			928.00	853.90	92	70 - 130
D 54 13C8_PFOS	155583	178390			114.7	50 - 150
17 PFNA			1000.00	905.56	90.6	70 - 130
D 56 13C9_PFNA	683223	751203			109.9	50 - 150
30 9Cl-PF3ONS			932.00	832.52	89.3	70 - 130
D 55 13C8_PFOSA	335834	332349			99	50 - 150
19 PFOSA			1000.00	971.98	97.2	70 - 130
16 PFNS			960.00	859.17	89.5	70 - 130
D 65 13C2_8:2 FTS_2	109751	109775			100	50 - 150
10 PFDA			1000.00	934.72	93.5	70 - 130
3 8:2 FTS			958.00	1027.31	107.2	70 - 130
D 51 13C6_PFDA	632664	761622			120.4	50 - 150
D 58 d3-MeFOSAA	796771	774583			97.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1111.17	111.1	70 - 130
9 PFDS			964.00	915.02	94.9	70 - 130
D 52 13C7_PFUdA	654046	756488			115.7	50 - 150
25 PFUdA			1000.00	916.96	91.7	70 - 130
D 60 d5-EtFOSAA	676164	711308			105.2	50 - 150
5 N-EtFOSAA			1000.00	1015.07	101.5	70 - 130
D 61 d7-MeFOSE	81562	92288			113.2	50 - 150
32 MeFOSE			1000.00	1053.18	105.3	70 - 130
D 57 d3-MeFOSA	50898	61123			120.1	50 - 150
26 MeFOSA			1000.00	1092.36	109.2	70 - 130
31 11Cl-PF3OUDS			942.00	840.79	89.3	70 - 130
D 62 d9-EtFOSE	105638	101426			96	50 - 150
33 EtFOSE			1000.00	944.82	94.5	70 - 130
D 59 d5-EtFOSA	45744	49405			108	50 - 150
27 EtFOSA			1000.00	1043.38	104.3	70 - 130
11 PFDoA			1000.00	971.20	97.1	70 - 130
D 38 13C2_PFDoA	722764	751320			104	50 - 150
4 10:2 FTS			964.00	576.27	59.8	70 - 130
34 PFDOS			968.00	904.38	93.4	70 - 130
24 PFTrDA			1000.00	1024.17	102.4	70 - 130
23 PFTeDA			1000.00	913.39	91.3	70 - 130
D 42 13C2_PFTeDA	1022490	1127630			110.3	50 - 150
D 40 13C2_PFHxDA	983864	994460			101.1	50 - 150
35 PFHxDA			1000.00	1065.32	106.5	70 - 130
36 PFODA			1000.00	1022.25	102.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421051.d
Injection Date: 04-Aug-2021 20:26:55 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 43
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	689587			109.8	50 - 150
8 PFBA			1000.00	939.98	94	70 - 130
D 50 13C5_PFPeA	594861	658620			110.7	50 - 150
21 PFPeA			1000.00	874.82	87.5	70 - 130
7 PFBS			884.00	798.87	90.4	70 - 130
D 44 13C3_PFBS	191316	199806			104.4	50 - 150
D 63 13C2_4:2 FTS_2	113853	117507			103.2	50 - 150
1 4:2 FTS			934.00	874.80	93.7	70 - 130
D 49 13C5_PFHxA	699983	736328			105.2	50 - 150
15 PFHxA			1000.00	952.53	95.3	70 - 130
22 PFPeS			938.00	911.25	97.1	70 - 130
28 GenX			2000.00	2050.66	102.5	70 - 130
D 66 13C3_GenX	1232176	1189675			96.6	50 - 150
D 47 13C4_PFHpA	563315	581559			103.2	50 - 150
13 PFHpA			1000.00	912.43	91.2	70 - 130
D 45 13C3_PFHxS	162707	176159			108.3	50 - 150
14 PFHxS			910.00	846.79	93.1	70 - 130
29 ADONA			942.00	887.96	94.3	70 - 130
D 64 13C2_6:2 FTS_2	94624	90899			96.1	50 - 150
2 6:2 FTS			948.00	1228.71	129.6	70 - 130
20 PFOA			1000.00	950.22	95	70 - 130
D 53 13C8_PFOA	520722	594753			114.2	50 - 150
12 PFHpS			952.00	874.31	91.8	70 - 130
18 PFOS			928.00	832.57	89.7	70 - 130
D 54 13C8_PFOS	155583	168974			108.6	50 - 150
17 PFNA			1000.00	900.95	90.1	70 - 130
D 56 13C9_PFNA	683223	741303			108.5	50 - 150
30 9Cl-PF3ONS			932.00	903.14	96.9	70 - 130
D 55 13C8_PFOSA	335834	319166			95	50 - 150
19 PFOSA			1000.00	893.47	89.3	70 - 130
16 PFNS			960.00	896.98	93.4	70 - 130
D 65 13C2_8:2 FTS_2	109751	111620			101.7	50 - 150
10 PFDA			1000.00	933.37	93.3	70 - 130
3 8:2 FTS			958.00	1000.43	104.4	70 - 130
D 51 13C6_PFDA	632664	726213			114.8	50 - 150
D 58 d3-MeFOSAA	796771	768314			96.4	50 - 150

Report Date: 05-Aug-2021 18:39:48 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421051.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1103.56	110.4	70 - 130
9 PFDS			964.00	934.16	96.9	70 - 130
D 52 13C7_PFUdA	654046	786576			120.3	50 - 150
25 PFUdA			1000.00	933.69	93.4	70 - 130
D 60 d5-EtFOSAA	676164	763594			112.9	50 - 150
5 N-EtFOSAA			1000.00	970.24	97	70 - 130
D 61 d7-MeFOSE	81562	96830			118.7	50 - 150
32 MeFOSE			1000.00	868.67	86.9	70 - 130
D 57 d3-MeFOSA	50898	52322			102.8	50 - 150
26 MeFOSA			1000.00	1112.65	111.3	70 - 130
31 11Cl-PF3OUDS			942.00	827.48	87.8	70 - 130
D 62 d9-EtFOSE	105638	107175			101.5	50 - 150
33 EtFOSE			1000.00	945.67	94.6	70 - 130
D 59 d5-EtFOSA	45744	47363			103.5	50 - 150
27 EtFOSA			1000.00	1120.59	112.1	70 - 130
11 PFDoA			1000.00	950.57	95.1	70 - 130
D 38 13C2_PFDoA	722764	749370			103.7	50 - 150
4 10:2 FTS			964.00	616.29	63.9	70 - 130
34 PFDOS			968.00	863.59	89.2	70 - 130
24 PFTrDA			1000.00	992.17	99.2	70 - 130
23 PFTeDA			1000.00	912.33	91.2	70 - 130
D 42 13C2_PFTeDA	1022490	1112132			108.8	50 - 150
D 40 13C2_PFHxDA	983864	1021329			103.8	50 - 150
35 PFHxDA			1000.00	1055.17	105.5	70 - 130
36 PFODA			1000.00	999.10	99.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421068.d
Injection Date: 04-Aug-2021 23:28:01 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 60
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	665290			106	50 - 150
8 PFBA			1000.00	956.43	95.6	70 - 130
D 50 13C5_PFPeA	594861	652695			109.7	50 - 150
21 PFPeA			1000.00	916.23	91.6	70 - 130
7 PFBS			884.00	796.90	90.1	70 - 130
D 44 13C3_PFBS	191316	211767			110.7	50 - 150
D 63 13C2_4:2 FTS_2	113853	114508			100.6	50 - 150
1 4:2 FTS			934.00	935.78	100.2	70 - 130
D 49 13C5_PFHxA	699983	765686			109.4	50 - 150
15 PFHxA			1000.00	846.37	84.6	70 - 130
22 PFPeS			938.00	859.87	91.7	70 - 130
28 GenX			2000.00	1899.72	95	70 - 130
D 66 13C3_GenX	1232176	1238957			100.6	50 - 150
D 47 13C4_PFHpA	563315	602293			106.9	50 - 150
13 PFHpA			1000.00	879.30	87.9	70 - 130
D 45 13C3_PFHxS	162707	180556			111	50 - 150
14 PFHxS			910.00	806.60	88.6	70 - 130
29 ADONA			942.00	805.12	85.5	70 - 130
D 64 13C2_6:2 FTS_2	94624	104842			110.8	50 - 150
2 6:2 FTS			948.00	1071.89	113.1	70 - 130
20 PFOA			1000.00	911.47	91.1	70 - 130
D 53 13C8_PFOA	520722	601698			115.6	50 - 150
12 PFHpS			952.00	821.82	86.3	70 - 130
18 PFOS			928.00	871.04	93.9	70 - 130
D 54 13C8_PFOS	155583	177353			114	50 - 150
17 PFNA			1000.00	886.75	88.7	70 - 130
D 56 13C9_PFNA	683223	760633			111.3	50 - 150
30 9Cl-PF3ONS			932.00	805.85	86.5	70 - 130
D 55 13C8_PFOSA	335834	314960			93.8	50 - 150
19 PFOSA			1000.00	959.73	96	70 - 130
16 PFNS			960.00	780.64	81.3	70 - 130
D 65 13C2_8:2 FTS_2	109751	109716			100	50 - 150
10 PFDA			1000.00	877.57	87.8	70 - 130
3 8:2 FTS			958.00	965.44	100.8	70 - 130
D 51 13C6_PFDA	632664	723352			114.3	50 - 150
D 58 d3-MeFOSAA	796771	833146			104.6	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	941.22	94.1	70 - 130
9 PFDS			964.00	854.93	88.7	70 - 130
D 52 13C7_PFUdA	654046	739956			113.1	50 - 150
25 PFUdA			1000.00	990.45	99	70 - 130
D 60 d5-EtFOSAA	676164	754231			111.5	50 - 150
5 N-EtFOSAA			1000.00	912.86	91.3	70 - 130
D 61 d7-MeFOSE	81562	96207			118	50 - 150
32 MeFOSE			1000.00	1001.71	100.2	70 - 130
D 57 d3-MeFOSA	50898	53267			104.7	50 - 150
26 MeFOSA			1000.00	1264.44	126.4	70 - 130
31 11Cl-PF3OUDS			942.00	802.24	85.2	70 - 130
D 62 d9-EtFOSE	105638	103304			97.8	50 - 150
33 EtFOSE			1000.00	986.21	98.6	70 - 130
D 59 d5-EtFOSA	45744	49849			109	50 - 150
27 EtFOSA			1000.00	1019.93	102	70 - 130
11 PFDoA			1000.00	892.33	89.2	70 - 130
D 38 13C2_PFDoA	722764	789098			109.2	50 - 150
4 10:2 FTS			964.00	697.02	72.3	70 - 130
34 PFDOS			968.00	874.93	90.4	70 - 130
24 PFTrDA			1000.00	992.39	99.2	70 - 130
23 PFTeDA			1000.00	904.05	90.4	70 - 130
D 42 13C2_PFTeDA	1022490	1157535			113.2	50 - 150
D 40 13C2_PFHxDA	983864	1062635			108	50 - 150
35 PFHxDA			1000.00	1035.70	103.6	70 - 130
36 PFODA			1000.00	970.52	97.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521033.d
Injection Date: 05-Aug-2021 17:50:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 28
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1053.58	105.4	70 - 130
D 46 13C4_PFBA	574801	520148			90.5	50 - 150
D 50 13C5_PFPeA	538043	498761			92.7	50 - 150
21 PFPeA			1000.00	995.22	99.5	70 - 130
7 PFBS			884.00	906.31	102.5	70 - 130
D 44 13C3_PFBS	187099	166758			89.1	50 - 150
1 4:2 FTS			934.00	886.15	94.9	70 - 130
D 63 13C2_4:2 FTS_2	103169	93332			90.5	50 - 150
D 49 13C5_PFHxA	593317	585380			98.7	50 - 150
15 PFHxA			1000.00	1002.28	100.2	70 - 130
22 PFPeS			938.00	962.27	102.6	70 - 130
28 GenX			2000.00	2049.56	102.5	70 - 130
D 66 13C3_GenX	1107213	973569			87.9	50 - 150
D 47 13C4_PFHpA	479053	458114			95.6	50 - 150
13 PFHpA			1000.00	1003.54	100.4	70 - 130
D 45 13C3_PFHxS	139557	133587			95.7	50 - 150
14 PFHxS			910.00	901.87	99.1	70 - 130
29 ADONA			942.00	885.11	94	70 - 130
D 64 13C2_6:2 FTS_2	86994	79162			91	50 - 150
2 6:2 FTS			948.00	922.13	97.3	70 - 130
D 53 13C8_PFOA	486725	445981			91.6	50 - 150
20 PFOA			1000.00	1004.88	100.5	70 - 130
12 PFHpS			952.00	945.59	99.3	70 - 130
18 PFOS			928.00	899.40	96.9	70 - 130
D 54 13C8_PFOS	130612	134016			102.6	50 - 150
17 PFNA			1000.00	933.72	93.4	70 - 130
D 56 13C9_PFNA	580651	598155			103	50 - 150
30 9Cl-PF3ONS			932.00	897.91	96.3	70 - 130
D 55 13C8_PFOSA	268160	280646			104.7	50 - 150
19 PFOSA			1000.00	953.80	95.4	70 - 130
16 PFNS			960.00	892.78	93	70 - 130
D 65 13C2_8:2 FTS_2	97398	96551			99.1	50 - 150
3 8:2 FTS			958.00	913.89	95.4	70 - 130
10 PFDA			1000.00	901.28	90.1	70 - 130
D 51 13C6_PFDA	542953	554664			102.2	50 - 150
6 N-MeFOSAA			1000.00	955.43	95.5	70 - 130

Report Date: 06-Aug-2021 18:04:27 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521033.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	643531			107.9	50 - 150
9 PFDS			964.00	966.44	100.3	70 - 130
D 60 d5-EtFOSAA	592804	567361			95.7	50 - 150
D 52 13C7_PFUdA	631526	590027			93.4	50 - 150
5 N-EtFOSAA			1000.00	952.76	95.3	70 - 130
25 PFUdA			1000.00	992.78	99.3	70 - 130
D 61 d7-MeFOSE	89085	81112			91.1	50 - 150
32 MeFOSE			1000.00	1046.94	104.7	70 - 130
D 57 d3-MeFOSA	50589	47602			94.1	50 - 150
26 MeFOSA			1000.00	1173.61	117.4	70 - 130
31 11Cl-PF3OUDS			942.00	916.03	97.2	70 - 130
D 62 d9-EtFOSE	90529	94382			104.3	50 - 150
33 EtFOSE			1000.00	1065.48	106.5	70 - 130
D 59 d5-EtFOSA	43442	46837			107.8	50 - 150
27 EtFOSA			1000.00	878.51	87.9	70 - 130
11 PFDoA			1000.00	995.02	99.5	70 - 130
D 38 13C2_PFDoA	595792	564744			94.8	50 - 150
4 10:2 FTS			964.00	991.50	102.9	70 - 130
34 PFDOS			968.00	938.34	96.9	70 - 130
24 PFTrDA			1000.00	1024.92	102.5	70 - 130
23 PFTeDA			1000.00	1060.20	106	70 - 130
D 42 13C2_PFTeDA	902749	841479			93.2	50 - 150
35 PFHxDA			1000.00	979.19	97.9	70 - 130
D 40 13C2_PFHxDA	845704	825331			97.6	50 - 150
36 PFODA			1000.00	997.20	99.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521046.d
Injection Date: 05-Aug-2021 20:09:03 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 41
Sample Info: ID CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	994.13	99.4	70 - 130
D 46 13C4_PFBA	574801	559210			97.3	50 - 150
D 50 13C5_PFPeA	538043	518239			96.3	50 - 150
21 PFPeA			1000.00	998.95	99.9	70 - 130
7 PFBS			884.00	878.04	99.3	70 - 130
D 44 13C3_PFBS	187099	184758			98.7	50 - 150
1 4:2 FTS			934.00	890.56	95.3	70 - 130
D 63 13C2_4:2 FTS_2	103169	104687			101.5	50 - 150
D 49 13C5_PFHxA	593317	588586			99.2	50 - 150
15 PFHxA			1000.00	983.59	98.4	70 - 130
22 PFPeS			938.00	855.47	91.2	70 - 130
28 GenX			2000.00	1938.14	96.9	70 - 130
D 66 13C3_GenX	1107213	1097664			99.1	50 - 150
D 47 13C4_PFHpA	479053	480426			100.3	50 - 150
13 PFHpA			1000.00	1009.55	101	70 - 130
D 45 13C3_PFHxS	139557	132154			94.7	50 - 150
14 PFHxS			910.00	895.55	98.4	70 - 130
29 ADONA			942.00	952.99	101.2	70 - 130
D 64 13C2_6:2 FTS_2	86994	80335			92.3	50 - 150
2 6:2 FTS			948.00	906.49	95.6	70 - 130
D 53 13C8_PFOA	486725	472810			97.1	50 - 150
20 PFOA			1000.00	1008.79	100.9	70 - 130
12 PFHpS			952.00	1033.50	108.6	70 - 130
18 PFOS			928.00	910.82	98.1	70 - 130
D 54 13C8_PFOS	130612	130971			100.3	50 - 150
17 PFNA			1000.00	971.52	97.2	70 - 130
D 56 13C9_PFNA	580651	594899			102.5	50 - 150
30 9Cl-PF3ONS			932.00	894.15	95.9	70 - 130
D 55 13C8_PFOSA	268160	284434			106.1	50 - 150
19 PFOSA			1000.00	956.36	95.6	70 - 130
16 PFNS			960.00	966.53	100.7	70 - 130
D 65 13C2_8:2 FTS_2	97398	99614			102.3	50 - 150
3 8:2 FTS			958.00	925.77	96.6	70 - 130
10 PFDA			1000.00	991.82	99.2	70 - 130
D 51 13C6_PFDA	542953	553083			101.9	50 - 150
6 N-MeFOSAA			1000.00	987.28	98.7	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	646576			108.4	50 - 150
9 PFDS			964.00	943.13	97.8	70 - 130
D 60 d5-EtFOSAA	592804	569512			96.1	50 - 150
D 52 13C7_PFUdA	631526	598172			94.7	50 - 150
5 N-EtFOSAA			1000.00	992.20	99.2	70 - 130
25 PFUdA			1000.00	997.85	99.8	70 - 130
D 61 d7-MeFOSE	89085	79332			89.1	50 - 150
32 MeFOSE			1000.00	986.63	98.7	70 - 130
D 57 d3-MeFOSA	50589	53587			105.9	50 - 150
26 MeFOSA			1000.00	943.06	94.3	70 - 130
31 11Cl-PF3OUDS			942.00	933.57	99.1	70 - 130
D 62 d9-EtFOSE	90529	102802			113.6	50 - 150
33 EtFOSE			1000.00	1005.30	100.5	70 - 130
D 59 d5-EtFOSA	43442	47297			108.9	50 - 150
27 EtFOSA			1000.00	982.12	98.2	70 - 130
11 PFDoA			1000.00	1052.18	105.2	70 - 130
D 38 13C2_PFDoA	595792	585725			98.3	50 - 150
4 10:2 FTS			964.00	812.10	84.2	70 - 130
34 PFDOS			968.00	1001.15	103.4	70 - 130
24 PFTrDA			1000.00	1012.31	101.2	70 - 130
23 PFTeDA			1000.00	1010.37	101	70 - 130
D 42 13C2_PFTeDA	902749	856905			94.9	50 - 150
35 PFHxDA			1000.00	1004.13	100.4	70 - 130
D 40 13C2_PFHxDA	845704	833630			98.6	50 - 150
36 PFODA			1000.00	1015.55	101.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521063.d
Injection Date: 05-Aug-2021 23:10:09 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 58
Sample Info: ID CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1008.80	100.9	70 - 130
D 46 13C4_PFBA	574801	541416			94.2	50 - 150
D 50 13C5_PFPeA	538043	521356			96.9	50 - 150
21 PFPeA			1000.00	1000.12	100	70 - 130
7 PFBS			884.00	925.46	104.7	70 - 130
D 44 13C3_PFBS	187099	179951			96.2	50 - 150
1 4:2 FTS			934.00	998.36	106.9	70 - 130
D 63 13C2_4:2 FTS_2	103169	97774			94.8	50 - 150
D 49 13C5_PFHxA	593317	621047			104.7	50 - 150
15 PFHxA			1000.00	892.01	89.2	70 - 130
22 PFPeS			938.00	924.19	98.5	70 - 130
28 GenX			2000.00	1947.00	97.4	70 - 130
D 66 13C3_GenX	1107213	1096856			99.1	50 - 150
D 47 13C4_PFHpA	479053	538047			112.3	50 - 150
13 PFHpA			1000.00	898.11	89.8	70 - 130
D 45 13C3_PFHxS	139557	138199			99	50 - 150
14 PFHxS			910.00	939.71	103.3	70 - 130
29 ADONA			942.00	916.90	97.3	70 - 130
D 64 13C2_6:2 FTS_2	86994	83386			95.9	50 - 150
2 6:2 FTS			948.00	916.69	96.7	70 - 130
D 53 13C8_PFOA	486725	485936			99.8	50 - 150
20 PFOA			1000.00	964.23	96.4	70 - 130
12 PFHpS			952.00	1041.82	109.4	70 - 130
18 PFOS			928.00	865.48	93.3	70 - 130
D 54 13C8_PFOS	130612	137716			105.4	50 - 150
17 PFNA			1000.00	998.32	99.8	70 - 130
D 56 13C9_PFNA	580651	586407			101	50 - 150
30 9Cl-PF3ONS			932.00	890.08	95.5	70 - 130
D 55 13C8_PFOSA	268160	275293			102.7	50 - 150
19 PFOSA			1000.00	956.68	95.7	70 - 130
16 PFNS			960.00	858.09	89.4	70 - 130
D 65 13C2_8:2 FTS_2	97398	87225			89.6	50 - 150
3 8:2 FTS			958.00	1190.72	124.3	70 - 130
10 PFDA			1000.00	993.23	99.3	70 - 130
D 51 13C6_PFDA	542953	529232			97.5	50 - 150
6 N-MeFOSAA			1000.00	909.30	90.9	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	694288			116.4	50 - 150
9 PFDS			964.00	1000.68	103.8	70 - 130
D 60 d5-EtFOSAA	592804	633679			106.9	50 - 150
D 52 13C7_PFUdA	631526	589964			93.4	50 - 150
5 N-EtFOSAA			1000.00	953.32	95.3	70 - 130
25 PFUdA			1000.00	977.75	97.8	70 - 130
D 61 d7-MeFOSE	89085	85227			95.7	50 - 150
32 MeFOSE			1000.00	1072.29	107.2	70 - 130
D 57 d3-MeFOSA	50589	51531			101.9	50 - 150
26 MeFOSA			1000.00	1009.02	100.9	70 - 130
31 11Cl-PF3OUDS			942.00	908.04	96.4	70 - 130
D 62 d9-EtFOSE	90529	98049			108.3	50 - 150
33 EtFOSE			1000.00	1069.04	106.9	70 - 130
D 59 d5-EtFOSA	43442	47639			109.7	50 - 150
27 EtFOSA			1000.00	879.26	87.9	70 - 130
11 PFDoA			1000.00	1063.52	106.4	70 - 130
D 38 13C2_PFDoA	595792	554333			93	50 - 150
4 10:2 FTS			964.00	990.78	102.8	70 - 130
34 PFDOS			968.00	924.13	95.5	70 - 130
24 PFTrDA			1000.00	1007.21	100.7	70 - 130
23 PFTeDA			1000.00	1085.34	108.5	70 - 130
D 42 13C2_PFTeDA	902749	847321			93.9	50 - 150
35 PFHxDA			1000.00	1018.30	101.8	70 - 130
D 40 13C2_PFHxDA	845704	828962			98	50 - 150
36 PFODA			1000.00	988.29	98.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521079.d
Injection Date: 06-Aug-2021 02:00:13 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 74
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	980.66	98.1	70 - 130
D 46 13C4_PFBA	574801	545821			95	50 - 150
D 50 13C5_PFPeA	538043	500058			92.9	50 - 150
21 PFPeA			1000.00	968.68	96.9	70 - 130
7 PFBS			884.00	845.52	95.6	70 - 130
D 44 13C3_PFBS	187099	181337			96.9	50 - 150
1 4:2 FTS			934.00	1038.02	111.1	70 - 130
D 63 13C2_4:2 FTS_2	103169	89274			86.5	50 - 150
D 49 13C5_PFHxA	593317	565698			95.3	50 - 150
15 PFHxA			1000.00	976.98	97.7	70 - 130
22 PFPeS			938.00	858.08	91.5	70 - 130
28 GenX			2000.00	1895.16	94.8	70 - 130
D 66 13C3_GenX	1107213	1039356			93.9	50 - 150
D 47 13C4_PFHpA	479053	476498			99.5	50 - 150
13 PFHpA			1000.00	961.09	96.1	70 - 130
D 45 13C3_PFHxS	139557	134177			96.1	50 - 150
14 PFHxS			910.00	923.20	101.5	70 - 130
29 ADONA			942.00	913.88	97	70 - 130
D 64 13C2_6:2 FTS_2	86994	85196			97.9	50 - 150
2 6:2 FTS			948.00	883.71	93.2	70 - 130
D 53 13C8_PFOA	486725	460739			94.7	50 - 150
20 PFOA			1000.00	1006.56	100.7	70 - 130
12 PFHpS			952.00	932.98	98	70 - 130
18 PFOS			928.00	908.35	97.9	70 - 130
D 54 13C8_PFOS	130612	132850			101.7	50 - 150
17 PFNA			1000.00	967.02	96.7	70 - 130
D 56 13C9_PFNA	580651	575132			99	50 - 150
30 9Cl-PF3ONS			932.00	895.24	96.1	70 - 130
D 55 13C8_PFOSA	268160	269674			100.6	50 - 150
19 PFOSA			1000.00	943.30	94.3	70 - 130
16 PFNS			960.00	970.28	101.1	70 - 130
D 65 13C2_8:2 FTS_2	97398	94325			96.8	50 - 150
3 8:2 FTS			958.00	943.77	98.5	70 - 130
10 PFDA			1000.00	934.19	93.4	70 - 130
D 51 13C6_PFDA	542953	522815			96.3	50 - 150
6 N-MeFOSAA			1000.00	1050.09	105	70 - 130

Report Date: 06-Aug-2021 18:04:06 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521079.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	652404			109.4	50 - 150
9 PFDS			964.00	930.36	96.5	70 - 130
D 60 d5-EtFOSAA	592804	601048			101.4	50 - 150
D 52 13C7_PFUdA	631526	574892			91	50 - 150
5 N-EtFOSAA			1000.00	951.09	95.1	70 - 130
25 PFUdA			1000.00	1016.48	101.6	70 - 130
D 61 d7-MeFOSE	89085	75784			85.1	50 - 150
32 MeFOSE			1000.00	1018.93	101.9	70 - 130
D 57 d3-MeFOSA	50589	48239			95.4	50 - 150
26 MeFOSA			1000.00	980.85	98.1	70 - 130
31 11Cl-PF3OUDS			942.00	884.58	93.9	70 - 130
D 62 d9-EtFOSE	90529	86411			95.5	50 - 150
33 EtFOSE			1000.00	1220.99	122.1	70 - 130
D 59 d5-EtFOSA	43442	47186			108.6	50 - 150
27 EtFOSA			1000.00	886.75	88.7	70 - 130
11 PFDoA			1000.00	1031.21	103.1	70 - 130
D 38 13C2_PFDoA	595792	564359			94.7	50 - 150
4 10:2 FTS			964.00	845.31	87.7	70 - 130
34 PFDOS			968.00	983.01	101.6	70 - 130
24 PFTrDA			1000.00	1041.09	104.1	70 - 130
23 PFTeDA			1000.00	988.45	98.8	70 - 130
D 42 13C2_PFTeDA	902749	871737			96.6	50 - 150
35 PFHxDA			1000.00	1002.45	100.2	70 - 130
D 40 13C2_PFHxDA	845704	819055			96.8	50 - 150
36 PFODA			1000.00	978.65	97.9	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\073121-DOD.b\073121007.d		
Injection Date:	31-Jul-2021 13:04:55	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.699	1	609606	21	>100:1			1001.00	1105.57	96.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.705		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.067	1	568132	16	>100:1			1001.00	1100.31	97.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.067		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	1	171331	15	>100:1			1001.00	987.12	94.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.120		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.451		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.389	2.380	1	107904	18	>100:1			5005.00	5412.56	98.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.380		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.425	2.425	1	627508	17	>100:1			1001.00	1040.53	93.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.425		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.541	2.541	1	1220739	17	>100:1			5005.00	5731.95	96.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.541		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.791	2.791	1	535330	18	>100:1			1001.00	1103.81	98.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.800		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.809	2.809	1	152660	17	>100:1			1001.00	1099.21	103.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.800		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.827		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.174		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.140	3.148	0	96584	20	>100:1			5005.00	6158.61	103.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.141		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.167	3.168	0	527786	21	>100:1			1001.00	1066.75	103.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.168		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.545	0	139733	19	>100:1			1001.00	1003.29	94.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.545		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.754		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.880		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.197		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.357		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.701		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.544	3.553	0	649103	19	>100:1			1001.00	1065.51	102.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.553		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.836	3.839	0	284462	17	>100:1			1001.00	1065.48	99.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.839		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.893	3.888	1	111770	17				5005.00	6603.41	103	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.896		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.500		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.893	3.896	0	588720	17	>100:1			1001.00	998.07	95.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.896		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.050	4.054	0	679044	18	>100:1			5005.00	5087.06	106.3	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.063		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.213	4.217	0	614742	16	>100:1			1001.00	935.86	91.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.206		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.213	4.217	0	603087	16	>100:1			5005.00	5247.42	101.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.217		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.274	4.278	0	87606	16	>100:1			1001.00	1166.25	96.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.288		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.294	4.288	1	50301	11	>100:1			1001.00	1022.43	92.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.298		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.437	1	90927	15	>100:1			1001.00	1161.57	95.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.446		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.461	4.464	0	49036	16	>100:1			1001.00	1180.28	94.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.473		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.487	4.491	0	614476	15	>100:1			1001.00	827.66	94.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.482		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.728		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.949	4.951	0	914972	18	>100:1			1001.00	1045.65	96	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.951		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.335	5.339	0	933402	18	>100:1			1001.00	1115.07	103.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.343	5.339	1/1	5340	16	26:1	Target = 10.45		9.5839	9.5839		
813 > 269	40	5.343	5.339		633	17	29:1	8.43 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.712		ND								
*** 37 13C2_PFDA**													
515 > 470		3.893	3.896	0	618812	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.425	2.425	1	578002	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.167	3.168	0	519387	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.699	1.699	1	527602	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.544	3.545	0	135742	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\080421-DOD.b\080421008.d		
Injection Date:	04-Aug-2021 12:49:43	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	98
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.699	1	639493	20	>100:1			1001.00	1159.77	101.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.699		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.067	0	627844	16	>100:1			1001.00	1215.96	105.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.067		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.119	2.120	0	184066	15	>100:1			1001.00	1060.49	96.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.120		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.451		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.380	1	125438	17	>100:1			5005.00	6292.08	110.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.380		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.424	2.424	0	742236	17	>100:1			1001.00	1230.77	106	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.424		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.540	2.531	1	1322093	18	>100:1			5005.00	6207.86	107.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.540		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.790	2.791	0	571229	16	>100:1			1001.00	1177.83	101.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.791		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.808	2.809	0	155142	18	>100:1			1001.00	1117.08	95.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.809		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.836		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.174		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.152	3.141	1	94946	21	>100:1			5005.00	6054.16	100.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.154		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.172	3.168	1	540327	19	>100:1			1001.00	1092.09	103.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.168		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	145214	17	>100:1			1001.00	1042.64	93.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.545		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.747		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.888		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.187		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.357		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.701		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.551	3.545	1	703671	19	>100:1			1001.00	1155.09	103	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.545		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.835	3.831	1	320765	17	>100:1			1001.00	1201.46	95.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.831		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.893	3.888	1	109620	17				5005.00	6476.39	99.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.896		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.500		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.893	3.896	0	620789	18	>100:1			1001.00	1052.44	98.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.896		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.058	4.054	1	836711	17	>100:1			5005.00	6268.23	105	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.063		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.211	4.206	1	672347	15	>100:1			1001.00	1023.55	102.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.206		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.211	4.206	1	729628	16	>100:1			5005.00	6348.44	107.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.227		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.262	4.268	0	91480	15	>100:1			1001.00	1217.82	112.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.278		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.282	4.278	1	54028	13	>100:1			1001.00	1098.18	106.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.288		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.432	4.428	1	113633	16	>100:1			1001.00	1451.64	107.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.446		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.450	4.455	0	48456	15	>100:1			1001.00	1166.32	105.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.464		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.495	4.482	1	626277	16	>100:1			1001.00	843.56	86.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.491		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.728		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.956	4.951	1	1017728	17	>100:1			1001.00	1163.09	99.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.951		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.343	5.347	0	1050225	18	>100:1			1001.00	1254.63	106.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													U
813 > 769	40		5.347		ND								
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.726		ND								
*** 37 13C2_PFDA**													
515 > 470		3.901	3.896	1	646233	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.424	2.424	0	649803	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.172	3.168	1	561876	19	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.704	1.699	1	553737	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	146729	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Extract Dilution Preparations

537	**1X**	**5X**	**10X**	**20X**	**50X**	**100X**	**200X**	**500X**	**1000X**	**2000X**
EXTRACT (uL)	950	200	100	50	20	10	20	8	4	2
IS (uL)	50	40	45	47.5	49	49.5	199	199.6	199.8	199.9
96% MeOH (uL)	-	760	855	902.5	931	940.5	3781	3792.4	3796.2	3798.1
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/Vol	1/(Vol*0.2)	1/(Vol*0.1)	1/(Vol*0.05)	1/(Vol*0.02)	1/(Vol*0.01)	1/(Vol*0.005)	1/(Vol*0.002)	1/(Vol*0.001)	1/(Vol*0.0005)
ID Aq	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	(1/0.91)* (FV/V_o)	5* (FV/V_o)	10* (FV/V_o)	20* (FV/V_o)	50* (FV/V_o)	100* (FV/V_o)	200* (FV/V_o)	500* (FV/V_o)	1000* (FV/V_o)	2000* (FV/V_o)
DAI	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
SAMPLE (uL)	700	140	70	35	14	7	14	5.6	2.8	1.4
SUR (uL)	25	25	25	25	25	25	100	100	100	100
MeOH (uL)	275	275	275	275	275	275	1100	1100	1100	1100
Water (uL)	0	560	630	665	686	693	2786	2794.4	2797.2	2798.6
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/.7	1/.14	1/.07	1/.035	1/.014	1/.007	4/.014	4/.0056	4/.0028	4/.0014
ID Solid	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	((V_E/(M*S))/ 0.91)/1000	((V_E/(M*S))/ 0.2)/1000	((V_E/(M*S))/ 0.1)/1000	((V_E/(M*S))/ 0.05)/1000	((V_E/(M*S))/ 0.02)/1000	((V_E/(M*S))/ 0.01)/1000	((V_E/(M*S))/ 0.005)/1000	((V_E/ (M*S))/ 0.002)/1000	((V_E/ (M*S))/ 0.001)/1000	((V_E/ (M*S))/ 0.0005)/1000

NOTE: Dilutions of 100x or below will be prepped in 1-mL FV; dilutions higher than 100x and will be prepped in 4-mL FV.

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47	072221B017.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24	072221B018.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59	072221B019.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35	072221B020.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15	072221B021.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49	072221B022.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27	072221B023.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08	072221B024.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44	072221B025.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22	072221B026.d	ICal					Analytes	L-10	1.00		
11	ID IBLK A	23-Jul-2021 01:04:03	072221B027.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1577	23-Jul-2021 01:14:35	072221B028.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK STD_SVLC-1562	23-Jul-2021 01:25:08	072221B029.d	CheckStd					IsomerCheck	Smp	1.00		

Report Date: 03-Aug-2021 19:54:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\073121-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	31-Jul-2021 12:43:44	073121005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	31-Jul-2021 12:54:21	073121006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	31-Jul-2021 13:04:55	073121007.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ10645-001	31-Jul-2021 13:15:31	073121008.d	MBlk		Soil	1	10645	Surrogates	Smp	0.1100		
2	WQ10645-002	31-Jul-2021 13:26:10	073121009.d	LCS		Soil	1	10645	Analytes	100x PDS	0.1000		
3	WQ10559-001	31-Jul-2021 13:36:46	073121010.d	MBlk		Aqueous	1	10559	Surrogates	Smp	0.1100		MB contaminated with 6:2-FTS
4	WQ10559-002	31-Jul-2021 13:47:25	073121011.d	LCS		Aqueous	1	10559	Analytes	100x PDS	0.2000		6:2(567.9%),rx/ncm affected samples
5	WG30006-001	31-Jul-2021 13:58:05	073121012.d	Client	AFFF21-SB03-00-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
6	WG30006-002	31-Jul-2021 14:08:44	073121013.d	Client	AFFF21-SB03-06-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
7	WG30006-003	31-Jul-2021 14:19:22	073121014.d	Client	AFFF21-SB03-06-072921-01	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
8	WG30006-004	31-Jul-2021 14:30:04	073121015.d	Client	AFFF21-SB03-12-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
9	WG30006-005	31-Jul-2021 14:40:42	073121016.d	Client	AFFF21-SB03-18-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
10	WG30006-006	31-Jul-2021 14:51:21	073121017.d	Client	AFFF21-SB03-24-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
11	WG30006-007	31-Jul-2021 15:02:02	073121018.d	Client	AFFF21-SB03-28-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
12	WG30006-008	31-Jul-2021 15:12:35	073121019.d	Client	AFFF21-GW03-23-072921-00	Aqueous	50	10648	Surrogates	Smp	0.1100		RR-1X
13	WG30006-009	31-Jul-2021 15:23:09	073121020.d	Client	AFFF21-GW03-15-072921-00	Aqueous	50	10648	Surrogates	Smp	0.1100		RR-10X
14	WG29007-003	31-Jul-2021 15:33:43	073121021.d	Client	AFFF21-SB13-12-0728210-0	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
15	ID CCV 1000_SVLC-1573	31-Jul-2021 15:44:21	073121022.d	CCV					Analytes	L-5	1.00		
16	CCB 1	31-Jul-2021 15:55:04	073121023.d	InstBlk					Surrogates	Smp	0.1100		
17	WQ10561-001	31-Jul-2021 16:05:40	073121024.d	MBlk		Soil	1	10561	Surrogates	Smp	0.1100		
18	WQ10561-002	31-Jul-2021 16:16:20	073121025.d	LCS		Soil	1	10561	Analytes	100x PDS	0.1000		
19	WQ10648-001	31-Jul-2021 16:26:57	073121026.d	MBlk		Aqueous	1	10648	Surrogates	Smp	0.1100		6:2-FTS (119.39ng/L), NCM/RX affected samples
20	WQ10648-002	31-Jul-2021 16:37:38	073121027.d	LCS		Aqueous	1	10648	Analytes	100x PDS	0.2000		6:2(148.5%),RX/NCM affected samples
21	WG29007-001	31-Jul-2021 16:48:21	073121028.d	Client	AFFF21-SB13-00-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
22	WG29007-002	31-Jul-2021 16:58:59	073121029.d	Client	AFFF21-SB13-06-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
23	WG29007-004	31-Jul-2021 17:09:34	073121030.d	Client	AFFF21-SB13-18-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
24	WG29007-005	31-Jul-2021 17:20:14	073121031.d	Client	AFFF21-SB13-30-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
25	WG29007-007	31-Jul-2021 17:30:51	073121032.d	Client	AFFF21-SB15-06-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
26	WG29007-009	31-Jul-2021 17:41:26	073121033.d	Client	AFFF21-SB15-30-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
27	WG29007-011	31-Jul-2021 17:52:04	073121034.d	Client	AFFF21-SB01-00-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		RX, SUR: MeFOSAA(LOW),EtFOSAA(LOW)
28	WG29007-012	31-Jul-2021 18:02:47	073121035.d	Client	AFFF21-SB01-09-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		
29	WG29007-013	31-Jul-2021 18:13:24	073121036.d	Client	AFFF21-SB01-09-072821-01	Soil	1	10498	Surrogates	Smp	0.1100		
30	WG22019-003	31-Jul-2021 18:24:03	073121037.d	Client	RRAD-FFTA-02-SE-072021	Soil	10	10065	Surrogates	Smp	0.1100		
31	ID CCV 1000A_SVLC-1573	31-Jul-2021 18:34:45	073121038.d	CCV					Analytes	L-5	1.00		
32	CCB 2	31-Jul-2021 18:45:20	073121039.d	InstBlk					Surrogates	Smp	0.1100		
33	WQ10417-001	31-Jul-2021 18:55:55	073121040.d	MBlk		Aqueous	1	10417	Surrogates	Smp	0.1100		
34	WQ10417-002	31-Jul-2021 19:06:31	073121041.d	LCS		Aqueous	1	10417	Analytes	100x PDS	0.2000		
35	WG22086-005	31-Jul-2021 19:17:10	073121042.d	Client	DPG-PF-01-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
36	WG22086-014	31-Jul-2021 19:27:49	073121043.d	Client	DPG-FD-04-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
37	WG29007-006	31-Jul-2021 19:38:25	073121044.d	Client	AFFF21-SB15-00-0728210-0	Soil	5	10498	Surrogates	Smp	0.1100		
38	WG29007-008	31-Jul-2021 19:49:05	073121045.d	Client	AFFF21-SB15-12-0728210-0	Soil	5	10498	Surrogates	Smp	0.1100		
39	WG24009-001	31-Jul-2021 19:59:43	073121046.d	Client	AOPC22-10J02A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		
40	WG24009-002	31-Jul-2021 20:10:23	073121047.d	Client	AOPC22-10J02A-072221-FD	Aqueous	1	10417	Surrogates	Smp	0.1100		
41	WG24009-003	31-Jul-2021 20:21:03	073121048.d	Client	AOPC5-14D28A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-20X

Report Date: 03-Aug-2021 19:54:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\073121-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
42	WG24009-004	31-Jul-2021 20:31:40	073121049.d	Client	AOPC5-14D36A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-100X, SUR: PFOS(low),PFNA(low)
43	WG24009-005	31-Jul-2021 20:42:20	073121050.d	Client	AOPC22-10J01A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X
44	WG24009-006	31-Jul-2021 20:53:01	073121051.d	Client	AOPC6-14D02A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-100X
45	ID CCV 1000B_SVLC-1573	31-Jul-2021 21:03:38	073121052.d	CCV					Analytes	L-5	1.00		
46	CCB 3	31-Jul-2021 21:14:16	073121053.d	InstBlk					Surrogates	Smp	0.1100		
47	WG30006-001	31-Jul-2021 21:24:57	073121054.d	Client	AFFF21-SB03-00-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
48	WG30006-002	31-Jul-2021 21:35:37	073121055.d	Client	AFFF21-SB03-06-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
49	WG30006-003	31-Jul-2021 21:46:15	073121056.d	Client	AFFF21-SB03-06-072921-01	Soil	1	10645	Surrogates	Smp	0.1100		
50	WG30006-004	31-Jul-2021 21:56:55	073121057.d	Client	AFFF21-SB03-12-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
51	WG30006-005	31-Jul-2021 22:07:35	073121058.d	Client	AFFF21-SB03-18-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
52	WG30006-006	31-Jul-2021 22:18:09	073121059.d	Client	AFFF21-SB03-24-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
53	WG30006-007	31-Jul-2021 22:28:44	073121060.d	Client	AFFF21-SB03-28-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
54	WG30006-008	31-Jul-2021 22:39:20	073121061.d	Client	AFFF21-GW03-23-072921-00	Aqueous	1	10648	Surrogates	Smp	0.1100		SUR: MFOSA(low),TeDA(low),CENTRIFUGED,NCM
55	WG30006-009	31-Jul-2021 22:49:59	073121062.d	Client	AFFF21-GW03-15-072921-00	Aqueous	1	10648	Surrogates	Smp	0.1100		mis-prep, rr-10X
56	WG29007-003	31-Jul-2021 23:00:44	073121063.d	Client	AFFF21-SB13-12-0728210-0	Soil	1	10645	Surrogates	Smp	0.1100		reanalyzed with MS/MSD, not reported
57	ID CCV 1000C_SVLC-1573	31-Jul-2021 23:11:23	073121064.d	CCV					Analytes	L-5	1.00		
58	CCB 4	31-Jul-2021 23:22:02	073121065.d	InstBlk					Surrogates	Smp	0.1100		
59	WG29009-004	31-Jul-2021 23:32:42	073121066.d	Client	AFFF01-FRB-072821-01-T2	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS contamination, rx
60	WG29009-008	31-Jul-2021 23:43:21	073121067.d	Client	AFFF01-FRB-072821-01-T1	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
61	WG29009-009	31-Jul-2021 23:54:01	073121068.d	Client	AFFF01-RB-072821-01-T1	Aqueous	1	10648	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
62	WG29007-010	01-Aug-2021 00:04:43	073121069.d	Client	AFFF21-FRB-01-072821-03-	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
63	WG29007-018	01-Aug-2021 00:15:21	073121070.d	Client	AFFF21-FRB-02-072821-T4	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
64	WG29007-019	01-Aug-2021 00:26:04	073121071.d	Client	AFFF21-RB-01-072821-T4	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
65	ID CCV 1000D_SVLC-1573	01-Aug-2021 00:36:49	073121072.d	CCV					Analytes	L-5	1.00		

Report Date: 09-Aug-2021 19:40:13 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\organics\LL\LCMSMS02.i\080421-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	04-Aug-2021 12:17:56	080421005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	04-Aug-2021 12:28:33	080421006.d	CCV					Analytes	L-3	1.00		
98	ID IBLK A	04-Aug-2021 12:49:43	080421008.d	InstBlk					Surrogates	Smp	0.1100		
2	WQ10851-002	04-Aug-2021 13:11:01	080421010.d	LCS		Aqueous	1		Analytes	100x PDS	0.2000		
3	WQ10972-001	04-Aug-2021 13:21:34	080421011.d	MBlk		Aqueous	1	10972	Surrogates	Smp	0.1100		ADONA @ 1.79; 6:2 @ 3.95ng/L
4	WQ10972-002	04-Aug-2021 13:32:15	080421012.d	LCS		Aqueous	1	10972	Analytes	100x PDS	0.2000		ADONA/6:2 HIGH - MANIFOLD CONT?
5	WQ10799-001	04-Aug-2021 13:42:50	080421013.d	MBlk		Aqueous	1	10799	Surrogates	Smp	0.1100		
6	WQ10799-004	04-Aug-2021 13:53:25	080421014.d	MBlk		Aqueous	1	10799	Surrogates	Smp	0.1100		
7	WQ10799-002	04-Aug-2021 14:04:02	080421015.d	LCS		Aqueous	1	10799	Surrogates	Smp	0.1100		
8	WQ10799-003	04-Aug-2021 14:14:45	080421016.d	LCSD		Aqueous	1	10799	Surrogates	Smp	0.1100		
9	WQ10799-104	04-Aug-2021 14:25:23	080421017.d	LCS		Aqueous	1	10799	Analytes	100x PDS	0.2000		
10	WG20004-014	04-Aug-2021 14:36:01	080421018.d	Client	AOPC3-W7-9-071421	Aqueous	1	10799	Surrogates	Smp	0.1100		
11	WG31020-010	04-Aug-2021 14:46:43	080421019.d	Client	AFFF01-FRB-02-073021-T1	Aqueous	1	10799	Surrogates	Smp	0.1100		
12	WG31020-015	04-Aug-2021 14:57:18	080421020.d	Client	AFFF01-FRB-01-073021-T2	Aqueous	1	10799	Surrogates	Smp	0.1100		
13	WG28008-006	04-Aug-2021 15:07:52	080421021.d	Client	ASTC-DECON-(072721)	Aqueous	1	10799	Surrogates	Smp	0.1100		
14	WG29004-001	04-Aug-2021 15:18:25	080421022.d	Client	FTKX-FB-1-072721	Aqueous	1	10799	Surrogates	Smp	0.1100		
15	WG29004-002	04-Aug-2021 15:29:02	080421023.d	Client	FTKX-EB-1-072721	Aqueous	1	10799	Surrogates	Smp	0.1100		
16	WG29004-007	04-Aug-2021 15:39:41	080421024.d	Client	FTKX-FD-1-SW-072721	Aqueous	1	10799	Surrogates	Smp	0.1100		sur: TeDA(low), RX
17	ID CCV 1000_SVLC-1573	04-Aug-2021 15:50:19	080421025.d	CCV					Analytes	L-5	1.00		
18	CCB 1	04-Aug-2021 16:00:58	080421026.d	InstBlk					Surrogates	Smp	0.1100		
19	WG30020-003	04-Aug-2021 16:11:34	080421027.d	Client	AFFF01-SW04-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		RR-1X(6:2)
20	WG30020-004	04-Aug-2021 16:22:16	080421028.d	Client	AFFF01-SW05-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		6:2 ND, NCM
21	WG30020-004DU	04-Aug-2021 16:32:55	080421029.d	Client		Aqueous	1	10747	Surrogates	Smp	0.1100		6:2 ND, NCM
22	WG24008-001	04-Aug-2021 16:43:33	080421030.d	Client	AOPC20-SW01-EF-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
23	WG24008-003	04-Aug-2021 16:54:08	080421031.d	Client	AOPC13-SW01-EF-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
24	WG24008-004	04-Aug-2021 17:04:46	080421032.d	Client	AOPC13-SW01-EF-072221-FD	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
25	WG24008-005	04-Aug-2021 17:15:23	080421033.d	Client	AOPC15-SW01-EF-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
26	WG24008-005MS	04-Aug-2021 17:25:58	080421034.d	MS		Aqueous	1	10417	Analytes	100x PDS	0.2000		
27	WG24008-005MD	04-Aug-2021 17:36:37	080421035.d	MSD		Aqueous	1	10417	Analytes	100x PDS	0.2000		
28	WG24009-008	04-Aug-2021 17:47:17	080421036.d	Client	FB-12-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
29	WG24009-009	04-Aug-2021 17:57:55	080421037.d	Client	AOPC17,21-EXW-4-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
30	WG24009-010	04-Aug-2021 18:08:35	080421038.d	Client	AOPC18-A-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
31	ID CCV 1000A_SVLC-1573	04-Aug-2021 18:19:17	080421039.d	CCV					Analytes	L-5	1.00		6:2(130.9%), RR/NCM affected samples
32	CCB 2	04-Aug-2021 18:29:52	080421040.d	InstBlk					Surrogates	Smp	0.1100		
33	WG24008-006	04-Aug-2021 18:40:28	080421041.d	Client	AOPC15-SW01-IN-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
34	WG24009-011	04-Aug-2021 18:51:03	080421042.d	Client	FB-13-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
35	WG30020-002	04-Aug-2021 19:01:42	080421043.d	Client	AFFF01-SW03-072921-00-T2	Aqueous	5	10747	Surrogates	Smp	0.1100		RR-1X
36	WG30020-002MS	04-Aug-2021 19:12:20	080421044.d	MS		Aqueous	5	10747	Analytes	100x PDS	0.2000		
37	WG30020-011	04-Aug-2021 19:22:57	080421045.d	Client	AFFF01-SB13-01-072921-00	Soil	5	10645	Surrogates	Smp	0.1100		RR-5X(6:2)
38	WG24009-007	04-Aug-2021 19:33:40	080421046.d	Client	AOPC1,6,7-14C60A-072221	Aqueous	10	10417	Surrogates	Smp	0.1100		RR-5X(6:2)
39	WG24009-003	04-Aug-2021 19:44:18	080421047.d	Client	AOPC5-14D28A-072221	Aqueous	20	10417	Surrogates	Smp	0.1100		RR-20X(6:2)
40	WG24008-002	04-Aug-2021 19:54:57	080421048.d	Client	AOPC13-SW01-IN-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-50x(6:2)
41	WG24009-004	04-Aug-2021 20:05:40	080421049.d	Client	AOPC5-14D36A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		RR-100X(6:2)
42	WG24009-006	04-Aug-2021 20:16:18	080421050.d	Client	AOPC6-14D02A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		RR-100X(6:2)

Report Date: 09-Aug-2021 19:40:13 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\organics\LL\LCMSMS02.i\080421-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
43	ID CCV 1000B_SVLC-1573	04-Aug-2021 20:26:55	080421051.d	CCV					Analytes	L-5	1.00		
44	CCB 3	04-Aug-2021 20:37:35	080421052.d	InstBlk					Surrogates	Smp	0.1100		
45	WQ11005-001	04-Aug-2021 20:48:12	080421053.d	MBlk		Aqueous	1	11005	Surrogates	Smp	0.1100		
46	WQ11005-002	04-Aug-2021 20:58:49	080421054.d	LCS		Aqueous	1	11005	Analytes	100x PDS	0.0200		
47	WQ11005-003	04-Aug-2021 21:09:32	080421055.d	LCSD		Aqueous	1	11005	Analytes	100x PDS	0.0200		
48	WQ11005-102	04-Aug-2021 21:20:15	080421056.d	LCS		Aqueous	1	11005	Analytes	10x PDS	0.0200		
49	WQ11005-103	04-Aug-2021 21:30:54	080421057.d	LCSD		Aqueous	1	11005	Analytes	10x PDS	0.0200		
50	WH03029-001	04-Aug-2021 21:41:33	080421058.d	Client	1-0-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		
51	WH03029-002	04-Aug-2021 21:52:14	080421059.d	Client	1-1-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		
52	WH03029-003	04-Aug-2021 22:02:49	080421060.d	Client	1-2-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		sur: BA(low),insufficient sample,NCM
53	WH03029-004	04-Aug-2021 22:13:26	080421061.d	Client	1-3-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		
54	WH03029-005	04-Aug-2021 22:24:01	080421062.d	Client	5-0-A	Aqueous	1	11005	Surrogates	Smp	0.1100		
55	WG29003-001	04-Aug-2021 22:34:45	080421063.d	Client	FTKX-FSDB-3-SO-0-2-07272	Soil	1	10498	Surrogates	Smp	0.1100		
56	WG29003-002	04-Aug-2021 22:45:24	080421064.d	Client	FTKX-FSDB-5-SO-2-3-07272	Soil	1	10498	Surrogates	Smp	0.1100		
57	WG29003-004	04-Aug-2021 22:56:04	080421065.d	Client	FTKX-SP-38-072721	Aqueous	1	10559	Surrogates	Smp	0.1100		sur: TeDA(LOW), CONFIRMED BY MS/MSD,NCM
58	WG29003-004MS	04-Aug-2021 23:06:43	080421066.d	MS		Aqueous	1	10559	Surrogates	Smp	0.1100		
59	WG29003-004MD	04-Aug-2021 23:17:22	080421067.d	MSD		Aqueous	1	10559	Surrogates	Smp	0.1100		
60	ID CCV 1000C_SVLC-1573	04-Aug-2021 23:28:01	080421068.d	CCV					Analytes	L-5	1.00		
61	WG24010-006	04-Aug-2021 23:38:41	080421069.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
62	WG24010-007	04-Aug-2021 23:49:21	080421070.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
63	WG24010-008	04-Aug-2021 23:59:59	080421071.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
64	WG24010-009	05-Aug-2021 00:10:40	080421072.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
65	WG24010-010	05-Aug-2021 00:21:18	080421073.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
66	WG23021-001	05-Aug-2021 00:31:56	080421074.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
67	WG23021-002	05-Aug-2021 00:42:35	080421075.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
68	WG23021-003	05-Aug-2021 00:53:15	080421076.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
69	WG23021-004	05-Aug-2021 01:03:55	080421077.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
70	WG23021-005	05-Aug-2021 01:14:37	080421078.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
71	WG23021-006	05-Aug-2021 01:25:19	080421079.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
72	WG23073-002	05-Aug-2021 01:35:49	080421080.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
73	WG23024-001	05-Aug-2021 01:46:19	080421081.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
74	WG24010-001	05-Aug-2021 01:56:50	080421082.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
75	WG24010-002	05-Aug-2021 02:07:33	080421083.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
76	WG22022-001	05-Aug-2021 02:18:15	080421084.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
77	WG27023-001	05-Aug-2021 02:28:56	080421085.d	Client		Aqueous	50		Surrogates	Smp	0.1100		RR-5X
78	WG24010-003	05-Aug-2021 02:39:38	080421086.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
79	WG24010-004	05-Aug-2021 02:50:17	080421087.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
80	WG24010-005	05-Aug-2021 03:01:00	080421088.d	Client		Aqueous	50		Surrogates	Smp	0.1100		

Report Date: 06-Aug-2021 18:04:57 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58	080521006.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34	080521007.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09	080521008.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48	080521009.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22	080521010.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58	080521011.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33	080521012.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14	080521013.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51	080521014.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31	080521015.d	ICal					Analytes	L-10	1.00		
11	ID IBLK A	05-Aug-2021 14:50:11	080521016.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1590	05-Aug-2021 15:00:44	080521017.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK_SVLC-1562	05-Aug-2021 15:11:18	080521018.d	CheckStd					IsomerCheck	Smp	1.00		
14	ID IBLK B	05-Aug-2021 15:21:52	080521019.d	InstBlk					Surrogates	Smp	0.1100		
15	WQ10751-001	05-Aug-2021 15:32:30	080521020.d	Client		Soil	1	10751	Surrogates	Smp	0.1100		
16	WQ10751-002	05-Aug-2021 15:43:10	080521021.d	LCS		Soil	1	10751	Analytes	100x PDS	0.1000		
17	WQ10751-003	05-Aug-2021 15:53:47	080521022.d	LCSD		Soil	1	10751	Analytes	100x PDS	0.1000		
18	WG26022-001	05-Aug-2021 16:04:23	080521023.d	Client	OK-2	Soil	1	10751	Surrogates	Smp	0.1100		RR-100X
19	WG26022-002	05-Aug-2021 16:15:00	080521024.d	Client	OK-2A	Soil	1	10751	Surrogates	Smp	0.1100		
20	WG26022-003	05-Aug-2021 16:25:41	080521025.d	Client	OK-2B	Soil	1	10751	Surrogates	Smp	0.1100		
21	WG26022-004	05-Aug-2021 16:36:20	080521026.d	Client	OK-2C	Soil	1	10751	Surrogates	Smp	0.1100		
22	WG26023-001	05-Aug-2021 16:46:57	080521027.d	Client	OK-3	Soil	1	10751	Surrogates	Smp	0.1100		RR-100X
23	WG26023-002	05-Aug-2021 16:57:33	080521028.d	Client	OK-3A	Soil	1	10751	Surrogates	Smp	0.1100		
24	WG26023-003	05-Aug-2021 17:08:12	080521029.d	Client	OK-3B	Soil	1	10751	Surrogates	Smp	0.1100		
25	WG26023-004	05-Aug-2021 17:18:48	080521030.d	Client	OK-3C	Soil	1	10751	Surrogates	Smp	0.1100		
26	WG27006-001	05-Aug-2021 17:29:25	080521031.d	Client	FP-16	Soil	1	10751	Surrogates	Smp	0.1100		RR-10X, all sur fail
27	WG27006-002	05-Aug-2021 17:40:02	080521032.d	Client	FP-16A	Soil	1	10751	Surrogates	Smp	0.1100		
28	ID CCV 1000_SVLC-1600	05-Aug-2021 17:50:44	080521033.d	CCV					Analytes	L-5	1.00		
29	CCB 1	05-Aug-2021 18:01:26	080521034.d	InstBlk					Surrogates	Smp	0.1100		
30	WG27006-003	05-Aug-2021 18:12:05	080521035.d	Client	FP-16C	Soil	1	10751	Surrogates	Smp	0.1100		SUR: DoA(low), insuff sample,NCM
31	WG27006-004	05-Aug-2021 18:22:48	080521036.d	Client	FP-16E	Soil	1	10751	Surrogates	Smp	0.1100		
32	WG30020-003	05-Aug-2021 18:33:22	080521037.d	Client	AFFF01-SW04-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		
33	WG30020-002	05-Aug-2021 18:43:57	080521038.d	Client	AFFF01-SW03-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		
34	WG30020-002MS	05-Aug-2021 18:54:33	080521039.d	MS		Aqueous	1	10747	Analytes	100x PDS	0.2000		
35	WG24008-001	05-Aug-2021 19:05:12	080521040.d	Client	AOPC20-SW01-EF-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		
36	WG24008-006	05-Aug-2021 19:15:51	080521041.d	Client	AOPC15-SW01-IN-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
37	WG24009-009	05-Aug-2021 19:26:28	080521042.d	Client	AOPC17,21-EXW-4-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
38	WG24009-010	05-Aug-2021 19:37:05	080521043.d	Client	AOPC18-A-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
39	WG30020-011	05-Aug-2021 19:47:44	080521044.d	Client	AFFF01-SB13-01-072921-00	Soil	5	10645	Surrogates	Smp	0.1100		
40	WG24009-007	05-Aug-2021 19:58:23	080521045.d	Client	AOPC1,6,7-14C60A-072221	Aqueous	5	10417	Surrogates	Smp	0.1100		
41	ID CCV 1000A_SVLC-1600	05-Aug-2021 20:09:03	080521046.d	CCV					Analytes	L-5	1.00		
42	CCB 2	05-Aug-2021 20:19:42	080521047.d	InstBlk					Surrogates	Smp	0.1100		
43	WG24008-002	05-Aug-2021 20:30:19	080521048.d	Client	AOPC13-SW01-IN-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		
44	WG24009-003	05-Aug-2021 20:41:01	080521049.d	Client	AOPC5-14D28A-072221	Aqueous	20	10417	Surrogates	Smp	0.1100		

Report Date: 06-Aug-2021 18:04:57 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
45	WG24009-004	05-Aug-2021 20:51:40	080521050.d	Client	AOPC5-14D36A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		
46	WG24009-006	05-Aug-2021 21:02:17	080521051.d	Client	AOPC6-14D02A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		
50	WG29024-001	05-Aug-2021 21:44:57	080521055.d	Client	PFAS in Soil	Soil	1	10561	Surrogates	Smp	0.1100		
58	ID CCV 1000B_SVLC-1600	05-Aug-2021 23:10:09	080521063.d	CCV					Analytes	L-5	1.00		
59	CCB 3	05-Aug-2021 23:20:49	080521064.d	InstBlk					Surrogates	Smp	0.1100		
60	WQ11064-001	05-Aug-2021 23:31:28	080521065.d	MBlk		Soil	1	11064	Surrogates	Smp	0.1100		
61	WQ11064-002	05-Aug-2021 23:42:07	080521066.d	LCS		Soil	1	11064	Analytes	100x PDS	0.1000		
64	WG29007-011	06-Aug-2021 00:14:04	080521069.d	Client	AFFF21-SB01-00-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		
65	WG31020-011	06-Aug-2021 00:24:41	080521070.d	Client	AFFF01-SB14-02-073021-00	Soil	1	11064	Surrogates	Smp	0.1100		
66	WG29007-012	06-Aug-2021 00:35:19	080521071.d	Client	AFFF21-SB01-09-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		
67	WG29007-013	06-Aug-2021 00:45:58	080521072.d	Client	AFFF21-SB01-09-072821-01	Soil	1	10498	Surrogates	Smp	0.1100		
68	WG29007-014	06-Aug-2021 00:56:43	080521073.d	Client	AFFF21-SB01-12-072821-01	Soil	1	10561	Surrogates	Smp	0.1100		
74	ID CCV 1000_SVLC-1600	06-Aug-2021 02:00:13	080521079.d	CCV					Analytes	L-5	1.00		
75	WH03021-001	06-Aug-2021 02:10:59	080521080.d	Client	AFFF01-SB23-01-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-5X
76	WH03021-001	06-Aug-2021 02:21:39	080521081.d	Client	AFFF01-SB23-01-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
77	WH03022-017	06-Aug-2021 02:32:19	080521082.d	Client	AFFF01-SB20-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
78	WH03022-027	06-Aug-2021 02:42:59	080521083.d	Client	AFFF01-SB03-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-5X
79	WH03022-028	06-Aug-2021 02:53:39	080521084.d	Client	AFFF01-SB03-05-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
80	WH03022-029	06-Aug-2021 03:04:24	080521085.d	Client	AFFF01-SB03-11-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
81	WH03022-018	06-Aug-2021 03:15:04	080521086.d	Client	AFFF01-SB20-12-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
82	WH03022-019	06-Aug-2021 03:25:38	080521087.d	Client	AFFF01-SB20-12-080221-01	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
83	WH03022-020	06-Aug-2021 03:36:09	080521088.d	Client	AFFF01-SB20-16-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
84	WH03022-021	06-Aug-2021 03:46:48	080521089.d	Client	AFFF01-SB21-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
85	WH03022-022	06-Aug-2021 03:57:20	080521090.d	Client	AFFF01-SB21-13-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
86	WH03022-023	06-Aug-2021 04:07:53	080521091.d	Client	AFFF01-SB21-24-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
87	WH03022-024	06-Aug-2021 04:18:28	080521092.d	Client	AFFF01-SB16-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
88	WH03022-025	06-Aug-2021 04:29:10	080521093.d	Client	AFFF01-SB16-10-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
89	WH03022-026	06-Aug-2021 04:39:45	080521094.d	Client	AFFF01-SB16-15-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		

Pace Environmental Services, LLC
Analyte Quantitation Report

SAMPLE CALC PFHxS REPORTED RESULT 48 NG/ L

((151337 * 1000) / 119864) / 1.070853 = 1179.03

1179.03 * 1 * 0.0408513 = 48.16 NG/L

Data File:	\\Organics\LL\LCMSMS02.i\080421-DOD.b\080421041.d		
Injection Date:	04-Aug-2021 18:40:28	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	33
Lab Sample ID:	WG24008-006	Lab Prep. Batch:	10417
Client ID:	AOPC15-SW01-IN-072321	Sample Group:	WG24008
Sample Info:	WG24008-006	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Final Conc.:	Amt * DF * CF	Matrix/Level:	Aqueous

Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0408513

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	269	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.703	1.699	1	525796	19	>100:1			1001.00	953.57	83.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.703	1.699	1/0	120506	21	73:1			237.92	9.7192		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.073	2.067	1	488308	17	>100:1			1001.00	945.71	82.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.073	2.067	1/0	237609	15	>100:1			458.96	18.749		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.125	2.120	1	148647	16	>100:1			1001.00	856.43	77.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.125	2.120	1/0	56600	17	>100:1	Target = 3.51		294.79	12.043		
298.9 > 99	44	2.125	2.120		17949	17	>100:1	3.15 (1.75-5.27)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.459	2.451	1/0	28039	14	>100:1	Target = 2.74		202.01	8.2526		
349 > 99	44	2.459	2.451		10717	14	>100:1	2.61 (1.37-4.11)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.380	1	105432	17	>100:1			5005.00	5288.56	92.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.380		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.424	1	529411	16	>100:1			1001.00	877.86	75.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.424	1/0	266004	12	>100:1	Target = 19.67		492.02	20.100		M
313 > 119	49	2.433	2.424		15271	19	>100:1	17.41 (9.83-29.50)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.540	2.531	1	1035308	16	>100:1			5005.00	4861.27	84	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.540		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.799	2.791	1	468152	16	>100:1			1001.00	965.29	83.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.799	2.791	1/0	81726	15	>100:1	Target = 3.69		155.83	6.3657		
363 > 169	47	2.799	2.791		18570	16	>100:1	4.40 (1.84-5.53)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.817	2.809	1	119864	16	>100:1			1001.00	863.06	73.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.817	2.809	1/0	151337	25	>100:1	Target = 3.05	0.23	1180.21	48.213		
399 > 99	45	2.817	2.809		48222	22	>100:1	3.13 (1.52-4.57)	0.12				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.836		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													J
449 > 80	45	3.178	3.174	1/0	4122	27	31:1	Target = 3.06		35.098	1.4338		
449 > 99	45	3.178	3.174		1662	23	12:1	2.48 (1.53-4.59)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.152	3.141	1	81457	21	>100:1			5005.00	5194.05	86.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													J
427 > 407	64	3.158	3.154	1/0	6572	14	35:1	Target = 1.82		143.17	5.8487		M
427 > 81	64	3.152	3.154		3462	27	39:1	1.89 (0.91-2.73)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.178	3.168	1	446504	20	>100:1			1001.00	902.46	85.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.178	3.168	1/0	173702	31	>100:1	Target = 2.88	0.18	410.15	16.755		
413 > 169	53	3.178	3.168		59998	33	56:1	2.89 (1.44-4.32)	0.28				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.550	3.537	1	117079	18	>100:1			1001.00	840.63	75.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.550	3.545	1/0	150476	35	>100:1	Target = 3.41	0.67	1158.66	47.333		
499 > 99	54	3.550	3.545		40767	33	>100:1	3.69 (1.70-5.12)	0.26				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.747		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.888		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.187		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.357		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.550	3.545	1	526352	18	>100:1			1001.00	864.02	77	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.545		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.842	3.831	1	265475	18	>100:1			1001.00	994.37	79	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.831		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.892	3.888	1	88536	15	>100:1			5005.00	5230.74	80.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													J
527 > 507	65	3.908	3.896	1/0	2021	16	16:1	Target = 1.96		49.725	2.0313		
527 > 81	65	3.916	3.896		1083	18	5.5:1	1.86 (0.98-2.95)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.900	3.896	1	520704	18				1001.00	882.76	82.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.896		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.056	4.054	1	633250	16	>100:1			5005.00	4744.00	79.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.063		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.219	4.206	1	523911	17				1001.00	797.58	80.1	

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **D. WILSON** **DATE:** **SEPTEMBER 13, 2021**

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

SUBJECT: **ORGANIC DATA VALIDATION – POLYFLUOROALKYL SUBSTANCES (PFAS)**
NASA-AMES
SAMPLE DELIVERY GROUP (SDG) WG24009

SAMPLES: 9/Aqueous

AOPC1,6,7-14C60A-072221	AOPC17,21-EXW-4-072321
AOPC18-A-072321	AOPC22-10J01A-072221
AOPC22-10J02A-072221	AOPC22-10J02A-072221-FD
AOPC5-14D28A-072221	AOPC5-14D36A-072221
AOPC6-14D02A-072221	

2/Field Blanks

FB-12-072221	FB-13-072321

Overview

The sample set for NASA-Ames, SDG WG24009, consisted of nine (9) aqueous samples and two(2) field blanks. All samples were analyzed for polyfluoroalkyl substances (PFAS). One (1) field duplicate pair, AOPC22-10J02A-072221 / AOPC22-10J02A-072221-FD, was associated with this SDG.

The samples were collected by Tetra Tech, Inc. on July 22 and 23, 2021 and analyzed by Pace Analytical Services. All analyses were conducted in accordance with Department of Defense ((DOD)/Department of Energy (DOE) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3, PFAS using LC/MS/MS Appendix B Table B-15 (2019). The data contained in this SDG was validated via EPA Stage 4 with regard to the following parameters:

*	• Data completeness
*	• Hold times/Sample Preservation
*	• Mass Calibration
*	• LC/MS/MS System Tuning and Performance
*	• Mass Spectral Acquisition Rate
*	• Instrument Sensitivity Check
*	• Ion Transition Check
	• Ion Ratios
	• Initial/Continuing Calibrations
	• Laboratory Instrument / Preparation / Field Blank Results
	• Extraction Internal Standard Recoveries
*	• Laboratory Control Sample Results
	• Field Duplicate Precision
*	• Compound Identification
*	• Compound Quantitation

* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, and documentation supporting these findings is presented in Appendix C.

PFAS

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

The continuing calibration verification on 08/04/2021 at 18:19 had a percent recovery for 6:2 FTS above the 130% quality control limit. Sample FB-12-072221 was affected. The nondetected result was estimated, (UJ).

Field duplicate imprecision (relative percent difference greater than the 30% quality control limit) was noted for perfluorooctanesulfonic acid (PFOS) for sample pair AOPC22-10J02A-072221 / AOPC22-10J02A-072221-FD. The detected results reported for PFOS in the sample pair were qualified as estimated (J).

The extracted internal standard recovery for 13C8-PFOS was below the quality control limits for sample AOPC5-14D36A-072221. The laboratory reanalyzed the sample at a 100X dilution. The compounds PFOS, 9Cl-PF3ONS, perfluorononanesulfonic acid (PFNS), perfluorodecanesulfonic acid (PFDS) and 11Cl-PF3OUdS were affected. No validation action was required for PFOS as the detected result was reported from the dilution. The nondetected results reported for 9Cl-PF3ONS, PFDS and 11CL-PF3OUdS in the original analysis were qualified as estimated (UJ). The detected result reported for PFNS in the original analysis was qualified as estimated biased low (J-).

The extracted internal standard recovery for 13C9-PFNA was below the quality control limits for sample AOPC5-14D36A-072221. The laboratory reanalyzed the sample at a 100X dilution. The detected result reported for perfluorononanoic acid (PFNA) in the original analysis was qualified as estimated (J-).

The ion ration for perfluorooctane sulfonamide (FOSA) was above the quality control limit for sample AOPC5-14D36A-072221. The detected result reported for FOSA in the affected sample was qualified as estimated (J).

Additional Comments

Non-detected results were reported to the limit of detection (LOD).

Instances of manual integrations were present in this data package. All manual integrations were documented by the laboratory and are noted in the raw data of the original data package.

A detected result for PFOS (1.8 ng/L) was present in field blank FB-12-072221. Samples AOPC1,6,7-14C60A-072221, AOPC22-10J01A-072221, AOPC22-10J02A-072221, AOPC22-10J02A-072221-FD, AOPC5-14D28A-072221, AOPC5-14D36A-072221 and AOPC6-14D02A-072221 were affected. No validation actions were required as all affected results were reported above the LOQ.

Sample AOPC5-14D36A-072221 had detected results above the calibration range of the instrument for 6:2 fluorotelomer sulfonate (6:2FTS), perfluorohexanesulfonic acid (PFHxS), perfluorohexanoic acid (PFHxA) and PFOS. The laboratory reanalyzed the sample on 08/04/2021 at 20:05 at a 100X dilution. The detected results for these compounds were reported from the dilution.

Sample	Compound	Dilution
AOPC1,6,7-14C60A-072221	6:2FTS	5X

The following samples were analyzed at dilutions.

	Remaining compounds	10X
AOPC5-14D28A-072221	PFHxS	20X
	PFOS	20X
AOPC6-14D02A-072221	All compounds	100X

Executive Summary

Laboratory Performance Issues: Two extracted internal standard recoveries were outside the quality control limits. One ion ratio was outside the quality control limits.

Other Factors Affecting Data Quality: Detected results below the LOQ were estimated. Field duplicate imprecision was noted for sample pair AOPC22-10J02A-072221 / AOPC22-10J02A-072221-FD.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled "Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis be QSM Table B15" (May 1, 2020). The text of this report has been formulated to address only those areas affecting data quality.



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

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

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

Data Qualifier Definitions

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

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

Appendix A

Qualified Analytical Results

Qualifier Codes:

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

PROJ_NO: 09033A	NSAMPLE	AOPC1,6,7-14C60A-072221			AOPC17,21-EXW-4-072321			AOPC18-A-072321			AOPC22-10J01A-072221		
SDG: WG24009	LAB_ID	WG24009-007			WG24009-009			WG24009-010			WG24009-005		
FRACTION: PFAS	SAMP_DATE	7/22/2021			7/23/2021			7/23/2021			7/22/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		36	U		3.9	U		3.6	U		3.8	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		36	U		3.9	U		3.6	U		3.8	U	
4:2 FLUOROTELOMER SULFONATE		36	U		3.9	U		3.6	U		3.8	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		35	J	P	6	J	P	110			3.8	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		36	U		3.9	U		3.6	U		3.8	U	
9CL-PF3ONS		36	U		3.9	U		3.6	U		3.8	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		36	U		3.9	U		3.6	U		3.8	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		36	U		3.9	U		3.6	U		3.8	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		36	U		3.9	U		3.6	U		3.8	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		140			24			25			1.5	J	P
PERFLUOROBUTANESULFONIC ACID (PFBS)		180			7.7			22			11		
PERFLUOROBUTANOIC ACID (PFBA)		49			12			82			22		
PERFLUORODECANESULFONIC ACID (PFDS)		18	U		2	U		1.8	U		1.9	U	
PERFLUORODECANOIC ACID (PFDA)		18	U		2	U		1.8	U		1.9	U	
PERFLUORODODECANOIC ACID (PFDOA)		18	U		2	U		1.8	U		1.9	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		34	J	P	2	U		5.2			1.9	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		44			2	U		52			1.9	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		970			47			220			56		
PERFLUOROHEXANOIC ACID (PFHXA)		220			2	U		180			1.9	U	
PERFLUORONONANESULFONIC ACID (PFNS)		18	U		2	U		1.8	U		1.9	U	
PERFLUORONONANOIC ACID (PFNA)		18	U		2	U		0.91	J	P	1.9	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		18	U		2	U		1.8	U		1.9	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		1000			27			150			15		
PERFLUOROPENTANESULFONIC ACID (PFPES)		190			5			23			4.6		

PROJ_NO: 09033A	NSAMPLE	AOPC22-10J02A-072221			AOPC22-10J02A-072221-FD			AOPC5-14D28A-072221			AOPC5-14D36A-072221		
SDG: WG24009	LAB_ID	WG24009-001			WG24009-002			WG24009-003			WG24009-004		
FRACTION: PFAS	SAMP_DATE	7/22/2021			7/22/2021			7/22/2021			7/22/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF				AOPC22-10J02A-072221								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.4	U		3.4	U		3.6	U		3.7	UJ	N
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.4	U		3.4	U		3.6	U		3.7	U	
4:2 FLUOROTELOMER SULFONATE		3.4	U		3.4	U		2.4	J	P	8.3		
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		79			66			230			690	J	P
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.4	U		3.4	U		6.8	J	P	28		
9CL-PF3ONS		3.4	U		3.4	U		3.6	U		3.7	UJ	N
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.4	U		3.4	U		3.6	U		3.7	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.4	U		3.4	U		3.6	U		3.7	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.4	U		3.4	U		3.6	U		3.7	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.9	J	P	2.2	J	P	77			380		
PERFLUOROBUTANESULFONIC ACID (PFBS)		7.9			7.6			69			320		
PERFLUOROBUTANOIC ACID (PFBA)		3.5			3.4			47			170		
PERFLUORODECANESULFONIC ACID (PFDS)		1.7	U		1.7	U		1.8	U		1.9	UJ	N
PERFLUORODECANOIC ACID (PFDA)		1.7	U		1.7	U		1.8	U		1.1	J	P
PERFLUORODODECANOIC ACID (PFDOA)		1.7	U		1.7	U		1.8	U		1.9	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.7	U		1.7	U		80			530		
PERFLUOROHEPTANOIC ACID (PFHPA)		1.7	U		1.7	U		24			89		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		38			39			780			3000		
PERFLUOROHEXANOIC ACID (PFHXA)		1.7	U		1.7	U		220			930		
PERFLUORONONANESULFONIC ACID (PFNS)		1.7	U		1.7	U		1.4	J	P	7.9	J-	N
PERFLUORONONANOIC ACID (PFNA)		1.7	U		1.7	U		2.4	J	P	3.8	J-	N
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.7	U		1.7	U		2.3	J	P	4.3	J	Q
PERFLUOROOCTANESULFONIC ACID (PFOS)		15	J	G	22	J	G	5400			23000		
PERFLUOROPENTANESULFONIC ACID (PFPES)		4.4			4.6			72			340		

PROJ_NO: 09033A	NSAMPLE	AOPC6-14D02A-072221			FB-12-072221			FB-13-072321		
SDG: WG24009	LAB_ID	WG24009-006			WG24009-008			WG24009-011		
FRACTION: PFAS	SAMP_DATE	7/22/2021			7/22/2021			7/23/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		370	U		3.6	U		3.6	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		370	U		3.6	U		3.6	U	
4:2 FLUOROTELOMER SULFONATE		370	U		3.6	U		3.6	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		680	J	P	3.6	UJ	C	3.6	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		370	U		3.6	U		3.6	U	
9CL-PF3ONS		370	U		3.6	U		3.6	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		370	U		3.6	U		3.6	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		370	U		3.6	U		3.6	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		370	U		3.6	U		3.6	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		610			1.8	U		1.8	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		620			1.8	U		1.8	U	
PERFLUOROBUTANOIC ACID (PFBA)		350	J	P	1.8	U		1.8	U	
PERFLUORODECANESULFONIC ACID (PFDS)		180	U		1.8	U		1.8	U	
PERFLUORODECANOIC ACID (PFDA)		180	U		1.8	U		1.8	U	
PERFLUORODODECANOIC ACID (PFDOA)		180	U		1.8	U		1.8	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		500			1.8	U		1.8	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		230	J	P	1.8	U		1.8	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		5200			1.8	U		1.8	U	
PERFLUOROHEXANOIC ACID (PFHXA)		1700			1.8	U		1.8	U	
PERFLUORONONANESULFONIC ACID (PFNS)		180	U		1.8	U		1.8	U	
PERFLUORONONANOIC ACID (PFNA)		180	U		1.8	U		1.8	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		180	U		1.8	U		1.8	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		15000			1.8	J	P	1.8	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		590			1.8	U		1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC1,6,7-14C60A-072221			AOPC17,21-EXW-4-072321			AOPC18-A-072321			AOPC22-10J01A-072221		
SDG: WG24009	LAB_ID	WG24009-007			WG24009-009			WG24009-010			WG24009-005		
FRACTION: PFAS	SAMP_DATE	7/22/2021			7/23/2021			7/23/2021			7/22/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		56			2	U		190			1.9	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		18	U		2	U		1.8	U		1.9	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		18	U		2	U		1.8	U		1.9	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		18	U		2	U		1.8	U		1.9	U	

PROJ_NO: 09033A	NSAMPLE	AOPC22-10J02A-072221			AOPC22-10J02A-072221-FD			AOPC5-14D28A-072221			AOPC5-14D36A-072221		
SDG: WG24009	LAB_ID	WG24009-001			WG24009-002			WG24009-003			WG24009-004		
FRACTION: PFAS	SAMP_DATE	7/22/2021			7/22/2021			7/22/2021			7/22/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF				AOPC22-10J02A-072221								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.7	U		1.7	U		70			250		
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.7	U		1.7	U		1.8	U		1.9	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.7	U		1.7	U		1.8	U		1.9	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.7	U		1.7	U		1.8	U		1.9	U	

PROJ_NO: 09033A	NSAMPLE	AOPC6-14D02A-072221			FB-12-072221			FB-13-072321		
SDG: WG24009	LAB_ID	WG24009-006			WG24009-008			WG24009-011		
FRACTION: PFAS	SAMP_DATE	7/22/2021			7/22/2021			7/23/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		510			1.8	U		1.8	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		180	U		1.8	U		1.8	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		180	U		1.8	U		1.8	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		180	U		1.8	U		1.8	U	

Appendix B

Results as Reported by the Laboratory

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-001
Description: AOPC22-10J02A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 1959	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	79		6.7	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.9		3.4	1.7	0.84	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.4		3.4	1.7	0.84	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	38		3.4	1.7	0.84	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.5		3.4	1.7	0.84	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	J	3.4	1.7	0.84	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	15		3.4	1.7	0.84	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		96	50-150
13C2_6:2FTS		96	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		64	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		79	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		76	50-150
13C7_PFUdA		79	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG24009-001
Description: AOPC22-10J02A-072221			Matrix: Aqueous
Date Sampled: 07/22/2021 1210		Project Name: NASA ARC PFAS	
Date Received: 07/24/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		74	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-002
Description: AOPC22-10J02A-072221-FD
Matrix: Aqueous
Date Sampled: 07/22/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2010	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	66		6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.6		3.4	1.7	0.85	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.6		3.4	1.7	0.85	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	39		3.4	1.7	0.85	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.4		3.4	1.7	0.85	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.2	J	3.4	1.7	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	22		3.4	1.7	0.85	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		103	50-150
13C2_6:2FTS		95	50-150
13C2_8:2FTS		99	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		72	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		83	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		84	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-002
Description: AOPC22-10J02A-072221-FD
Matrix: Aqueous
Date Sampled: 07/22/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-003
Description: AOPC5-14D28A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1220
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2021	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	20	08/04/2021 1944	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	6.8	J	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	230		7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	2.4	J	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	69		3.6	1.8	0.89	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	80		3.6	1.8	0.89	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.4	J	3.6	1.8	0.89	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.3	J	3.6	1.8	0.89	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	72		3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	780		71	36	18	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	47		3.6	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	24		3.6	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	220		3.6	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.4	J	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	77		3.6	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	70		3.6	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5400		71	36	18	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		87	50-150		113	50-150
13C2_6:2FTS		91	50-150		112	50-150
13C2_8:2FTS		80	50-150		104	50-150
13C2_PFDoA		78	50-150		90	50-150
13C2_PFTeDA		76	50-150		99	50-150
13C3_PFBS		78	50-150		101	50-150
13C3_PFHxS		76	50-150		98	50-150
13C3-HFPO-DA		80	50-150		108	50-150
13C4_PFBA		80	50-150		102	50-150
13C4_PFHpA		76	50-150		102	50-150
13C5_PFHxA		78	50-150		100	50-150
13C5_PFPeA		82	50-150		102	50-150
13C6_PFDA		77	50-150		105	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-003
Description: AOPC5-14D28A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1220
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		76	50-150		108	50-150
13C8_PFOA		87	50-150		105	50-150
13C8_PFOS		66	50-150		103	50-150
13C8_PFOSA		85	50-150		103	50-150
13C9_PFNA		66	50-150		100	50-150
d5-EtFOSAA		81	50-150		114	50-150
d3-MeFOSAA		82	50-150		103	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2031	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/04/2021 2005	JJG	07/29/2021 1048	10417
3	SOP SPE	PFAS by ID SOP QSM B-15	100	08/05/2021 2051	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	28		7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	860	E	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	8.3		7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	320		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	UQ	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	530		3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	7.9	Q	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	4.3		3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	340		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4200	E	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	170		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.1	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	89		3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	980	E	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	3.8	Q	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	380		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	250		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	33000	EQ	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits	Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		87	50-150		107	50-150		127	50-150
13C2_6:2FTS		78	50-150		122	50-150		121	50-150
13C2_8:2FTS		91	50-150		103	50-150		137	50-150
13C2_PFDoA		75	50-150		97	50-150		117	50-150
13C2_PFTeDA		75	50-150		100	50-150		113	50-150
13C3_PFBS		81	50-150		98	50-150		105	50-150
13C3_PFHxS		58	50-150		101	50-150		110	50-150
13C3-HFPO-DA		84	50-150		106	50-150		121	50-150
13C4_PFBA		79	50-150		103	50-150		114	50-150
13C4_PFHpA		70	50-150		101	50-150		115	50-150
13C5_PFHxA		72	50-150		96	50-150		114	50-150
13C5_PFPeA		80	50-150		101	50-150		120	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		81	50-150		100	50-150		114	50-150
13C7_PFUdA		75	50-150		112	50-150		113	50-150
13C8_PFOA		78	50-150		106	50-150		121	50-150
13C8_PFOS	N	42	50-150		104	50-150		120	50-150
13C8_PFOSA		91	50-150		106	50-150		132	50-150
13C9_PFNA	N	44	50-150		97	50-150		112	50-150
d5-EtFOSAA		84	50-150		113	50-150		133	50-150
d3-MeFOSAA		85	50-150		103	50-150		135	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2031	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/04/2021 2005	JJG	07/29/2021 1048	10417
3	SOP SPE	PFAS by ID SOP QSM B-15	100	08/05/2021 2051	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	370	U	730	370	180	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	370	U	730	370	180	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	690	J	730	370	180	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	370	U	730	370	180	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	370	U	730	370	180	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	370	U	730	370	180	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	300	J	370	190	92	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	420		370	190	92	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	290	J	370	190	92	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3000		370	190	92	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	150	J	370	190	92	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	930		370	190	92	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	370		370	190	92	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	230	J	370	190	92	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	190	U	370	190	92	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	23000		370	190	92	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		87	50-150		107	50-150		127	50-150
13C2_6:2FTS		78	50-150		122	50-150		121	50-150
13C2_8:2FTS		91	50-150		103	50-150		137	50-150
13C2_PFDoA		75	50-150		97	50-150		117	50-150
13C2_PFTeDA		75	50-150		100	50-150		113	50-150
13C3_PFBS		81	50-150		98	50-150		105	50-150
13C3_PFHxS		58	50-150		101	50-150		110	50-150
13C3-HFPO-DA		84	50-150		106	50-150		121	50-150
13C4_PFBA		79	50-150		103	50-150		114	50-150
13C4_PFHpA		70	50-150		101	50-150		115	50-150
13C5_PFHxA		72	50-150		96	50-150		114	50-150
13C5_PFPeA		80	50-150		101	50-150		120	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		81	50-150		100	50-150		114	50-150
13C7_PFUdA		75	50-150		112	50-150		113	50-150
13C8_PFOA		78	50-150		106	50-150		121	50-150
13C8_PFOS	N	42	50-150		104	50-150		120	50-150
13C8_PFOSA		91	50-150		106	50-150		132	50-150
13C9_PFNA	N	44	50-150		97	50-150		112	50-150
d5-EtFOSAA		84	50-150		113	50-150		133	50-150
d3-MeFOSAA		85	50-150		103	50-150		135	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2031	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/04/2021 2005	JJG	07/29/2021 1048	10417
3	SOP SPE	PFAS by ID SOP QSM B-15	100	08/05/2021 2051	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	370	U	730	370	180	ng/L	3
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	370	U	730	370	180	ng/L	3
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	370	U	730	370	180	ng/L	3
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	940		730	370	180	ng/L	3
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	370	U	730	370	180	ng/L	3
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	370	U	730	370	180	ng/L	3
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	370	U	730	370	180	ng/L	3
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	370	U	730	370	180	ng/L	3
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	370	U	730	370	180	ng/L	3
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	300	J	370	190	92	ng/L	3
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	420		370	190	92	ng/L	3
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	320	J	370	190	92	ng/L	3
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	3300		370	190	92	ng/L	3
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	170	J	370	190	92	ng/L	3
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	950		370	190	92	ng/L	3
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	360	J	370	190	92	ng/L	3
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	240	J	370	190	92	ng/L	3
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	190	U	370	190	92	ng/L	3
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	23000		370	190	92	ng/L	3

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		87	50-150		107	50-150		127	50-150
13C2_6:2FTS		78	50-150		122	50-150		121	50-150
13C2_8:2FTS		91	50-150		103	50-150		137	50-150
13C2_PFDoA		75	50-150		97	50-150		117	50-150
13C2_PFTeDA		75	50-150		100	50-150		113	50-150
13C3_PFBS		81	50-150		98	50-150		105	50-150
13C3_PFHxS		58	50-150		101	50-150		110	50-150
13C3-HFPO-DA		84	50-150		106	50-150		121	50-150
13C4_PFBA		79	50-150		103	50-150		114	50-150
13C4_PFHpA		70	50-150		101	50-150		115	50-150
13C5_PFHxA		72	50-150		96	50-150		114	50-150
13C5_PFPeA		80	50-150		101	50-150		120	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-004
Description: AOPC5-14D36A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1345
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		81	50-150		100	50-150		114	50-150
13C7_PFUdA		75	50-150		112	50-150		113	50-150
13C8_PFOA		78	50-150		106	50-150		121	50-150
13C8_PFOS	N	42	50-150		104	50-150		120	50-150
13C8_PFOSA		91	50-150		106	50-150		132	50-150
13C9_PFNA	N	44	50-150		97	50-150		112	50-150
d5-EtFOSAA		84	50-150		113	50-150		133	50-150
d3-MeFOSAA		85	50-150		103	50-150		135	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-005
Description: AOPC22-10J01A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1350
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	07/31/2021 2042	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	11		3.7	1.9	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	4.6		3.7	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	56		3.7	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	22		3.7	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.5	J	3.7	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	15		3.7	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		88	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		78	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		71	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		77	50-150
13C4_PFBA		79	50-150
13C4_PFHpA		74	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		72	50-150
13C7_PFUdA		77	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG24009-005
Description: AOPC22-10J01A-072221			Matrix: Aqueous
Date Sampled: 07/22/2021 1350		Project Name: NASA ARC PFAS	
Date Received: 07/24/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-006
Description: AOPC6-14D02A-072221 | Matrix: Aqueous
Date Sampled: 07/22/2021 1540 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP QSM B-15	100	08/04/2021 2016	JJG	07/29/2021 1048	10417
3	SOP SPE	PFAS by ID SOP QSM B-15	100	08/05/2021 2102	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	370	U	730	370	180	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	370	U	730	370	180	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	680	J	730	370	180	ng/L	3
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	370	U	730	370	180	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	370	U	730	370	180	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	370	U	730	370	180	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	370	U	730	370	180	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	620		360	180	91	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	500		360	180	91	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	590		360	180	91	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5200		360	180	91	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	350	J	360	180	91	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	230	J	360	180	91	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1700		360	180	91	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	610		360	180	91	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	510		360	180	91	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	180	U	360	180	91	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	15000		360	180	91	ng/L	2

Surrogate	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		97	50-150		109	50-150
13C2_6:2FTS		105	50-150		112	50-150
13C2_8:2FTS		96	50-150		113	50-150
13C2_PFDoA		92	50-150		109	50-150
13C2_PFTeDA		93	50-150		107	50-150
13C3_PFBS		92	50-150		105	50-150
13C3_PFHxS		92	50-150		108	50-150
13C3-HFPO-DA		98	50-150		112	50-150
13C4_PFBA		94	50-150		106	50-150
13C4_PFHpA		94	50-150		115	50-150
13C5_PFHxA		88	50-150		115	50-150
13C5_PFPeA		94	50-150		106	50-150
13C6_PFDA		94	50-150		120	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-006
Description: AOPC6-14D02A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1540
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C7_PFUdA		111	50-150		105	50-150
13C8_PFOA		96	50-150		105	50-150
13C8_PFOS		96	50-150		112	50-150
13C8_PFOSA		98	50-150		127	50-150
13C9_PFNA		88	50-150		112	50-150
d5-EtFOSAA		102	50-150		118	50-150
d3-MeFOSAA		100	50-150		124	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-007
Description: AOPC1,6,7-14C60A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1550
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	10	08/04/2021 1933	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	5	08/05/2021 1958	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	36	U	72	36	18	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	36	U	72	36	18	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	36	U	72	36	18	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	35	J	36	18	9.1	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	36	U	72	36	18	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	36	U	72	36	18	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	36	U	72	36	18	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	36	U	72	36	18	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	36	U	72	36	18	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	180		36	18	9.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	34	J	36	18	9.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	190		36	18	9.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	970		36	18	9.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	49		36	18	9.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	44		36	18	9.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	220		36	18	9.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	140		36	18	9.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	56		36	18	9.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	18	U	36	18	9.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1000		36	18	9.1	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		113	50-150		101	50-150
13C2_6:2FTS		103	50-150		102	50-150
13C2_8:2FTS		93	50-150		118	50-150
13C2_PFDoA		97	50-150		105	50-150
13C2_PFTeDA		101	50-150		100	50-150
13C3_PFBS		103	50-150		100	50-150
13C3_PFHxS		93	50-150		99	50-150
13C3-HFPO-DA		109	50-150		104	50-150
13C4_PFBA		101	50-150		101	50-150
13C4_PFHpA		96	50-150		107	50-150
13C5_PFHxA		102	50-150		99	50-150
13C5_PFPeA		106	50-150		106	50-150
13C6_PFDA		102	50-150		109	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-007
Description: AOPC1,6,7-14C60A-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1550
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		106	50-150		95	50-150
13C8_PFOA		102	50-150		99	50-150
13C8_PFOS		103	50-150		105	50-150
13C8_PFOSA		111	50-150		106	50-150
13C9_PFNA		99	50-150		102	50-150
d5-EtFOSAA		106	50-150		105	50-150
d3-MeFOSAA		105	50-150		113	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-008
Description: FB-12-072221
Matrix: Aqueous
Date Sampled: 07/22/2021 1650
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1747	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	J	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		92	50-150
13C2_6:2FTS		106	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		80	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		84	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		81	50-150
13C7_PFUdA		89	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG24009-008
Description: FB-12-072221			Matrix: Aqueous
Date Sampled: 07/22/2021 1650		Project Name: NASA ARC PFAS	
Date Received: 07/24/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-009
Description: AOPC17,21-EXW-4-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 1300
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1757	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/05/2021 1926	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	6.0	J	7.8	3.9	2.0	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.7		3.9	2.0	0.98	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.0		3.9	2.0	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	47		3.9	2.0	0.98	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	12		3.9	2.0	0.98	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	24		3.9	2.0	0.98	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	27		3.9	2.0	0.98	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		91	50-150		105	50-150
13C2_6:2FTS		112	50-150		143	50-150
13C2_8:2FTS		86	50-150		91	50-150
13C2_PFDoA		76	50-150		99	50-150
13C2_PFTeDA		72	50-150		87	50-150
13C3_PFBS		78	50-150		83	50-150
13C3_PFHxS		76	50-150		88	50-150
13C3-HFPO-DA		89	50-150		93	50-150
13C4_PFBA		84	50-150		93	50-150
13C4_PFHpA		82	50-150		91	50-150
13C5_PFHxA		83	50-150		93	50-150
13C5_PFPeA		82	50-150		94	50-150
13C6_PFDA		76	50-150		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-009
Description: AOPC17,21-EXW-4-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 1300
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		84	50-150		84	50-150
13C8_PFOA		100	50-150		105	50-150
13C8_PFOS		79	50-150		91	50-150
13C8_PFOSA		83	50-150		103	50-150
13C9_PFNA		81	50-150		98	50-150
d5-EtFOSAA		85	50-150		98	50-150
d3-MeFOSAA		79	50-150		108	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: WG24009-010
Description: AOPC18-A-072321 | Matrix: Aqueous
Date Sampled: 07/23/2021 1325 | Project Name: NASA ARC PFAS
Date Received: 07/24/2021 | Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1808	JJG	07/29/2021 1048	10417
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/05/2021 1937	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	110		7.2	3.6	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	22		3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	5.2		3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	23		3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	220		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	82		3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	52		3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	180		3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.91	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	25		3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190		3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	150		3.6	1.8	0.90	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		90	50-150		110	50-150
13C2_6:2FTS		95	50-150		106	50-150
13C2_8:2FTS		82	50-150		92	50-150
13C2_PFDoA		68	50-150		87	50-150
13C2_PFTeDA		68	50-150		74	50-150
13C3_PFBS		75	50-150		77	50-150
13C3_PFHxS		76	50-150		85	50-150
13C3-HFPO-DA		87	50-150		96	50-150
13C4_PFBA		80	50-150		86	50-150
13C4_PFHpA		80	50-150		98	50-150
13C5_PFHxA		80	50-150		94	50-150
13C5_PFPeA		82	50-150		90	50-150
13C6_PFDA		72	50-150		92	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-010
Description: AOPC18-A-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 1325
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		72	50-150		80	50-150
13C8_PFOA		85	50-150		90	50-150
13C8_PFOS		76	50-150		83	50-150
13C8_PFOSA		75	50-150		90	50-150
13C9_PFNA		75	50-150		87	50-150
d5-EtFOSAA		79	50-150		95	50-150
d3-MeFOSAA		73	50-150		98	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG24009-011
Description: FB-13-072321
Matrix: Aqueous
Date Sampled: 07/23/2021 1500
Project Name: NASA ARC PFAS
Date Received: 07/24/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2021 1851	JJG	07/29/2021 1048	10417

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		90	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		73	50-150
13C2_PFDoA		65	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		79	50-150
13C3_PFHxS		79	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		81	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		80	50-150
13C6_PFDA		82	50-150
13C7_PFUdA		77	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG24009-011
Description: FB-13-072321			Matrix: Aqueous
Date Sampled: 07/23/2021 1500		Project Name: NASA ARC PFAS	
Date Received: 07/24/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	50-150
13C8_PFOS		75	50-150
13C8_PFOSA		74	50-150
13C9_PFNA		76	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		75	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Appendix C

Support Documentation

ANALYTE	ORIGINAL AOPC22-10J02A-072221	DUPLICATE AOPC22-10J02A-072221-FD	RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
6:2 FLUOROTELOMER SULFONATE (6:2FTS)	79	66	6.7	17.93	FALSE	TRUE	TRUE	FALSE
PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.9	2.2	3.4	14.63	FALSE	FALSE	FALSE	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	7.9	7.6	3.4	3.87	FALSE	TRUE	TRUE	FALSE
PERFLUOROBUTANOIC ACID (PFBA)	3.5	3.4	3.4	2.90	FALSE	FALSE	FALSE	FALSE
PERFLUOROHEXANESULFONIC ACID (PFHXS)	38	39	3.4	2.60	FALSE	TRUE	TRUE	FALSE
PERFLUOROOCTANESULFONIC ACID (PFOS)	15	22	3.4	37.84	TRUE	TRUE	TRUE	TRUE
PERFLUOROPENTANESULFONIC ACID (PFPES)	4.4	4.6	3.4	4.44	FALSE	FALSE	FALSE	FALSE

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122958

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / mike.dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 2
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves Ryan Melendez		WG24009
Project Name: NASA ARC PFAS			
Project No.: 103IG667601	P.O. No.		KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab G=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	8035 Kit	Rad Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC22-10J02A-072221	7/22/21	1210	G	x			2							X	
AOPC22-10J02A-072221-FD	7/22/21	1210	G	x			2							X	
AOPC5-14D28A-072221	7/22/21	1220	G	x			2							X	
AOPC5-14D36A-072221	7/22/21	1345	G	x			2							X	
AOPC22-10J01A-072221	7/22/21	1350	G	x			2							X	
AOPC6-14D02A-072221	7/22/21	1540	G	x			2							X	
AOPC1,6,7-14C60A-072221	7/22/21	1550	G	x			2							X	
FB-12-072221	7/22/21	1650	G	x			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TT [signature]	7/23/21	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/24/21	940	4. Laboratory received by: [signature]	7/24/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on Ice (Circle) Yes No Ice Pack Receipt Temp. 5.8 °C Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122468

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature] RcMel	Analysis (Attach list if more space is needed)	Page 2 of 2
City: Oakland; State: CA; Zip Code: 94612	Printed Name: Callie Neaves Ryan Melendez		WG24009
Project Name: NASA ARC PFAS			KE82
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	NaOH/Zn	Field Filtered	PFAS (QSMB-8)	Remarks / Cooler I.D.
AOPC17,21-EXW-4-072321	7/23/21	1300	G	X			2							X	
AOPC18-A-072321	7/23/21	1325	G	X			2							X	
FB-13-072321	7/23/21	1500	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	7/23/21	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fred E Y	7/24/21	940	4. Laboratory received by: [signature]	7/24/21	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on ice (Circle) Yes No Ice Pack Receipt Temp. 5.8 °C Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Sample Summary
Tetra Tech
Lot Number: WG24009
Project Name: NASA ARC PFAS
Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC22-10J02A-072221	Aqueous	07/22/2021 1210	07/24/2021
002	AOPC22-10J02A-072221-FD	Aqueous	07/22/2021 1210	07/24/2021
003	AOPC5-14D28A-072221	Aqueous	07/22/2021 1220	07/24/2021
004	AOPC5-14D36A-072221	Aqueous	07/22/2021 1345	07/24/2021
005	AOPC22-10J01A-072221	Aqueous	07/22/2021 1350	07/24/2021
006	AOPC6-14D02A-072221	Aqueous	07/22/2021 1540	07/24/2021
007	AOPC1,6,7-14C60A-072221	Aqueous	07/22/2021 1550	07/24/2021
008	FB-12-072221	Aqueous	07/22/2021 1650	07/24/2021
009	AOPC17,21-EXW-4-072321	Aqueous	07/23/2021 1300	07/24/2021
010	AOPC18-A-072321	Aqueous	07/23/2021 1325	07/24/2021
011	FB-13-072321	Aqueous	07/23/2021 1500	07/24/2021

(11 samples)

Case Narrative
Tetra Tech
Lot Number: WG24009

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

The continuing calibration verification (CCV) associated with samples WG24009-008, WG24009-011 for analytes: 6:2-FTS recovered above the upper control limit. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data has been reported.

Sample WG24009-004 had multiple surrogates recovered outside of the acceptance limits due to matrix interference. The sample was reanalyzed at a dilution, all runs have been reported.

PFAS by LC/MS/MS - MB

Sample ID: WQ10417-001
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/31/2021 1855
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/31/2021 1855

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	50-150
13C2_6:2FTS		87	50-150
13C2_8:2FTS		75	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		78	50-150
13C3_PFHxS		74	50-150
13C3-HFPO-DA		78	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ10417-001
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		73	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		80	50-150
13C8_PFOS		74	50-150
13C8_PFOSA		81	50-150
13C9_PFNA		82	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10417-002
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	99	70-150	07/31/2021 1906
11Cl-PF3OUdS	15	14		1	94	70-150	07/31/2021 1906
8:2 FTS	15	12		1	78	67-138	07/31/2021 1906
6:2 FTS	15	13		1	88	64-140	07/31/2021 1906
4:2 FTS	15	14		1	92	63-143	07/31/2021 1906
GenX	32	33		1	102	70-150	07/31/2021 1906
ADONA	15	16		1	107	70-150	07/31/2021 1906
EtFOSAA	16	17		1	104	61-135	07/31/2021 1906
MeFOSAA	16	16		1	102	65-136	07/31/2021 1906
PFBS	14	16		1	113	72-130	07/31/2021 1906
PFDS	15	14		1	92	53-142	07/31/2021 1906
PFHpS	15	16		1	102	69-134	07/31/2021 1906
PFNS	15	15		1	99	69-127	07/31/2021 1906
PFOSA	16	15		1	96	67-137	07/31/2021 1906
PFPeS	15	15		1	103	71-127	07/31/2021 1906
PFHxS	15	15		1	104	68-131	07/31/2021 1906
PFBA	16	17		1	107	73-129	07/31/2021 1906
PFDA	16	17		1	103	71-129	07/31/2021 1906
PFDoA	16	18		1	115	72-134	07/31/2021 1906
PFHpA	16	17		1	107	72-130	07/31/2021 1906
PFHxA	16	17		1	108	72-129	07/31/2021 1906
PFNA	16	18		1	111	69-130	07/31/2021 1906
PFOA	16	18		1	113	71-133	07/31/2021 1906
PFPeA	16	18		1	114	72-129	07/31/2021 1906
PFTeDA	16	17		1	105	71-132	07/31/2021 1906
PFTrDA	16	19		1	120	65-144	07/31/2021 1906
PFUdA	16	18		1	113	69-133	07/31/2021 1906
PFOS	15	14		1	96	65-140	07/31/2021 1906

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	50-150
13C2_6:2FTS		85	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		77	50-150
13C5_PFHxA		76	50-150
13C5_PFPeA		77	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ10417-002
Batch: 10417
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/29/2021 1048

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	50-150
13C7_PFUdA		74	50-150
13C8_PFOA		84	50-150
13C8_PFOS		80	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG24009

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC22-10J02A-072221	96	96	90	75	64	79	84	82	82
AOPC22-10J02A-072221-FD	103	95	99	88	72	79	83	84	82
AOPC5-14D28A-072221	87	91	80	78	76	78	76	80	80
AOPC5-14D28A-072221	113	112	104	90	99	101	98	108	102
AOPC5-14D36A-072221	87	78	91	75	75	81	58	84	79
AOPC5-14D36A-072221	107	122	103	97	100	98	101	106	103
AOPC5-14D36A-072221	127	121	137	117	113	105	110	121	114
AOPC22-10J01A-072221	88	107	78	77	71	76	80	77	79
AOPC6-14D02A-072221	97	105	96	92	93	92	92	98	94
AOPC6-14D02A-072221	109	112	113	109	107	105	108	112	106
AOPC1,6,7-14C60A-072221	113	103	93	97	101	103	93	109	101
AOPC1,6,7-14C60A-072221	101	102	118	105	100	100	99	104	101
FB-12-072221	92	106	89	77	80	84	84	97	90
AOPC17,21-EXW-4-072321	91	112	86	76	72	78	76	89	84
AOPC17,21-EXW-4-072321	105	143	91	99	87	83	88	93	93
AOPC18-A-072321	90	95	82	68	68	75	76	87	80
AOPC18-A-072321	110	106	92	87	74	77	85	96	86
FB-13-072321	90	94	73	65	70	79	79	88	82
WQ10417-001	81	87	75	71	78	78	74	78	82
WQ10417-002	81	85	86	72	74	76	82	79	78

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG24009

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC22-10J02A-072221	79	82	82	76	79	82	82	91	
AOPC22-10J02A-072221-FD	83	81	86	83	84	85	78	92	
AOPC5-14D28A-072221	76	78	82	77	76	87	66	85	
AOPC5-14D28A-072221	102	100	102	105	108	105	103	103	
AOPC5-14D36A-072221	70	72	80	81	75	78	42 *	91	
AOPC5-14D36A-072221	101	96	101	100	112	106	104	106	
AOPC5-14D36A-072221	115	114	120	114	113	121	120	132	
AOPC22-10J01A-072221	74	79	82	72	77	87	79	92	
AOPC6-14D02A-072221	94	88	94	94	111	96	96	98	
AOPC6-14D02A-072221	115	115	106	120	105	105	112	127	
AOPC1,6,7-14C60A-072221	96	102	106	102	106	102	103	111	
AOPC1,6,7-14C60A-072221	107	99	106	109	95	99	105	106	
FB-12-072221	85	87	91	81	89	95	80	82	
AOPC17,21-EXW-4-072321	82	83	82	76	84	100	79	83	
AOPC17,21-EXW-4-072321	91	93	94	91	84	105	91	103	
AOPC18-A-072321	80	80	82	72	72	85	76	75	
AOPC18-A-072321	98	94	90	92	80	90	83	90	
FB-13-072321	81	82	80	82	77	87	75	74	
WQ10417-001	76	79	85	73	77	80	74	81	
WQ10417-002	77	76	77	75	74	84	80	82	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG24009

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC22-10J02A-072221	74	103	94						0
AOPC22-10J02A-072221-FD	85	101	91						0
AOPC5-14D28A-072221	66	81	82						0
AOPC5-14D28A-072221	100	114	103						0
AOPC5-14D36A-072221	44 *	84	85						2
AOPC5-14D36A-072221	97	113	103						0
AOPC5-14D36A-072221	112	133	135						0
AOPC22-10J01A-072221	80	84	82						0
AOPC6-14D02A-072221	88	102	100						0
AOPC6-14D02A-072221	112	118	124						0
AOPC1,6,7-14C60A-072221	99	106	105						0
AOPC1,6,7-14C60A-072221	102	105	113						0
FB-12-072221	85	98	87						0
AOPC17,21-EXW-4-072321	81	85	79						0
AOPC17,21-EXW-4-072321	98	98	108						0
AOPC18-A-072321	75	79	73						0
AOPC18-A-072321	87	95	98						0
FB-13-072321	76	81	75						0
WQ10417-001	82	87	84						0
WQ10417-002	78	79	81						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

CLIENT SAMPLE ID

WQ10417-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG24009

Project No.: 103IG667601
Lab Sample ID: WQ10417-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 07/29/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 07/31/2021

Time Analyzed: 18:55

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC22-10J02A-072221	WG24009-001		19:59
AOPC22-10J02A-072221-FD	WG24009-002		20:10
AOPC5-14D28A-072221	WG24009-003		20:21
AOPC5-14D28A-072221	WG24009-003		19:44
AOPC5-14D36A-072221	WG24009-004		20:31
AOPC5-14D36A-072221	WG24009-004		20:05
AOPC5-14D36A-072221	WG24009-004		20:51
AOPC22-10J01A-072221	WG24009-005		20:42
AOPC6-14D02A-072221	WG24009-006		20:16
AOPC6-14D02A-072221	WG24009-006		21:02
AOPC1,6,7-14C60A-072221	WG24009-007		19:33
AOPC1,6,7-14C60A-072221	WG24009-007		19:58
FB-12-072221	WG24009-008		17:47
AOPC17,21-EXW-4-072321	WG24009-009		17:57
AOPC17,21-EXW-4-072321	WG24009-009		19:26
AOPC18-A-072321	WG24009-010		18:08
AOPC18-A-072321	WG24009-010		19:37
FB-13-072321	WG24009-011		18:51
WQ10417-002	WQ10417-002		19:06

Pace Environmental Services, LLC
Analyte Quantitation Report

ION RATIOS

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121049.d
Injection Date: 31-Jul-2021 20:31:40 Injection Vol: 10.0 uL
Sample Type: Client Auto Sampler: 42
Lab Sample ID: WG24009-004 Lab Prep. Batch: 10417
Client ID: AOPC5-14D36A-072221 Sample Group: WG24009
Sample Info: WG24009-004 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Final Conc.: Amt * DF * CF Matrix/Level: Aqueous
Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0402528

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	273	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.699	1	498100	19	>100:1			1001.00	903.35	79	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.705	0/-1	2051260	20	>100:1			4274.99	172.08		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.067	1	465615	15	>100:1			1001.00	901.76	80.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.067	1/0	3040168	12	>100:1			6158.50	247.90		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.120	1	145945	15	>100:1			1001.00	840.86	80.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.120	1/0	1499572	17	>100:1	Target = 3.51		7954.87	320.21		
298.9 > 99	44	2.130	2.120		476651	17	>100:1	3.14 (1.75-5.27)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.469	2.451	2/1	1162262	13	93:1	Target = 2.74		8528.87	343.31		M
349 > 99	44	2.469	2.451		360454	13	>100:1	3.22 (1.37-4.11)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.380	2	95028	15	>100:1			5005.00	4766.69	87.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.380	2/0	7947	16	36:1	Target = 1.66		207.19	8.3399		
327 > 81	63	2.398	2.380		4820	17	21:1	1.64 (0.83-2.49)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.434	2.425	1	479913	16	>100:1			1001.00	795.79	71.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.434	2.425	1/0	11964770	13	>100:1	Target = 19.67		24414	982.71		E
313 > 119	49	2.434	2.425		662905	16	>100:1	18.04 (9.83-29.50)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.549	2.541	1	1055600	16	>100:1			5005.00	4956.55	83.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.541		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.791	2	380462	16	>100:1			1001.00	784.48	70.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.800	1/-1	945666	12	31:1	Target = 3.69		2218.67	89.307		M
363 > 169	47	2.809	2.800		246919	14	23:1	3.82 (1.84-5.53)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.809	2	86112	17	>100:1			1001.00	620.04	58.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.800	2/0	9604755	25	>100:1	Target = 3.05	0.22	104262	4196.85		E
399 > 99	45	2.818	2.800		3063197	25	>100:1	3.13 (1.52-4.57)	0.14				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.827		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.193	3.174	2/0	1115955	18	>100:1	Target = 3.06		13226	532.40		M
449 > 99	45	3.193	3.174		412128	19	14:1	2.70 (1.53-4.59)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.160	3.148	1	72822	23	>100:1			5005.00	4643.44	77.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.167	3.141	2/1	875962	22	>100:1	Target = 1.82		21346	859.22		E
427 > 81	64	3.167	3.141		492588	21	>100:1	1.77 (0.91-2.73)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.187	3.168	2	396632	21	>100:1			1001.00	801.66	77.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.187	3.168	2/0	3584591	32	>100:1	Target = 2.88	0.17	9528.36	383.54		
413 > 169	53	3.187	3.168		1433126	33	>100:1	2.50 (1.44-4.32)	0.21				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.552	3.545	1	61682	22	>100:1			1001.00	442.88	41.7*	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.560	3.545	1/0	54580653	40	>100:1	Target = 3.41	0.97	809798	32597		ME
499 > 99	54	3.560	3.545		15741149	36	>100:1	3.46 (1.70-5.12)	0.36				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.754		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.894	3.880	1/0	9613	12	>100:1	Target = 2.51		195.84	7.8829		
549 > 99	54	3.885	3.880		6650	13	66:1	1.44 (1.25-3.76)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.197		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.357		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.568	3.553	1	280892	20	>100:1			1001.00	461.09	44.4*	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.568	3.553	1/0	28076	15	39:1	Target = 6.36		94.968	3.8227		M
463 > 169	56	3.552	3.553		5579	14		5.03 (3.18-9.54)					M
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.852	3.839	1	260366	17	>100:1			1001.00	975.23	90.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.852	3.839	1/0	29934	17	>100:1	Target = 28.47		107.73	4.3363		
498>478	55	3.852	3.839		385	15	6.8:1	77.75 (14.23-42.70)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.902	3.888	1	98465	17	>100:1			5005.00	5817.35	90.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.902	3.896	1/0	31187	15	>100:1	Target = 1.96		689.95	27.772		
527 > 81	65	3.910	3.896		16937	15	>100:1	1.84 (0.98-2.95)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.910	3.896	1	498536	17	>100:1			1001.00	845.18	80.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													J
513 > 469	51	3.910	3.896	1/0	14497	13	10:1	Target = 13.35		27.311	1.0993		
513 > 169	51	3.918	3.896		1089	18	5.8:1	13.31 (6.67-20.03)					

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.613	3.212	3.254	3.512	3.519	3.439	3.450	3.423	3.453	3.406	3.428	3.170-3.867	0.11611	1.759
1 4:2 FTS	0.893	1.026	1.353	1.771	1.666	1.969	1.808	1.978	1.879	1.975	1.631	0.377-2.954	0.42965	0.833
15 PFHxA	14.031	13.128	25.058	19.778	19.670	18.684	18.332	17.826	18.587	16.968	18.206	10.298-29.041	3.12369	9.835
22 PFPeS	3.236	2.899	3.017	3.131	2.741	3.011	2.863	2.861	2.937	3.054	2.975	2.313-3.168	0.14244	1.370
28 GenX	0.743	0.771	0.796	0.756	0.792	0.778	0.802	0.762	0.801	0.801	0.780	0.730-0.853	0.02047	0.396
13 PFHpA	3.729	3.626	4.038	3.688	3.691	3.699	3.761	3.747	3.689	3.615	3.728	3.329-4.052	0.12053	1.845
14 PFHxS	3.013	2.850	2.943	2.837	3.053	3.270	3.250	3.163	2.987	3.051	3.041	2.597-3.508	0.15168	1.526
29 ADONA	3.008	2.930	3.121	3.020	3.078	3.024	3.133	2.998	3.054	2.887	3.025	2.823-3.332	0.08492	1.539
2 6:2 FTS	Disabled	1.603	1.602	1.986	1.824	1.966	1.821	1.888	1.888	1.794	1.819	1.414-2.233	0.13649	0.912
20 PFOA	2.682	3.014	2.640	3.017	2.883	2.685	2.898	2.853	3.040	2.880	2.859	2.421-3.344	0.15393	1.441
12 PFHpS	2.754	3.053	3.578	3.274	3.062	3.160	3.143	2.970	3.104	2.957	3.105	2.405-3.718	0.21869	1.531
18 PFOS	3.458	3.004	3.025	3.387	3.415	3.427	3.449	3.289	3.288	3.372	3.311	2.828-4.001	0.19534	1.707
17 PFNA	7.315	6.232	6.097	6.165	6.365	6.364	6.419	6.205	6.468	6.017	6.364	5.200-7.529	0.38823	3.182
19 PFOSA	69.990	52.330	34.668	27.726	28.473	32.713	32.270	32.526	30.906	30.582	37.218	-13.074-70.020	13.84911	14.236
16 PFNS	2.370	2.991	3.315	2.530	2.513	2.612	2.708	2.741	2.805	2.756	2.734	1.730-3.295	0.26096	1.256
10 PFDA	10.069	14.382	13.280	14.604	13.356	13.003	13.142	12.930	12.566	12.724	13.005	9.699-17.012	1.21871	6.678
3 8:2 FTS	1.577	1.517	1.982	1.945	1.968	2.064	1.988	1.857	1.848	2.011	1.875	1.329-2.606	0.21297	0.984
6 N-MeFOSAA	1.729	1.368	1.209	1.297	1.452	1.386	1.421	1.374	1.370	1.373	1.397	1.020-1.883	0.14393	0.726
9 PFDS	2.989	2.117	3.337	2.261	2.618	2.535	2.720	Disabled	Disabled	Disabled	2.653	1.432-3.803	0.39506	1.309
25 PFUdA	10.186	13.794	12.360	14.609	14.700	13.886	13.538	13.848	14.326	13.899	13.514	10.475-18.924	1.40814	7.350
5 N-EtFOSAA	3.441	1.648	1.914	1.385	1.447	1.704	1.510	1.704	1.566	1.711	1.803	-0.278-3.172	0.57502	0.723
26 MeFOSA	0.872	1.060	0.983	1.222	1.013	0.982	0.996	1.118	1.006	1.027	1.027	0.729-1.296	0.09451	0.506
27 EtFOSA	0.899	1.138	0.928	0.907	0.893	1.061	0.960	0.948	1.053	0.994	0.978	0.635-1.150	0.08599	0.446
11 PFDoA	17.404	11.511	9.422	10.673	10.018	10.373	10.714	10.193	10.249	10.510	11.106	3.257-16.778	2.25341	5.009
4 10:2 FTS	3.256	1.775	3.770	3.333	3.196	3.666	3.304	3.478	3.467	3.512	3.275	1.509-4.882	0.56222	1.598
34 PFDOS	3.580	2.776	3.093	2.779	3.093	3.074	2.931	3.077	3.134	3.223	3.076	2.399-3.786	0.23104	1.546
24 PFTrDA	8.158	8.335	8.011	7.623	8.030	7.860	7.857	8.081	8.143	7.615	7.971	7.303-8.756	0.24220	4.015
23 PFTeDA	11.812	12.137	10.917	11.359	11.304	11.364	11.381	11.748	11.166	10.899	11.408	10.099-12.508	0.40138	5.652
35 PFHxDA	11.601	11.103	9.130	10.834	10.453	10.404	10.497	10.396	10.280	10.369	10.506	8.526-12.379	0.64207	5.226
36 PFODA	14.446	12.290	13.663	13.457	13.351	13.158	13.254	13.055	12.911	12.657	13.224	11.594-15.107	0.58536	6.675

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	547	611	600	573	563	559	541	472	515	533	Avg:A Wt:C2	551		RSD=7.3	
	99.2	110.8	108.8	103.9	102.1	101.4	98	85.7	93.5	96.6	Org:N Dep:R				
8 PFBA	1.016419	1.005008	0.969197	0.979269	0.877172	0.939182	0.971835	0.977893	0.961911	0.944904	Avg:A Wt:C2	0.964279		RSD=4.0	
	105.4	104.2	100.5	101.6	91	97.4	100.8	101.4	99.8	98	Org:N Dep:R				
D 50 13C5_PFPeA	511	576	552	532	524	535	519	439	481	495	Avg:A Wt:C2	516		RSD=7.4	
	99	111.5	106.8	103	101.4	103.7	100.6	85	93.2	95.8	Org:N Dep:R				
21 PFPeA	1.142375	1.109055	1.059827	1.048168	0.941090	1.070071	1.082590	1.082854	1.057405	1.019366	Avg:A Wt:C2	1.061280		RSD=5.1	
	107.6	104.5	99.9	98.8	88.7	100.8	102	102	99.6	96.1	Org:N Dep:R				
D 44 13C3_PFBS	169	196	188	179	169	176	182	140	164	172	Avg:A Wt:C2	174		RSD=8.8	
	97.1	113.1	108.2	103	97.5	101.6	105.1	80.7	94.3	99.3	Org:N Dep:R				
7 PFBS	1.381732	1.255550	1.302964	1.288405	1.228942	1.263662	1.236027	1.381835	1.313330	1.276973	Avg:A Wt:C2	1.292942		RSD=4.2	
	106.9	97.1	100.8	99.6	95.1	97.7	95.6	106.9	101.6	98.8	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 63 13C2_4:2 FTS_2	20.0656	22.1628	21.5058	21.9484	18.0392	19.9862	19.3008	17.9994	18.5994	19.7510	Avg:A Wt:C2	19.9359		RSD=7.7	
	100.7	111.2	107.9	110.1	90.5	100.3	96.8	90.3	93.3	99.1	Org:N Dep:R				
1 4:2 FTS	1.969984	2.018352	1.754668	1.950750	2.148070	2.269259	2.125729	1.914512	1.994807	2.055682	Avg:A Wt:C2	2.020181		RSD=7.0	
	97.5	99.9	86.9	96.6	106.3	112.3	105.2	94.8	98.7	101.8	Org:N Dep:R				
D 49 13C5_PFHxA	606	659	647	645	600	624	619	499	541	589	Avg:A Wt:C2	603		RSD=8.3	
	100.5	109.3	107.3	107	99.5	103.5	102.6	82.8	89.7	97.7	Org:N Dep:R				
15 PFHxA	1.136456	0.970051	1.105495	1.009838	0.939058	1.016957	0.974863	1.065629	1.065952	0.937937	Avg:A Wt:C2	1.022224		RSD=6.8	
	111.2	94.9	108.1	98.8	91.9	99.5	95.4	104.2	104.3	91.8	Org:N Dep:R				
22 PFPeS	1.040990	0.872468	0.901285	0.964537	0.925005	0.938154	0.879388	0.995855	0.895449	0.933551	Avg:A Wt:C2	0.934668		RSD=5.7	
	111.4	93.3	96.4	103.2	99	100.4	94.1	106.5	95.8	99.9	Org:N Dep:R				
28 GenX	0.694514	0.706749	0.711356	0.656646	0.698709	0.700657	0.679510	0.647892	0.680289	0.709347	Avg:A Wt:C2	0.688567		RSD=3.2	
	100.9	102.6	103.3	95.4	101.5	101.8	98.7	94.1	98.8	103	Org:N Dep:R				
D 66 13C3_GenX	212	240	236	225	200	208	215	190	206	198	Avg:A Wt:C2	213		RSD=7.7	
	99.6	112.8	110.8	105.5	94	97.4	100.7	89.4	96.8	93	Org:N Dep:R				
13 PFHpA	1.286509	1.178728	1.131168	1.130533	1.008084	1.081766	1.064985	1.080324	1.138289	1.113823	Avg:A Wt:C2	1.121421		RSD=6.7	
	114.7	105.1	100.9	100.8	89.9	96.5	95	96.3	101.5	99.3	Org:N Dep:R				
D 47 13C4_PFHpA	492	543	527	513	483	474	503	425	434	456	Avg:A Wt:C2	485		RSD=8.0	
	101.4	112	108.7	105.8	99.5	97.7	103.7	87.6	89.5	94	Org:N Dep:R				
D 45 13C3_PFHxS	146	153	151	151	138	146	142	109	122	130	Avg:A Wt:C2	139		RSD=10.4	
	105.5	110.2	108.9	108.6	99.1	105.4	102.5	78.6	87.7	93.5	Org:N Dep:R				
14 PFHxS	1.121227	1.085313	1.008377	1.043022	1.013859	1.034529	1.038313	1.150037	1.122995	1.090854	Avg:A Wt:C2	1.070853		RSD=4.7	
	104.7	101.4	94.2	97.4	94.7	96.6	97	107.4	104.9	101.9	Org:N Dep:R				
29 ADONA	6.792623	6.160722	6.316662	5.993784	5.749857	5.987295	6.069684	6.511944	6.645386	6.159051	Avg:A Wt:C2	6.238701		RSD=5.2	
	108.9	98.8	101.2	96.1	92.2	96	97.3	104.4	106.5	98.7	Org:N Dep:R				
2 6:2 FTS	Disabled	3.574242	3.490726	2.866088	2.538598	2.523102	2.760954	2.660239	2.538669	2.431365	Avg:A Wt:C2	2.820442		RSD=15.1	
	Disabled	126.7	123.8	101.6	90	89.5	97.9	94.3	90	86.2	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	16.1862	17.3062	18.3352	16.0446	15.4642	17.2064	13.8766	13.1698	14.7236	14.5148	Avg:A Wt:C2	15.6828		RSD=10.5	
	103.2	110.4	116.9	102.3	98.6	109.7	88.5	84	93.9	92.6	Org:N Dep:R				
D 53 13C8_PFOA	507	557	550	516	539	488	514	399	425	452	Avg:A Wt:C2	495		RSD=10.8	
	102.6	112.6	111.2	104.2	108.9	98.6	103.9	80.6	85.8	91.5	Org:N Dep:R				
20 PFOA	1.015673	0.954395	0.968422	0.961601	0.805359	0.967654	0.914120	0.960996	1.022079	0.924109	Avg:A Wt:C2	0.949441		RSD=6.4	
	107	100.5	102	101.3	84.8	101.9	96.3	101.2	107.7	97.3	Org:N Dep:R				
12 PFHpS	1.072621	0.975748	0.993382	0.911480	0.941168	0.969310	0.970020	1.036016	0.992607	0.945489	Avg:A Wt:C2	0.980784		RSD=4.8	
	109.4	99.5	101.3	92.9	96	98.8	98.9	105.6	101.2	96.4	Org:N Dep:R				
D 54 13C8_PFOS	137	158	156	136	140	145	139	112	132	139	Avg:A Wt:C2	139		RSD=9.3	
	98.1	113.4	112	97.7	100.5	103.9	99.5	80.1	94.7	100.1	Org:N Dep:R				
18 PFOS	1.578661	1.256972	1.000883	1.166541	1.036035	1.115945	1.144211	1.206493	1.103505	1.134872	Ln:A Wt:C2	1.093775	19.2285	R^2=0.992	
	106.4	96	82	102.9	92.8	101.1	104.2	110.1	100.8	103.7	Org:N Dep:R			RSE=8.5	
D 56 13C9_PFNA	625	675	643	627	619	632	609	526	549	585	Avg:A Wt:C2	609		RSD=7.3	
	102.7	110.9	105.5	102.9	101.6	103.8	100	86.3	90.2	96.1	Org:N Dep:R				
17 PFNA	1.211027	1.087750	1.056915	1.012170	0.943876	1.098155	1.021197	1.020035	1.056310	1.027970	Avg:A Wt:C2	1.053541		RSD=6.7	
	114.9	103.2	100.3	96.1	89.6	104.2	96.9	96.8	100.3	97.6	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.688737	3.285706	3.460432	3.845645	3.154403	3.493060	3.522847	4.062284	3.824058	3.722494	Avg:A Wt:C2	3.605967		RSD=7.6	
	102.3	91.1	96	106.6	87.5	96.9	97.7	112.7	106	103.2	Org:N Dep:R				
D 55 13C8_PFOSA	275	295	290	270	250	293	260	229	250	259	Avg:A Wt:C2	267		RSD=8.1	
	103	110.6	108.5	101	93.6	109.7	97.4	85.6	93.5	97.1	Org:N Dep:R				
19 PFOSA	1.105052	1.151548	0.991587	1.047427	1.090677	0.984879	1.000929	1.088139	1.091422	1.131345	Avg:A Wt:C2	1.068300		RSD=5.5	
	103.4	107.8	92.8	98	102.1	92.2	93.7	101.9	102.2	105.9	Org:N Dep:R				
16 PFNS	0.885752	0.729123	0.814794	0.808249	0.682093	0.784107	0.795145	0.885268	0.800149	0.781390	Avg:A Wt:C2	0.796607		RSD=7.8	
	111.2	91.5	102.3	101.5	85.6	98.4	99.8	111.1	100.4	98.1	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	17.8008	19.2204	19.3660	17.3986	14.4364	17.0066	16.8702	15.2824	16.6032	15.2764	Avg:A Wt:C2	16.9261		RSD=9.6	
	105.2	113.6	114.4	102.8	85.3	100.5	99.7	90.3	98.1	90.3	Org:N Dep:R				
10 PFDA	1.121987	1.091406	1.113959	1.087910	0.978715	1.120213	1.017481	1.097764	1.007865	1.020853	Avg:A Wt:C2	1.065815		RSD=5.0	
	105.3	102.4	104.5	102.1	91.8	105.1	95.5	103	94.6	95.8	Org:N Dep:R				
D 51 13C6_PFDA	603	658	666	609	591	587	608	491	532	555	Avg:A Wt:C2	590		RSD=9.1	
	102.3	111.5	112.9	103.3	100.1	99.4	103.1	83.2	90.2	94	Org:N Dep:R				
3 8:2 FTS	2.236535	2.068088	2.664043	2.264118	2.622474	2.487061	2.318105	2.066044	2.035501	2.214282	Avg:A Wt:C2	2.297625		RSD=9.9	
	97.3	90	115.9	98.5	114.1	108.2	100.9	89.9	88.6	96.4	Org:N Dep:R				
D 58 d3-MeFOSAA	131	136	148	123	120	139	127	123	148	141	Avg:A Wt:C2	133		RSD=7.6	
	97.8	102.1	110.6	92.2	90.2	104.2	95	92	110.6	105.3	Org:N Dep:R				
6 N-MeFOSAA	0.982031	0.877342	0.661060	0.696446	0.771956	0.772451	0.801981	0.743534	0.722426	0.784505	Avg:A Wt:C2	0.781373		RSD=11.8	
	125.7	112.3	84.6	89.1	98.8	98.9	102.6	95.2	92.5	100.4	Org:N Dep:R				
9 PFDS	1.094012	0.676181	0.766211	0.756593	0.723345	0.739213	0.781721	Disabled	Disabled	Disabled	Ln:A Wt:C	0.759859	5.436781	R^2=0.997	
	129.1	81.6	97.1	98.1	94.5	96.9	102.7	Disabled	Disabled	Disabled	Org:N Dep:R			RSE=15.8	
D 52 13C7_PFUdA	705	716	747	634	708	721	634	527	562	617	Avg:A Wt:C2	657		RSD=11.3	
	107.3	108.9	113.8	96.5	107.7	109.7	96.5	80.2	85.5	93.9	Org:N Dep:R				
D 60 d5-EtFOSAA	120	132	131	120	104	123	113	93.8996	105	107	Avg:A Wt:C2	115		RSD=10.8	
	104	115	113.8	104.8	90.7	106.8	98.7	81.7	91.5	92.8	Org:N Dep:R				
25 PFUdA	0.821472	0.962352	0.858297	0.977931	0.780823	0.847434	0.879772	0.930643	0.924546	0.862079	Avg:A Wt:C2	0.884535		RSD=7.1	
	92.9	108.8	97	110.6	88.3	95.8	99.5	105.2	104.5	97.5	Org:N Dep:R				
5 N-EtFOSAA	1.198909	0.961713	0.892920	0.867371	0.965256	1.028107	1.003115	1.013985	0.973630	1.016873	Avg:A Wt:C2	0.992188		RSD=9.1	
	120.8	96.9	90	87.4	97.3	103.6	101.1	102.2	98.1	102.5	Org:N Dep:R				
D 61 d7-MeFOSE	72.5780	83.3930	78.7110	74.4230	68.2950	72.5570	78.6500	69.2240	75.2560	78.0920	Avg:A Wt:C2	75.1179		RSD=6.2	
	96.6	111	104.8	99.1	90.9	96.6	104.7	92.2	100.2	104	Org:N Dep:R				
32 MeFOSE	1.199537	1.109925	1.261958	1.027478	1.123801	1.247495	1.098197	1.108855	1.089627	1.163942	Avg:A Wt:C2	1.143082		RSD=6.5	
	104.9	97.1	110.4	89.9	98.3	109.1	96.1	97	95.3	101.8	Org:N Dep:R				
D 57 d3-MeFOSA	45.9100	50.8680	49.2480	47.4650	40.7770	50.6270	47.8650	48.3890	57.2100	53.6180	Avg:A Wt:C2	49.1977		RSD=9.0	
	93.3	103.4	100.1	96.5	82.9	102.9	97.3	98.4	116.3	109	Org:N Dep:R				
26 MeFOSA	0.715313	0.916097	1.160453	1.107427	1.070285	1.011565	1.028426	0.962248	0.886511	0.982414	Avg:A Wt:C2	0.984074		RSD=12.8	
	72.7	93.1	117.9	112.5	108.8	102.8	104.5	97.8	90.1	99.8	Org:N Dep:R				
31 11Cl-PF3OUDS	3.404397	3.058323	3.010505	3.467293	3.029313	3.086520	3.133430	3.605481	3.180048	3.207502	Avg:A Wt:C2	3.218281		RSD=6.4	
	105.8	95	93.5	107.7	94.1	95.9	97.4	112	98.8	99.7	Org:N Dep:R				
D 62 d9-EtFOSE	83.2060	83.3240	80.1150	80.0420	68.4520	79.8740	80.7840	71.5570	74.6630	80.7740	Avg:A Wt:C2	78.2791		RSD=6.4	
	106.3	106.4	102.3	102.3	87.4	102	103.2	91.4	95.4	103.2	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	1.277071	1.196774	1.459964	1.175608	1.200359	1.117648	1.066810	1.096601	1.155936	1.168089	Avg:A Wt:C2	1.191486		RSD=9.3	
	107.2	100.4	122.5	98.7	100.7	93.8	89.5	92	97	98	Org:N Dep:R				
D 59 d5-EtFOSA	36.8070	47.1340	45.7690	40.0380	38.0250	41.1440	44.9320	38.0390	38.8640	44.7100	Avg:A Wt:C2	41.5462		RSD=9.1	
	88.6	113.4	110.2	96.4	91.5	99	108.1	91.6	93.5	107.6	Org:N Dep:R				
27 EtFOSA	1.488847	1.335978	1.069938	0.935911	1.094701	1.164738	0.992433	1.043006	1.161999	1.009442	Ln:A Wt:C2	1.042367	22.4410	R^2=0.991	
	99.8	106.6	91.9	85.5	102.9	110.7	94.8	99.8	111.3	96.7	Org:N Dep:R			RSE=8.7	
D 38 13C2_PFDoA	751	764	824	766	745	775	783	624	709	683	Avg:A Wt:C2	742		RSD=7.6	
	101.1	103	111	103.2	100.4	104.4	105.4	84.1	95.5	92.1	Org:N Dep:R				
11 PFDoA	1.203071	1.047758	1.013770	1.051741	0.942380	0.997848	1.014622	0.951126	0.927553	0.979381	Avg:A Wt:C2	1.012925		RSD=7.8	
	118.8	103.4	100.1	103.8	93	98.5	100.2	93.9	91.6	96.7	Org:N Dep:R				
4 10:2 FTS	3.962711	3.502179	5.322242	4.214461	4.683226	4.379310	4.094197	3.691728	3.624328	3.941042	Avg:A Wt:C2	4.141542		RSD=13.2	
	95.7	84.6	128.5	101.8	113.1	105.7	98.9	89.1	87.5	95.2	Org:N Dep:R				
34 PFDOS	0.961646	0.688365	0.788200	0.850372	0.773104	0.799596	0.843411	0.921802	0.879031	0.871188	Avg:A Wt:C2	0.837672		RSD=9.4	
	114.8	82.2	94.1	101.5	92.3	95.5	100.7	110	104.9	104	Org:N Dep:R				
24 PFTrDA	0.865096	0.889027	0.795691	0.800220	0.751036	0.797844	0.728467	0.822240	0.790279	0.792006	Avg:A Wt:C2	0.803191		RSD=5.9	
	107.7	110.7	99.1	99.6	93.5	99.3	90.7	102.4	98.4	98.6	Org:N Dep:R				
D 42 13C2_PFTeDA	857	906	910	886	846	885	881	766	853	960	Avg:A Wt:C2	875		RSD=5.8	
	98	103.5	104	101.2	96.7	101.1	100.7	87.6	97.4	109.7	Org:N Dep:R				
23 PFTeDA	0.875457	0.856690	0.821765	0.825215	0.748464	0.812728	0.806877	0.795894	0.788051	0.724492	Avg:A Wt:C2	0.805563		RSD=5.6	
	108.7	106.3	102	102.4	92.9	100.9	100.2	98.8	97.8	89.9	Org:N Dep:R				
D 40 13C2_PFHxDA	814	874	870	879	769	848	862	733	852	871	Avg:A Wt:C2	837		RSD=5.9	
	97.2	104.4	103.9	105	91.8	101.3	102.9	87.6	101.8	104	Org:N Dep:R				
35 PFHxDA	0.733171	0.654204	0.619485	0.586008	0.582836	0.580047	0.560434	0.571437	0.543605	0.544164	Avg:A Wt:C2	0.597539		RSD=9.8	
	122.7	109.5	103.7	98.1	97.5	97.1	93.8	95.6	91	91.1	Org:N Dep:R				
36 PFODA	1.009160	0.905721	0.933082	0.896012	0.910934	0.899798	0.900502	0.921096	0.877661	0.858878	Avg:A Wt:C2	0.911284		RSD=4.4	
	110.7	99.4	102.4	98.3	100	98.7	98.8	101.1	96.3	94.2	Org:N Dep:R				

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	664657	698745	719376	661837	592352	636307	624788	525891	605736	631298	1.28
* 39 13C2_PFHxA	625107	644196	668847	652725	582381	657478	598734	516865	562139	590710	1.41
* 41 13C2_PFOA	529331	570233	575643	538819	516348	530663	516445	442186	454391	469502	2.99
* 43 13C3_PFBA	495400	543881	539827	529552	474184	502696	494309	440120	466568	479357	0.82
* 48 13C4_PFOS	137646	151522	150490	136409	126954	145871	137216	109022	123534	136345	0.23

13C2_PFDA ((|631298 - 664657| / (631298 + 664657)) / 2) * 100 = 1.29

13C2_PFHxA ((|590710 - 625107| / (590710 + 625107)) / 2) * 100 = 1.41

13C2_PFOA ((|469502 - 529331| / (469502 + 529331)) / 2) * 100 = 2.99

13C3_PFBA ((|479357 - 495400| / (479357 + 495400)) / 2) * 100 = 0.82

13C4_PFOS ((|136345 - 137646| / (136345 + 137646)) / 2) * 100 = 0.24

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	546861	611000	599976	573156	563032	559024	540622	472283	515476	532517	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	27792	61406	116299	280637	493876	1050051	2626976	4618423	7437630	10063548	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	511058	575526	551519	531930	523546	535244	519236	438943	481475	494900	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	29191	63829	116903	278776	492704	1145498	2810598	4753112	7636713	10089689	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	168570	196377	187768	178777	169277	176333	182475	140086	163595	172404	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	10295	21796	43255	101809	183900	393955	996905	1711209	2848967	3892346	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	100328	110814	107529	109742	90196	99931	96504	89997	92997	98755	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	1846	4178	7049	19995	36192	84721	191602	321857	519802	758441	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	606218	659089	647271	645478	600114	624153	618656	499241	541057	589408	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	625107	644196	668847	652725	582381	657478	598734	516865	562139	590710	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	34447	63935	143111	325914	563542	1269473	3015523	5320058	8651109	11056552	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	8230	16071	31748	80873	146874	310342	752587	1308560	2061129	3019383	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	14733	33958	67171	147510	279651	581605	1457690	2465817	4208040	5617453	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1060670	1201204	1180333	1123208	1000599	1037606	1072603	951477	1030944	989899	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	31646	64035	119317	290119	486690	1024742	2677910	4590070	7410037	10153232	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	491967	543255	527406	513243	482787	473643	502901	424879	433987	455783	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	146484	153093	151195	150796	137682	146445	142331	109122	121799	129872	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	7473	15120	27748	71564	127027	275733	672418	1141998	1867043	2578419	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	46865	88846	179931	425708	745736	1651909	4068989	6693818	11436842	15069894	
2 6:2 FTS	Disabled	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	Disabled	5864	12135	21797	37216	82312	181602	332130	531520	669113	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	80931	86531	91676	80223	77321	86032	69383	65849	73618	72574	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	529331	570233	575643	538819	516348	530663	516445	442186	454391	469502	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	507486	557306	550354	515742	538966	487751	513973	399015	424537	452495	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	25772	53189	106595	247969	434061	943948	2349164	3834519	6508653	8363090	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	7479	14221	28597	65425	123362	270274	657184	1076256	1726431	2337970	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	136560	157938	156053	136027	139992	144663	138558	111576	131902	139484	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	137646	151522	150490	136409	126954	145871	137216	109022	123534	136345	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	10003	18423	28989	73628	134594	299625	735624	1249233	2026119	2937984	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	625469	675477	642980	626954	618881	632127	609273	525981	549315	585461	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	37873	73475	135915	317292	584147	1388347	3110938	5365192	8703707	12036723	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	23474	48365	100658	243770	411563	941910	2274633	4224322	7051525	9678417	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	274883	295385	289667	269529	250019	292812	260109	228568	249606	259213	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	15188	34015	57446	141156	272690	576769	1301753	2487137	4086381	5865187	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	5806	11055	24413	52773	91668	217788	528834	948237	1519794	2092634	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	89004	96102	96830	86993	72182	85033	84351	76412	83016	76382	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	33854	71781	148329	331458	577932	1314178	3094369	5385157	8039433	11323896	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	664657	698745	719376	661837	592352	636307	624788	525891	605736	631298	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	603465	657693	665774	609348	590501	586575	608241	490557	531780	554629	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1907	3808	9885	18869	36269	81040	187322	302480	485646	648111	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	652831	681319	738360	615697	601725	695403	633865	614018	738160	702845	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	6411	11955	19524	42880	92901	214866	508348	913087	1599797	2205543	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	Disabled	Disabled	Disabled	#54
	7201	10295	23053	49606	97617	206174	522072	Disabled	Disabled	Disabled	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	704613	715580	747498	633789	707587	720614	633568	526954	561767	616790	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	597877	660852	654230	602499	521292	613448	567342	469498	525972	533502	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	28941	68864	128315	309901	552500	1221346	2786976	4904060	7790693	10634436	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7168	12711	23367	52259	100636	252276	569109	952128	1536307	2170015	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	72578	83393	78711	74423	68295	72557	78650	69224	75256	78092	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	4353	9256	19866	38234	76750	181029	431866	767594	1230014	1817891	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	45910	50868	49248	47465	40777	50627	47865	48389	57210	53618	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	1642	4660	11430	26282	43643	102425	246128	465622	760759	1053502	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	21897	45501	88510	222145	399483	841216	2044902	3789526	5926895	8428925	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	83206	83324	80115	80042	68452	79874	80784	71557	74663	80774	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	5313	9972	23393	47049	82167	178542	430906	784695	1294585	1887024	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	36807	47134	45769	40038	38025	41144	44932	38039	38864	44710	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2740	6297	9794	18736	41626	95844	222960	396749	677399	902643	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	750529	764375	823994	766014	745164	774776	782694	624240	709060	683408	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	45147	80088	167068	402824	702228	1546218	3970694	5937306	9865365	13386339	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3400	6489	19872	35343	65175	143592	332917	543874	870137	1160751	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	6356	10524	23813	55986	104765	223941	565609	995597	1683536	2352565	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	32464	67955	131129	306490	559645	1236301	2850833	5132753	8405331	10825266	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	857358	906057	909992	885835	846373	884540	880859	766250	852681	960299	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	37529	77621	149560	365502	633480	1437780	3553725	6098540	10079344	13914583	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	813944	874055	869763	879100	768834	848036	861669	732913	851921	870576	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	29838	57181	107761	257580	448104	983802	2414543	4188135	6946632	9474720	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41070	79165	162312	393842	700357	1526123	3879673	6750830	11215472	14954365	

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	072221B017.d	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47
2	072221B018.d	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24
3	072221B019.d	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59
4	072221B020.d	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35
5	072221B021.d	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15
6	072221B022.d	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49
7	072221B023.d	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27
8	072221B024.d	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08
9	072221B025.d	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44
10	072221B026.d	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.749	1.749	1.742	1.749	1.743	1.743	1.749	1.756	1.750	1.749	1.748	0.253
8 PFBA	1.749	1.756	1.749	1.756	1.749	1.749	1.756	1.756	1.756	1.756	1.753	0.191
D 50 13C5_PFPeA	2.056	2.045	2.055	2.045	2.045	2.045	2.045	2.045	2.045	2.055	2.048	0.240
21 PFPeA	2.056	2.045	2.055	2.045	2.045	2.045	2.045	2.045	2.045	2.055	2.048	0.240
D 44 13C3_PFBS	2.087	2.077	2.087	2.077	2.087	2.087	2.077	2.088	2.088	2.087	2.084	0.245
7 PFBS	2.098	2.077	2.087	2.077	2.087	2.087	2.077	2.088	2.088	2.087	2.085	0.316
D 63 13C2_4:2 FTS_2	2.317	2.300	2.316	2.300	2.308	2.308	2.291	2.308	2.308	2.317	2.307	0.363
1 4:2 FTS	2.326	2.300	2.316	2.300	2.317	2.308	2.291	2.308	2.308	2.308	2.308	0.426
D 49 13C5_PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
* 39 13C2_PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
15 PFHxA	2.353	2.326	2.352	2.326	2.343	2.344	2.326	2.335	2.335	2.344	2.338	0.439
22 PFPeS	2.370	2.353	2.370	2.353	2.361	2.362	2.344	2.362	2.362	2.370	2.360	0.374
28 GenX	2.451	2.424	2.450	2.424	2.441	2.442	2.415	2.433	2.433	2.442	2.435	0.476
D 66 13C3_GenX	2.451	2.424	2.450	2.424	2.441	2.442	2.415	2.433	2.433	2.442	2.435	0.476
13 PFHpA	2.681	2.654	2.681	2.645	2.672	2.672	2.645	2.663	2.672	2.681	2.666	0.529
D 47 13C4_PFHpA	2.681	2.645	2.681	2.645	2.672	2.672	2.645	2.663	2.672	2.672	2.664	0.544
D 45 13C3_PFHxS	2.690	2.654	2.690	2.654	2.681	2.681	2.645	2.672	2.681	2.690	2.674	0.632
14 PFHxS	2.690	2.654	2.690	2.654	2.681	2.681	2.654	2.672	2.681	2.690	2.674	0.573
29 ADONA	2.718	2.681	2.717	2.681	2.708	2.709	2.681	2.700	2.709	2.708	2.701	0.540
2 6:2 FTS	Disabled	2.975	3.011	2.987	3.005	3.012	2.987	3.012	3.027	3.032	3.005	0.623
D 64 13C2_6:2 FTS_2	3.020	2.981	3.011	2.987	3.005	3.012	2.987	3.012	3.027	3.032	3.007	0.570
* 41 13C2_PFOA	3.041	3.006	3.038	3.012	3.025	3.039	3.012	3.034	3.047	3.052	3.030	0.533
D 53 13C8_PFOA	3.041	3.006	3.032	3.012	3.025	3.039	3.012	3.034	3.047	3.052	3.029	0.525
20 PFOA	3.047	3.012	3.038	3.012	3.025	3.039	3.012	3.041	3.047	3.052	3.032	0.529
12 PFHpS	3.047	3.006	3.038	3.018	3.032	3.039	3.012	3.041	3.054	3.059	3.034	0.586
D 54 13C8_PFOS	3.403	3.374	3.394	3.394	3.394	3.402	3.402	3.418	3.433	3.438	3.405	0.575
* 48 13C4_PFOS	3.411	3.374	3.401	3.394	3.394	3.402	3.394	3.418	3.433	3.438	3.405	0.575
18 PFOS	3.411	3.374	3.401	3.394	3.394	3.409	3.402	3.426	3.433	3.438	3.408	0.580
D 56 13C9_PFNA	3.418	3.381	3.401	3.402	3.401	3.409	3.402	3.433	3.440	3.446	3.413	0.602
17 PFNA	3.411	3.381	3.408	3.402	3.401	3.409	3.402	3.433	3.448	3.446	3.414	0.624
30 9Cl-PF3ONS	3.609	3.585	3.598	3.615	3.606	3.615	3.615	3.639	3.651	3.649	3.618	0.604
D 55 13C8_PFOSA	3.705	3.679	3.695	3.717	3.710	3.710	3.717	3.740	3.746	3.751	3.717	0.615
19 PFOSA	3.719	3.679	3.695	3.717	3.710	3.710	3.717	3.733	3.753	3.751	3.718	0.616

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.746	3.726	3.737	3.752	3.744	3.752	3.758	3.775	3.790	3.787	3.756	0.561
D 65 13C2_8:2 FTS_2	3.753	3.726	3.737	3.759	3.751	3.752	3.758	3.782	3.798	3.795	3.761	0.630
10 PFDA	3.760	3.733	3.751	3.766	3.758	3.759	3.765	3.790	3.806	3.803	3.769	0.624
* 37 13C2_PFDA	3.760	3.733	3.744	3.766	3.758	3.765	3.765	3.790	3.798	3.803	3.768	0.601
D 51 13C6_PFDA	3.753	3.733	3.744	3.766	3.758	3.759	3.765	3.782	3.798	3.803	3.766	0.595
3 8:2 FTS	3.760	3.733	3.744	3.759	3.758	3.759	3.758	3.782	3.798	3.795	3.764	0.557
D 58 d3-MeFOSAA	3.912	3.887	3.901	3.918	3.917	3.918	3.926	3.945	3.954	3.960	3.923	0.591
6 N-MeFOSAA	3.912	3.895	3.909	3.926	3.926	3.918	3.926	3.945	3.963	3.960	3.928	0.567
9 PFDS	4.045	4.027	4.040	4.068	4.058	4.059	4.068	Disabled	Disabled	Disabled	4.051	0.379
D 52 13C7_PFUdA	4.062	4.044	4.058	4.085	4.076	4.068	4.086	4.098	4.106	4.120	4.080	0.575
D 60 d5-EtFOSAA	4.062	4.044	4.058	4.094	4.085	4.076	4.095	4.107	4.115	4.120	4.085	0.622
25 PFUdA	4.062	4.044	4.058	4.085	4.085	4.076	4.086	4.107	4.115	4.120	4.083	0.612
5 N-EtFOSAA	4.071	4.053	4.058	4.094	4.093	4.076	4.095	4.116	4.115	4.129	4.090	0.618
D 61 d7-MeFOSE	4.124	4.106	4.120	4.157	4.147	4.139	4.157	4.169	4.169	4.182	4.146	0.587
32 MeFOSE	4.133	4.115	4.129	4.165	4.156	4.148	4.166	4.178	4.186	4.192	4.156	0.611
D 57 d3-MeFOSA	4.142	4.124	4.138	4.174	4.164	4.156	4.175	4.187	4.196	4.201	4.165	0.613
26 MeFOSA	4.151	4.133	4.138	4.183	4.173	4.156	4.175	4.187	4.196	4.201	4.169	0.568
31 11Cl-PF3OUDS	4.206	4.178	4.191	4.233	4.221	4.213	4.234	4.237	4.247	4.252	4.221	0.570
D 62 d9-EtFOSE	4.287	4.267	4.282	4.324	4.313	4.304	4.314	4.328	4.338	4.342	4.309	0.579
33 EtFOSE	4.298	4.277	4.292	4.334	4.323	4.314	4.335	4.338	4.347	4.352	4.321	0.576
D 59 d5-EtFOSA	4.308	4.287	4.302	4.344	4.333	4.314	4.335	4.347	4.357	4.361	4.328	0.571
27 EtFOSA	4.318	4.287	4.302	4.344	4.342	4.324	4.344	4.357	4.357	4.370	4.334	0.599
D 38 13C2_PFDoA	4.328	4.307	4.322	4.363	4.352	4.344	4.363	4.375	4.375	4.386	4.351	0.592
11 PFDoA	4.338	4.307	4.322	4.363	4.352	4.344	4.363	4.375	4.375	4.386	4.352	0.572
4 10:2 FTS	4.347	4.317	4.332	4.372	4.370	4.353	4.372	4.383	4.390	4.394	4.363	0.569
34 PFDOS	4.544	4.508	4.513	4.566	4.565	4.541	4.566	4.569	4.577	4.582	4.553	0.565
24 PFTrDA	4.561	4.535	4.549	4.591	4.590	4.574	4.591	4.594	4.602	4.607	4.579	0.531
D 42 13C2_PFTeDA	4.769	4.728	4.738	4.792	4.786	4.766	4.792	4.794	4.800	4.803	4.776	0.546
23 PFTeDA	4.769	4.735	4.738	4.792	4.786	4.766	4.792	4.794	4.800	4.803	4.777	0.516
D 40 13C2_PFHxDA	5.128	5.081	5.091	5.145	5.139	5.115	5.145	5.146	5.152	5.156	5.130	0.509
35 PFHxDA	5.128	5.081	5.091	5.151	5.145	5.121	5.145	5.146	5.152	5.156	5.131	0.517
36 PFODA	5.489	5.440	5.444	5.514	5.507	5.472	5.507	5.502	5.517	5.514	5.490	0.531

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b\072221B028.d
Injection Date: 23-Jul-2021 01:14:35 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC- 1577 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	697063			123.8	50 - 150
8 PFBA			500.00	412.81	82.6	70 - 130
D 50 13C5_PFPeA	523546	646174			123.4	50 - 150
21 PFPeA			500.00	413.60	82.7	70 - 130
7 PFBS			442.50	374.28	84.6	70 - 130
D 44 13C3_PFBS	169277	219583			129.7	50 - 150
D 63 13C2_4:2 FTS_2	90196	109973			121.9	50 - 150
1 4:2 FTS			467.50	512.75	109.7	70 - 130
D 49 13C5_PFHxA	600114	753591			125.6	50 - 150
15 PFHxA			500.00	402.35	80.5	70 - 130
22 PFPeS			470.00	393.01	83.6	70 - 130
28 GenX			2500.00	2196.01	87.8	70 - 130
D 66 13C3_GenX	1000599	1205811			120.5	50 - 150
D 47 13C4_PFHpA	482787	629323			130.4	50 - 150
13 PFHpA			500.00	403.53	80.7	70 - 130
D 45 13C3_PFHxS	137682	162385			117.9	50 - 150
14 PFHxS			456.00	378.36	83	70 - 130
29 ADONA			2355.00	2154.64	91.5	70 - 130
D 64 13C2_6:2 FTS_2	77321	92003			119	50 - 150
2 6:2 FTS			475.00	376.51	79.3	70 - 130
20 PFOA			500.00	424.92	85	70 - 130
D 53 13C8_PFOA	538966	589571			109.4	50 - 150
12 PFHpS			475.00	416.18	87.6	70 - 130
18 PFOS			462.75	397.81	86	70 - 130
D 54 13C8_PFOS	139992	170702			121.9	50 - 150
17 PFNA			500.00	381.86	76.4	70 - 130
D 56 13C9_PFNA	618881	769275			124.3	50 - 150
30 9Cl-PF3ONS			2330.00	1889.62	81.1	70 - 130
D 55 13C8_PFOSA	250019	323061			129.2	50 - 150
19 PFOSA			500.00	433.98	86.8	70 - 130
16 PFNS			480.00	405.71	84.5	70 - 130
D 65 13C2_8:2 FTS_2	72182	102430			141.9	50 - 150
10 PFDA			500.00	440.32	88.1	70 - 130
3 8:2 FTS			480.00	469.71	97.9	70 - 130
D 51 13C6_PFDA	590501	740625			125.4	50 - 150
D 58 d3-MeFOSAA	601725	791178			131.5	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	534.50	106.9	70 - 130
9 PFDS			482.50	416.99	86.4	70 - 130
D 52 13C7_PFUdA	707587	862142			121.8	50 - 150
25 PFUdA			500.00	410.40	82.1	70 - 130
D 60 d5-EtFOSAA	521292	662875			127.2	50 - 150
5 N-EtFOSAA			500.00	547.14	109.4	70 - 130
D 61 d7-MeFOSE	68295	98617			144.4	50 - 150
D 57 d3-MeFOSA	40777	55738			136.7	50 - 150
31 11Cl-PF3OUDS			2355.00	1917.40	81.4	70 - 130
D 62 d9-EtFOSE	68452	89797			131.2	50 - 150
D 59 d5-EtFOSA	38025	50890			133.8	50 - 150
11 PFDoA			500.00	395.66	79.1	70 - 130
D 38 13C2_PFDoA	745164	941425			126.3	50 - 150
4 10:2 FTS			2410.00	2228.22	92.5	70 - 130
24 PFTrDA			500.00	449.20	89.8	70 - 130
23 PFTeDA			500.00	437.70	87.5	70 - 130
D 42 13C2_PFTeDA	846373	1087648			128.5	50 - 150
D 40 13C2_PFHxDA	768834	934133			121.5	50 - 150

Report Date: 06-Aug-2021 18:04:58 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.385	2.711	3.216	3.259	3.195	3.475	3.345	3.289	3.387	3.422	3.268	2.523-3.866	0.22377	1.597
1 4:2 FTS	0.522	1.262	1.976	1.843	1.831	1.961	1.853	1.902	1.849	1.875	1.687	0.384-3.277	0.48219	0.915
15 PFHxA	17.651	17.071	18.236	18.609	17.663	17.772	18.954	17.307	19.329	19.230	18.182	14.934-20.391	0.90966	8.831
22 PFPeS	4.651	3.393	2.479	3.153	3.018	3.067	2.819	2.977	3.002	2.970	3.152	1.316-4.719	0.56726	1.509
28 GenX	0.997	0.787	0.773	0.768	0.744	0.775	0.759	0.782	0.817	0.778	0.798	0.528-0.959	0.07198	0.372
13 PFHpA	3.408	3.519	4.020	3.461	3.312	3.880	3.835	3.775	3.628	3.741	3.657	2.576-4.047	0.24506	1.656
14 PFHxS	3.231	2.617	3.554	3.335	3.115	3.031	2.985	3.111	3.012	3.084	3.107	2.368-3.861	0.24887	1.557
29 ADONA	2.921	2.622	3.386	2.988	3.029	3.080	3.196	3.140	2.951	2.861	3.017	2.438-3.619	0.19676	1.514
2 6:2 FTS	1.357	1.903	1.287	1.619	1.859	1.923	1.857	1.885	1.900	1.898	1.748	1.095-2.622	0.25436	0.929
20 PFOA	3.365	2.607	2.979	3.061	2.922	2.919	2.952	2.847	2.789	2.815	2.925	2.356-3.487	0.18840	1.461
12 PFHpS	2.433	2.465	2.857	3.112	2.909	2.930	3.026	2.927	2.984	2.895	2.853	2.189-3.628	0.23973	1.454
18 PFOS	3.318	2.855	3.552	3.195	3.336	3.588	3.462	3.189	3.479	3.526	3.350	2.685-3.986	0.21688	1.668
17 PFNA	8.588	6.466	6.371	6.223	6.449	6.714	6.308	6.327	6.063	6.064	6.557	4.217-8.680	0.74392	3.224
19 PFOSA	59.934	39.783	21.362	31.375	30.764	26.376	31.760	28.842	31.933	31.524	33.365	-0.588-62.116	10.45078	15.382
16 PFNS	2.386	2.334	2.478	3.369	2.773	2.633	2.714	2.522	2.548	2.605	2.636	1.939-3.606	0.27784	1.386
3 8:2 FTS	6.221	2.579	2.059	2.413	1.841	1.914	1.772	1.845	1.947	1.888	2.447	-2.296-5.978	1.37918	0.920
10 PFDA	14.443	12.588	11.362	12.626	11.952	13.461	13.730	14.163	13.325	13.254	13.090	9.118-14.785	0.94460	5.976
6 N-MeFOSAA	1.713	1.110	1.399	1.648	1.209	1.345	1.289	1.313	1.229	1.351	1.360	0.647-1.770	0.18705	0.604
9 PFDS	2.412	2.721	2.874	2.028	2.842	2.691	2.748	2.907	2.678	2.637	2.653	2.033-3.650	0.26934	1.421
5 N-EtFOSAA	2.311	1.227	1.272	1.769	1.522	1.520	1.740	1.720	1.564	1.669	1.631	0.639-2.404	0.29422	0.761
25 PFUdA	18.788	13.560	15.786	14.905	13.054	14.403	13.520	13.975	13.121	13.749	14.486	7.430-18.677	1.87448	6.527
26 MeFOSA	1.347	0.935	1.267	1.077	1.256	0.958	1.049	1.050	0.969	1.061	1.096	0.806-1.705	0.14997	0.628
27 EtFOSA	0.850	1.287	1.000	1.023	1.026	1.061	1.015	1.009	1.012	0.990	1.027	0.702-1.349	0.10776	0.513
11 PFDoA	12.549	10.239	9.448	10.989	11.727	10.436	10.711	10.832	10.789	10.051	10.777	9.247-14.206	0.82652	5.863
4 10:2 FTS	4.537	4.967	3.002	4.893	3.388	3.337	3.238	3.503	3.028	3.384	3.727	0.982-5.793	0.80193	1.694
34 PFDOS	3.143	3.093	2.927	3.023	3.139	3.123	3.110	3.109	3.056	3.182	3.090	2.912-3.365	0.07550	1.569
24 PFTrDA	7.838	8.089	8.167	8.469	8.162	8.190	7.598	7.921	8.352	7.905	8.069	7.415-8.908	0.24888	4.081
23 PFTeDA	13.088	12.889	11.077	12.009	11.901	11.683	11.505	11.287	10.942	10.447	11.682	9.536-14.265	0.78821	5.950
35 PFHxDA	9.617	10.626	11.071	11.484	10.092	10.682	10.645	10.167	10.565	10.395	10.534	8.523-11.660	0.52299	5.046
36 PFODA	13.693	13.972	13.664	13.425	13.176	13.335	13.170	13.136	12.704	12.820	13.309	11.980-14.371	0.39860	6.588

Report Date: 06-Aug-2021 18:04:57 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	583	578	580	569	575	554	539	539	517	521	Avg:A Wt:C2	555		RSD=4.5	
	105	104.1	104.4	102.4	103.5	99.7	97.1	97	93	93.8	Org:N Dep:R				
8 PFBA	1.004053	1.019480	1.038355	0.976216	0.993377	0.975749	1.013451	0.999585	0.983627	0.990411	Avg:A Wt:C2	0.999430		RSD=2.0	
	100.5	102	103.9	97.7	99.4	97.6	101.4	100	98.4	99.1	Org:N Dep:R				
D 50 13C5_PFPeA	568	531	539	526	538	510	506	502	488	496	Avg:A Wt:C2	521		RSD=4.7	
	109.1	102	103.6	101.1	103.4	97.9	97.3	96.5	93.8	95.3	Org:N Dep:R				
21 PFPeA	1.118171	1.125688	1.129754	1.066718	1.008563	1.052344	1.119375	1.120591	1.074828	1.087357	Avg:A Wt:C2	1.090339		RSD=3.7	
	102.6	103.2	103.6	97.8	92.5	96.5	102.7	102.8	98.6	99.7	Org:N Dep:R				
D 44 13C3_PFBS	186	183	183	168	187	179	177	179	177	175	Avg:A Wt:C2	179		RSD=3.2	
	103.8	102	102.2	93.8	104.3	99.6	98.6	100	98.5	97.3	Org:N Dep:R				
7 PFBS	1.205215	1.132625	1.193934	1.256208	1.173938	1.198576	1.228894	1.161848	1.164879	1.206561	Avg:A Wt:C2	1.192268		RSD=3.0	
	101.1	95	100.1	105.4	98.5	100.5	103.1	97.4	97.7	101.2	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	1.528166	2.153468	2.357496	2.309037	2.148042	2.243890	2.184305	2.165477	2.318891	2.127728	Avg:A Wt:C2	2.153650		RSD=10.9	
	71	100	109.5	107.2	99.7	104.2	101.4	100.5	107.7	98.8	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	21.9154	19.6486	21.4224	19.2772	20.6338	19.9576	19.5858	19.4678	17.8280	20.0674	Avg:A Wt:C2	19.9804		RSD=5.8	
	109.7	98.3	107.2	96.5	103.3	99.9	98	97.4	89.2	100.4	Org:N Dep:R				
D 49 13C5_PFHxA	579	640	621	566	593	570	599	572	567	541	Avg:A Wt:C2	585		RSD=5.0	
	99	109.4	106.3	96.8	101.4	97.4	102.4	97.9	96.9	92.5	Org:N Dep:R				
15 PFHxA	1.091188	0.966005	1.038296	1.067496	1.078899	1.066743	1.013346	1.015191	1.030783	1.081176	Avg:A Wt:C2	1.044912		RSD=3.8	
	104.4	92.4	99.4	102.2	103.3	102.1	97	97.2	98.6	103.5	Org:N Dep:R				
22 PFPeS	0.947309	0.971129	0.813326	0.948041	0.881083	0.899984	0.869926	0.868336	0.863477	0.910901	Avg:A Wt:C2	0.897351		RSD=5.4	
	105.6	108.2	90.6	105.6	98.2	100.3	96.9	96.8	96.2	101.5	Org:N Dep:R				
28 GenX	0.878227	0.707619	0.690457	0.670290	0.647908	0.677389	0.663699	0.679883	0.705786	0.661720	Avg:A Wt:C2	0.698298		RSD=9.5	
	125.8	101.3	98.9	96	92.8	97	95	97.4	101.1	94.8	Org:N Dep:R				
D 66 13C3_GenX	227	227	217	216	221	217	217	207	198	206	Avg:A Wt:C2	215		RSD=4.3	
	105.4	105.3	100.9	100.4	102.8	100.7	100.7	96.3	91.9	95.6	Org:N Dep:R				
13 PFHpA	1.164429	1.043231	1.177880	1.038497	1.126253	1.177351	1.111663	1.103567	1.111430	1.116440	Avg:A Wt:C2	1.117074		RSD=4.4	
	104.2	93.4	105.4	93	100.8	105.4	99.5	98.8	99.5	99.9	Org:N Dep:R				
D 47 13C4_PFHpA	502	515	495	527	479	468	476	488	446	441	Avg:A Wt:C2	484		RSD=5.7	
	103.7	106.5	102.2	108.9	99	96.8	98.5	100.8	92.3	91.2	Org:N Dep:R				
D 45 13C3_PFHxS	141	149	138	136	140	136	127	120	133	123	Avg:A Wt:C2	134		RSD=6.6	
	105.3	110.7	102.9	101.3	103.9	101.6	94.4	89.5	99	91.3	Org:N Dep:R				
14 PFHxS	1.152434	1.094080	1.041669	1.169224	0.993804	1.023542	1.173895	1.168265	1.030747	1.105811	Avg:A Wt:C2	1.095347		RSD=6.3	
	105.2	99.9	95.1	106.7	90.7	93.4	107.2	106.7	94.1	101	Org:N Dep:R				
29 ADONA	6.355175	6.061988	6.743659	6.859141	6.525829	6.678302	7.213248	6.949509	5.992249	6.506007	Avg:A Wt:C2	6.588511		RSD=5.8	
	96.5	92	102.4	104.1	99	101.4	109.5	105.5	90.9	98.7	Org:N Dep:R				
2 6:2 FTS	2.651454	2.479325	2.205313	2.203108	2.297675	2.565345	2.432903	2.331638	2.494044	2.648860	Avg:A Wt:C2	2.430967		RSD=6.9	
	109.1	102	90.7	90.6	94.5	105.5	100.1	95.9	102.6	109	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	16.7172	18.5160	17.3440	17.1842	17.3988	15.9728	15.2556	15.7106	13.7414	13.5124	Avg:A Wt:C2	16.1353		RSD=10.1	
	103.6	114.8	107.5	106.5	107.8	99	94.5	97.4	85.2	83.7	Org:N Dep:R				
D 53 13C8_PFOA	514	503	505	477	487	448	445	435	421	425	Avg:A Wt:C2	466		RSD=7.6	
	110.3	108	108.3	102.3	104.5	96.1	95.5	93.3	90.4	91.2	Org:N Dep:R				
20 PFOA	1.116683	0.962854	0.977141	0.989201	0.983422	1.005103	1.032107	1.002842	0.936265	0.947620	Avg:A Wt:C2	0.995324		RSD=5.1	
	112.2	96.7	98.2	99.4	98.8	101	103.7	100.8	94.1	95.2	Org:N Dep:R				
12 PFHpS	0.967700	0.869401	1.004112	1.018131	0.968107	0.909187	0.996441	1.013303	0.865096	0.903733	Avg:A Wt:C2	0.951521		RSD=6.3	
	101.7	91.4	105.5	107	101.7	95.6	104.7	106.5	90.9	95	Org:N Dep:R				
D 54 13C8_PFOS	132	144	131	135	131	141	128	134	131	125	Avg:A Wt:C2	133		RSD=4.3	
	99.6	108.4	98.4	101.2	98.2	105.8	95.8	100.4	98.3	94	Org:N Dep:R				
18 PFOS	1.053986	1.248155	1.091214	1.087392	1.222981	1.082154	1.182121	1.130210	1.096348	1.140064	Avg:A Wt:C2	1.133462		RSD=5.7	
	93	110.1	96.3	95.9	107.9	95.5	104.3	99.7	96.7	100.6	Org:N Dep:R				
17 PFNA	1.236892	1.080477	1.074969	1.136775	1.095787	1.058805	1.154111	1.030137	1.074460	1.056308	Avg:A Wt:C2	1.099872		RSD=5.5	
	112.5	98.2	97.7	103.4	99.6	96.3	104.9	93.7	97.7	96	Org:N Dep:R				
D 56 13C9_PFNA	604	595	587	548	581	594	544	588	522	535	Avg:A Wt:C2	570		RSD=5.1	
	106.1	104.4	103.1	96.1	101.9	104.2	95.4	103.2	91.7	94	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.953224	3.686073	3.927216	3.767651	3.794270	3.586402	3.944701	3.883931	3.479161	3.902807	Avg:A Wt:C2	3.792544		RSD=4.3	
	104.2	97.2	103.6	99.3	100	94.6	104	102.4	91.7	102.9	Org:N Dep:R				
D 55 13C8_PFOSA	286	274	299	267	268	274	268	277	260	256	Avg:A Wt:C2	273		RSD=4.6	
	105	100.4	109.6	97.8	98.3	100.5	98.1	101.5	95.2	93.8	Org:N Dep:R				
19 PFOSA	1.272218	1.118180	1.056716	1.117246	1.197035	1.062007	1.098814	1.063340	1.075551	1.141871	Avg:A Wt:C2	1.120298		RSD=6.1	
	113.6	99.8	94.3	99.7	106.8	94.8	98.1	94.9	96	101.9	Org:N Dep:R				
16 PFNS	0.932193	0.679926	0.860624	0.851425	0.906502	0.741240	0.845303	0.789952	0.753499	0.823073	Avg:A Wt:C2	0.818374		RSD=9.5	
	113.9	83.1	105.2	104	110.8	90.6	103.3	96.5	92.1	100.6	Org:N Dep:R				
3 8:2 FTS	1.739227	2.613652	2.441764	2.442471	2.285084	2.291640	2.080875	2.132501	2.313332	2.055335	Avg:A Wt:C2	2.239588		RSD=11.1	
	77.7	116.7	109	109.1	102	102.3	92.9	95.2	103.3	91.8	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	21.8824	20.8836	19.6498	19.1428	19.4796	18.2004	18.4624	19.0376	16.4172	17.9062	Avg:A Wt:C2	19.1062		RSD=8.0	
	114.5	109.3	102.8	100.2	102	95.3	96.6	99.6	85.9	93.7	Org:N Dep:R				
10 PFDA	1.330662	1.237001	1.123763	1.063063	1.161375	1.166171	1.187292	1.165630	1.120399	1.065649	Avg:A Wt:C2	1.162101		RSD=6.8	
	114.5	106.4	96.7	91.5	99.9	100.4	102.2	100.3	96.4	91.7	Org:N Dep:R				
D 51 13C6_PFDA	575	578	571	604	543	544	542	517	493	491	Avg:A Wt:C2	546		RSD=6.8	
	105.4	106	104.7	110.6	99.5	99.6	99.4	94.7	90.3	89.9	Org:N Dep:R				
D 58 d3-MeFOSAA	133	134	121	135	119	113	125	117	123	130	Avg:A Wt:C2	125		RSD=6.1	
	106.1	107.4	97	107.9	95.3	90.7	99.5	93.8	98.1	104.1	Org:N Dep:R				
6 N-MeFOSAA	0.773117	0.776166	0.857448	0.849580	0.817421	0.909099	0.816861	0.860324	0.752251	0.776814	Avg:A Wt:C2	0.818908		RSD=6.1	
	94.4	94.8	104.7	103.7	99.8	111	99.8	105.1	91.9	94.9	Org:N Dep:R				
9 PFDS	0.757289	0.808987	0.951599	0.785042	0.857176	0.760160	0.889506	0.829502	0.793250	0.833182	Avg:A Wt:C2	0.826569		RSD=7.3	
	91.6	97.9	115.1	95	103.7	92	107.6	100.4	96	100.8	Org:N Dep:R				
D 60 d5-EtFOSAA	119	122	118	113	119	112	112	105	96.9860	96.6390	Avg:A Wt:C2	111		RSD=8.1	
	106.7	109.4	106	101.3	106.6	100.9	100.7	94.3	87.2	86.9	Org:N Dep:R				
D 52 13C7_PFUdA	612	637	604	612	632	576	634	583	511	525	Avg:A Wt:C2	593		RSD=7.5	
	103.3	107.6	101.9	103.2	106.6	97.2	107	98.3	86.2	88.6	Org:N Dep:R				
5 N-EtFOSAA	1.268099	0.944172	0.857714	1.106244	1.026992	1.045322	1.037782	1.055023	1.052635	1.096378	Avg:A Wt:C2	1.049036		RSD=10.1	
	120.9	90	81.8	105.5	97.9	99.6	98.9	100.6	100.3	104.5	Org:N Dep:R				
25 PFUdA	1.109129	0.923734	0.972122	0.956131	0.828666	0.990463	0.852849	0.953349	0.951635	0.928470	Avg:A Wt:C2	0.946655		RSD=8.1	
	117.2	97.6	102.7	101	87.5	104.6	90.1	100.7	100.5	98.1	Org:N Dep:R				
D 61 d7-MeFOSE	92.5590	94.3550	79.2300	82.8840	89.0850	80.5440	84.3840	80.8070	73.5870	76.0150	Avg:A Wt:C2	83.3450		RSD=8.2	
	111.1	113.2	95.1	99.4	106.9	96.6	101.2	97	88.3	91.2	Org:N Dep:R				
32 MeFOSE	1.008006	0.892587	1.401237	1.178177	0.958186	1.132064	1.159981	1.151054	1.164764	1.220194	Avg:A Wt:C2	1.126625		RSD=12.8	
	89.5	79.2	124.4	104.6	85	100.5	103	102.2	103.4	108.3	Org:N Dep:R				
D 57 d3-MeFOSA	53.3810	47.8490	48.2120	46.9290	50.5890	48.3420	49.4670	54.0320	50.4870	54.7650	Avg:A Wt:C2	50.4053		RSD=5.5	
	105.9	94.9	95.6	93.1	100.4	95.9	98.1	107.2	100.2	108.6	Org:N Dep:R				
26 MeFOSA	1.155842	0.958850	1.318863	1.081847	1.045306	1.096324	1.036926	0.969975	0.950398	0.974225	Avg:A Wt:C2	1.058856		RSD=10.7	
	109.2	90.6	124.6	102.2	98.7	103.5	97.9	91.6	89.8	92	Org:N Dep:R				
31 11Cl-PF3OUDS	3.140130	3.280394	3.744225	3.384047	3.180007	2.973551	3.614202	3.339559	3.126329	3.481807	Avg:A Wt:C2	3.326425		RSD=7.1	
	94.4	98.6	112.6	101.7	95.6	89.4	108.7	100.4	94	104.7	Org:N Dep:R				
D 62 d9-EtFOSE	95.5530	98.1780	95.6480	95.4970	90.5290	91.4170	96.5180	91.0680	88.3210	92.9310	Avg:A Wt:C2	93.5660		RSD=3.4	
	102.1	104.9	102.2	102.1	96.8	97.7	103.2	97.3	94.4	99.3	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	0.788463	1.028438	0.918995	0.921181	1.009411	1.005043	0.905800	1.031045	0.957527	0.986923	Avg:A Wt:C2	0.955283		RSD=7.8	
	82.5	107.7	96.2	96.4	105.7	105.2	94.8	107.9	100.2	103.3	Org:N Dep:R				
D 59 d5-EtFOSA	44.6190	44.7820	44.4530	45.1920	43.4420	42.9720	45.6340	46.6400	45.8460	38.6150	Avg:A Wt:C2	44.2195		RSD=5.1	
	100.9	101.3	100.5	102.2	98.2	97.2	103.2	105.5	103.7	87.3	Org:N Dep:R				
27 EtFOSA	1.154217	1.379795	1.087778	1.053417	1.120091	1.144734	1.080173	1.022796	1.012080	1.238848	Avg:A Wt:C2	1.129393		RSD=9.8	
	102.2	122.2	96.3	93.3	99.2	101.4	95.6	90.6	89.6	109.7	Org:N Dep:R				
D 38 13C2_PFDoA	598	607	604	596	596	596	604	571	524	536	Avg:A Wt:C2	583		RSD=5.1	
	102.6	104.1	103.5	102.2	102.1	102.2	103.6	97.9	89.9	91.9	Org:N Dep:R				
11 PFDoA	1.133242	0.994525	1.038141	1.035797	1.143065	1.034548	1.027268	1.038156	1.105773	1.032070	Avg:A Wt:C2	1.058259		RSD=4.7	
	107.1	94	98.1	97.9	108	97.8	97.1	98.1	104.5	97.5	Org:N Dep:R				
4 10:2 FTS	2.576959	2.531817	2.217775	3.249762	2.539895	2.700570	2.560469	2.379769	2.573520	2.481532	Avg:A Wt:C2	2.581207		RSD=10.4	
	99.8	98.1	85.9	125.9	98.4	104.6	99.2	92.2	99.7	96.1	Org:N Dep:R				
34 PFDOS	0.754003	0.690849	0.803456	0.713529	0.757448	0.676327	0.796981	0.741673	0.726735	0.824843	Avg:A Wt:C2	0.748584		RSD=6.5	
	100.7	92.3	107.3	95.3	101.2	90.3	106.5	99.1	97.1	110.2	Org:N Dep:R				
24 PFTrDA	1.061395	0.914742	0.965012	0.964646	0.935726	0.902761	0.889030	0.912387	0.955374	0.922175	Avg:A Wt:C2	0.942325		RSD=5.2	
	112.6	97.1	102.4	102.4	99.3	95.8	94.3	96.8	101.4	97.9	Org:N Dep:R				
D 42 13C2_PFTeDA	910	905	913	902	903	881	894	854	869	915	Avg:A Wt:C2	895		RSD=2.2	
	101.7	101.1	102	100.8	100.9	98.4	100	95.5	97.2	102.3	Org:N Dep:R				
23 PFTeDA	0.776447	0.845574	0.822542	0.807523	0.824770	0.816884	0.834380	0.838668	0.756248	0.716867	Avg:A Wt:C2	0.803990		RSD=5.2	
	96.6	105.2	102.3	100.4	102.6	101.6	103.8	104.3	94.1	89.2	Org:N Dep:R				
35 PFHxDA	0.829097	0.719539	0.700137	0.713023	0.682805	0.666796	0.669502	0.662127	0.644881	0.653555	Avg:A Wt:C2	0.694146		RSD=7.7	
	119.4	103.7	100.9	102.7	98.4	96.1	96.4	95.4	92.9	94.2	Org:N Dep:R				
D 40 13C2_PFHxDA	855	871	865	844	846	838	840	815	791	796	Avg:A Wt:C2	836		RSD=3.2	
	102.2	104.1	103.4	101	101.2	100.2	100.5	97.5	94.6	95.2	Org:N Dep:R				
36 PFODA	0.876692	0.849879	0.832612	0.842030	0.854820	0.849321	0.868999	0.899394	0.870938	0.895069	Avg:A Wt:C2	0.863976		RSD=2.6	
	101.5	98.4	96.4	97.5	98.9	98.3	100.6	104.1	100.8	103.6	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	680773	656265	644351	676478	599597	638773	653149	598439	573738	596061	3.31
* 39 13C2_PFHxA	604810	629952	629151	591024	618541	558455	596847	576353	566357	582971	0.91
* 41 13C2_PFOA	531307	523758	503548	507041	517799	470704	475387	469635	451035	449899	4.14
* 43 13C3_PFBA	531675	553692	543608	523676	536669	514302	509696	496075	467408	493921	1.84
* 48 13C4_PFOS	131459	137543	142111	135999	135966	141542	132480	133041	132929	130700	0.14

13C2_PFDA ((|596061 - 680773| / (596061 + 680773)) / 2) * 100 = 3.32
13C2_PFHxA ((|582971 - 604810| / (582971 + 604810)) / 2) * 100 = 0.92
13C2_PFOA ((|449899 - 531307| / (449899 + 531307)) / 2) * 100 = 4.15
13C3_PFBA ((|493921 - 531675| / (493921 + 531675)) / 2) * 100 = 1.84
13C4_PFOS ((|130700 - 131459| / (130700 + 131459)) / 2) * 100 = 0.14

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	583037	578040	579662	568958	574801	553883	539298	538949	516545	521110	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	29270	58930	120379	277713	570994	1080902	2732761	5387255	7621312	10322261	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	567820	531053	539405	526259	538043	509525	506458	502499	488249	496034	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	31746	59780	121879	280685	542650	1072391	2834581	5630957	7871752	10787319	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	186163	183013	183412	168263	187099	178632	176862	179385	176633	174515	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	9917	18324	38716	93427	194164	378536	960663	1842416	2728326	3722753	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	1564	3952	9434	20787	41397	83654	199789	393747	579190	797598	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	109577	98243	107112	96386	103169	99788	97929	97339	89140	100337	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	578782	639924	621499	566329	593317	569799	598753	572424	567003	541168	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	604810	629952	629151	591024	618541	558455	596847	576353	566357	582971	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	31578	61817	129060	302277	640129	1215658	3033720	5811197	8766855	11701956	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	8271	16671	27985	74815	154629	301597	721589	1461090	2145936	2982201	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	19924	32083	59984	144840	286949	587381	1439607	2820691	4189975	5449351	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1134331	1133484	1085948	1080428	1107213	1083907	1084533	1037197	989435	1029391	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	29210	53760	116494	273621	539535	1103128	2648376	5380903	7440515	9845240	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	501705	515322	494507	526956	479053	468479	476471	487592	446303	440921	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	141373	148622	138208	135982	139557	136474	126738	120218	132990	122588	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	7413	14797	26202	72342	126210	254230	676936	1278063	1871129	2467177	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	42317	84869	175594	439311	857903	1717105	4305847	7869996	11260326	15026001	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	2101	4352	7252	17945	37898	77690	175927	347266	487343	678625	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	83586	92580	86720	85921	86994	79864	76278	78553	68707	67562	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	513933	502911	504574	476730	486725	447692	444611	434718	421315	424838	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	28695	48423	98608	235791	478656	899953	2294431	4359533	5916935	8051702	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	531307	523758	503548	507041	517799	470704	475387	469635	451035	449899	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	6512	12301	26423	65901	128621	236249	601126	1159700	1642901	2109380	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	131459	137543	142111	135999	135966	141542	132480	133041	132929	130700	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	132461	144256	130949	134615	130612	140706	127507	133503	130718	124994	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	6478	16709	26521	67920	148235	282605	699381	1400226	1994908	2644821	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	37367	64290	126231	311244	636270	1257170	3137237	6053992	8417210	11311416	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	604208	595015	587138	547591	580651	593674	543663	587688	522260	535422	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	24402	49558	95859	236347	461878	940627	2343873	4832573	6357949	9093104	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	286429	273954	298997	266840	268160	274235	267652	277015	259856	255949	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	18220	30633	63191	149063	320997	582479	1470499	2945612	4192324	5845215	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	5927	9416	21638	55015	113664	200250	517354	1012425	1418340	1975281	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1823	5229	9193	22396	42643	79914	184022	388926	545750	705150	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	109412	104418	98249	95714	97398	91002	92312	95188	82086	89531	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	38261	71551	128400	320807	630572	1268223	3220144	6027587	8284110	10462370	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	575067	578423	571295	603552	542953	543755	542435	517110	492926	490892	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	680773	656265	644351	676478	599597	638773	653149	598439	573738	596061	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	663677	671506	606917	675181	596376	567408	622577	586416	613690	650996	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	5131	10424	20816	57362	97498	206332	508559	1009015	1384946	2022812	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	4835	11250	24025	50937	107927	206217	546676	1067543	1499388	2007873	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	593250	608417	589241	563411	592804	561157	559787	524300	484930	483195	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	612192	637413	603947	611772	631526	575835	633919	582568	511026	525183	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7523	11489	20216	62327	121761	234636	580937	1106297	1531363	2119058	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	33950	58880	117422	292467	523324	1140686	2703185	5553906	7294654	9752333	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	92559	94355	79230	82884	89085	80544	84384	80807	73587	76015	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	4665	8422	22204	48826	85360	182362	489419	930132	1285672	1855061	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	53381	47849	48212	46929	50589	48342	49467	54032	50487	54765	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	3085	4588	12717	25385	52881	105997	256468	524097	719741	1067069	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	19591	44577	92373	214561	391257	788259	2170538	4199824	5774472	8199262	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	95553	98178	95648	95497	90529	91417	96518	91068	88321	92931	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	3767	10097	17580	43985	91381	183756	437130	938952	1268546	1834314	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	44619	44782	44453	45192	43442	42972	45634	46640	45846	38615	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2575	6179	9671	23803	48659	98383	246463	477032	695997	956762	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	598213	607275	603858	595993	595792	595946	604365	571044	524494	535827	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	33896	60395	125378	308664	681029	1233069	3104224	5928328	8699570	11060221	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	2718	5097	8402	29985	47695	94764	227853	436741	610935	856703	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	4834	9647	20369	46489	95766	184236	491844	958471	1379361	1996024	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	31747	55550	116546	287461	557498	1075994	2686493	5210130	7516321	9882522	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	909914	904534	912519	901768	902749	880637	894200	854370	869439	915148	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	35325	76485	150117	364099	744560	1438756	3730513	7165326	9862676	13120795	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	35432	62652	121064	300946	577451	1117260	2813373	5396284	7654353	10407257	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	854713	870724	864574	844141	845704	837783	840438	814992	791293	796204	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	37466	74001	143971	355396	722925	1423094	3651699	7329992	10337513	14253151	

Report Date: 06-Aug-2021 18:04:57 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.705	1.704	1.704	1.705	1.710	1.704	1.704	1.699	1.704	1.704	1.704	0.169
8 PFBA	1.705	1.711	1.711	1.705	1.710	1.711	1.704	1.705	1.704	1.704	1.707	0.175
D 50 13C5_PFPeA	2.078	2.076	2.076	2.078	2.066	2.076	2.076	2.067	2.076	2.066	2.073	0.256
21 PFPeA	2.078	2.076	2.076	2.078	2.066	2.076	2.076	2.067	2.066	2.076	2.073	0.256
D 44 13C3_PFBS	2.131	2.129	2.129	2.131	2.119	2.129	2.129	2.120	2.129	2.129	2.127	0.214
7 PFBS	2.131	2.129	2.129	2.131	2.119	2.129	2.129	2.130	2.129	2.129	2.128	0.170
1 4:2 FTS	2.398	2.397	2.397	2.398	2.388	2.397	2.397	2.389	2.397	2.397	2.395	0.155
D 63 13C2_4:2 FTS_2	2.398	2.397	2.397	2.398	2.388	2.397	2.397	2.389	2.388	2.388	2.393	0.202
D 49 13C5_PFHxA	2.434	2.433	2.433	2.434	2.423	2.433	2.433	2.434	2.432	2.433	2.431	0.123
* 39 13C2_PFHxA	2.434	2.433	2.433	2.434	2.423	2.433	2.433	2.434	2.432	2.433	2.431	0.123
15 PFHxA	2.434	2.441	2.442	2.434	2.423	2.433	2.433	2.434	2.432	2.433	2.433	0.208
22 PFPeS	2.470	2.468	2.468	2.470	2.450	2.468	2.468	2.460	2.459	2.468	2.465	0.257
28 GenX	2.550	2.548	2.549	2.550	2.539	2.548	2.548	2.541	2.548	2.548	2.547	0.146
D 66 13C3_GenX	2.550	2.548	2.549	2.550	2.539	2.548	2.548	2.550	2.548	2.548	2.547	0.117
13 PFHpA	2.800	2.808	2.808	2.809	2.790	2.799	2.799	2.800	2.799	2.799	2.801	0.219
D 47 13C4_PFHpA	2.809	2.808	2.808	2.809	2.790	2.799	2.799	2.800	2.799	2.799	2.802	0.237
D 45 13C3_PFHxS	2.818	2.817	2.817	2.819	2.808	2.817	2.817	2.818	2.817	2.817	2.816	0.117
14 PFHxS	2.828	2.826	2.826	2.819	2.808	2.817	2.817	2.818	2.817	2.817	2.819	0.214
29 ADONA	2.846	2.845	2.845	2.846	2.826	2.844	2.844	2.836	2.844	2.844	2.842	0.214
2 6:2 FTS	3.160	3.152	3.158	3.160	3.145	3.158	3.158	3.153	3.158	3.158	3.156	0.159
D 64 13C2_6:2 FTS_2	3.160	3.158	3.165	3.154	3.145	3.158	3.158	3.153	3.158	3.158	3.156	0.175
D 53 13C8_PFOA	3.187	3.185	3.185	3.180	3.165	3.178	3.178	3.180	3.178	3.178	3.179	0.198
20 PFOA	3.187	3.185	3.185	3.180	3.171	3.185	3.185	3.180	3.178	3.185	3.182	0.148
* 41 13C2_PFOA	3.187	3.185	3.185	3.187	3.171	3.178	3.178	3.180	3.178	3.178	3.180	0.156
12 PFHpS	3.187	3.185	3.192	3.187	3.171	3.185	3.185	3.187	3.185	3.185	3.184	0.159
* 48 13C4_PFOS	3.560	3.566	3.558	3.560	3.534	3.550	3.558	3.552	3.550	3.558	3.554	0.245
D 54 13C8_PFOS	3.560	3.558	3.558	3.552	3.542	3.550	3.558	3.552	3.558	3.550	3.554	0.156
18 PFOS	3.552	3.550	3.558	3.560	3.542	3.558	3.558	3.560	3.550	3.558	3.554	0.162
17 PFNA	3.568	3.566	3.566	3.560	3.550	3.558	3.558	3.560	3.558	3.558	3.560	0.145
D 56 13C9_PFNA	3.568	3.558	3.566	3.560	3.550	3.558	3.558	3.560	3.558	3.558	3.559	0.132
30 9Cl-PF3ONS	3.766	3.765	3.765	3.766	3.751	3.765	3.758	3.766	3.765	3.765	3.763	0.136
D 55 13C8_PFOSA	3.844	3.843	3.843	3.845	3.827	3.843	3.843	3.844	3.843	3.843	3.842	0.143
19 PFOSA	3.853	3.843	3.843	3.845	3.835	3.843	3.843	3.844	3.843	3.843	3.843	0.111

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.902	3.901	3.901	3.902	3.884	3.901	3.901	3.902	3.901	3.901	3.899	0.133
3 8:2 FTS	3.894	3.909	3.901	3.910	3.892	3.901	3.901	3.902	3.901	3.901	3.901	0.146
D 65 13C2_8:2 FTS_2	3.910	3.909	3.901	3.902	3.892	3.901	3.901	3.910	3.901	3.901	3.902	0.144
10 PFDA	3.918	3.909	3.909	3.910	3.901	3.909	3.909	3.910	3.909	3.909	3.909	0.110
D 51 13C6_PFDA	3.910	3.909	3.909	3.910	3.901	3.909	3.909	3.910	3.909	3.909	3.908	0.074
* 37 13C2_PFDA	3.910	3.909	3.917	3.910	3.901	3.909	3.909	3.910	3.909	3.909	3.909	0.104
D 58 d3-MeFOSAA	4.069	4.076	4.067	4.068	4.057	4.067	4.067	4.069	4.066	4.067	4.067	0.109
6 N-MeFOSAA	4.078	4.076	4.076	4.068	4.057	4.075	4.075	4.069	4.075	4.067	4.071	0.156
9 PFDS	4.204	4.211	4.211	4.203	4.191	4.201	4.201	4.204	4.201	4.201	4.202	0.128
D 60 d5-EtFOSAA	4.225	4.232	4.232	4.234	4.211	4.221	4.221	4.225	4.231	4.232	4.226	0.170
D 52 13C7_PFUdA	4.225	4.232	4.221	4.224	4.211	4.221	4.221	4.225	4.221	4.221	4.222	0.122
5 N-EtFOSAA	4.235	4.232	4.232	4.234	4.221	4.231	4.231	4.235	4.231	4.232	4.231	0.096
25 PFUdA	4.235	4.232	4.232	4.224	4.221	4.221	4.221	4.225	4.221	4.221	4.225	0.131
D 61 d7-MeFOSE	4.275	4.272	4.272	4.274	4.262	4.272	4.272	4.275	4.272	4.272	4.271	0.093
32 MeFOSE	4.296	4.292	4.282	4.284	4.272	4.282	4.282	4.286	4.282	4.282	4.284	0.151
D 57 d3-MeFOSA	4.296	4.292	4.292	4.295	4.282	4.292	4.292	4.296	4.292	4.292	4.292	0.093
26 MeFOSA	4.306	4.302	4.302	4.295	4.292	4.302	4.302	4.296	4.302	4.302	4.300	0.107
31 11Cl-PF3OUDS	4.365	4.370	4.370	4.372	4.361	4.370	4.370	4.373	4.361	4.370	4.367	0.104
D 62 d9-EtFOSE	4.444	4.441	4.441	4.443	4.432	4.441	4.441	4.444	4.441	4.441	4.440	0.071
33 EtFOSE	4.453	4.450	4.459	4.461	4.450	4.450	4.459	4.452	4.450	4.459	4.454	0.096
D 59 d5-EtFOSA	4.462	4.459	4.459	4.461	4.459	4.459	4.459	4.461	4.459	4.468	4.460	0.058
27 EtFOSA	4.471	4.468	4.468	4.470	4.459	4.468	4.468	4.470	4.468	4.468	4.467	0.070
D 38 13C2_PFDoA	4.507	4.504	4.503	4.506	4.495	4.495	4.504	4.497	4.495	4.503	4.501	0.102
11 PFDoA	4.507	4.504	4.503	4.506	4.495	4.504	4.504	4.497	4.495	4.503	4.502	0.094
4 10:2 FTS	4.507	4.513	4.512	4.506	4.504	4.513	4.513	4.515	4.504	4.512	4.510	0.100
34 PFDOS	4.720	4.712	4.718	4.719	4.711	4.718	4.718	4.720	4.718	4.718	4.717	0.068
24 PFTrDA	4.747	4.746	4.745	4.746	4.738	4.738	4.745	4.747	4.738	4.745	4.743	0.078
D 42 13C2_PFTeDA	4.965	4.964	4.964	4.965	4.956	4.964	4.964	4.965	4.964	4.971	4.964	0.073
23 PFTeDA	4.965	4.964	4.964	4.965	4.956	4.964	4.971	4.965	4.964	4.971	4.965	0.085
35 PFHxDA	5.370	5.360	5.360	5.361	5.351	5.360	5.360	5.361	5.360	5.360	5.360	0.080
D 40 13C2_PFHxDA	5.361	5.360	5.360	5.361	5.351	5.360	5.360	5.361	5.360	5.360	5.359	0.053
36 PFODA	5.746	5.745	5.744	5.738	5.737	5.737	5.737	5.738	5.737	5.744	5.740	0.063

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521017.d
Injection Date: 05-Aug-2021 15:00:44 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC-1590 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	508.95	101.8	70 - 130
D 46 13C4_PFBA	574801	584519			101.7	50 - 150
D 50 13C5_PFPeA	538043	540558			100.5	50 - 150
21 PFPeA			500.00	505.52	101.1	70 - 130
7 PFBS			442.50	445.92	100.8	70 - 130
D 44 13C3_PFBS	187099	194897			104.2	50 - 150
1 4:2 FTS			467.50	478.92	102.4	70 - 130
D 63 13C2_4:2 FTS_2	103169	103808			100.6	50 - 150
D 49 13C5_PFHxA	593317	613342			103.4	50 - 150
15 PFHxA			500.00	507.37	101.5	70 - 130
22 PFPeS			470.00	456.95	97.2	70 - 130
28 GenX			2500.00	2543.58	101.7	70 - 130
D 66 13C3_GenX	1107213	1104532			99.8	50 - 150
D 47 13C4_PFHpA	479053	501669			104.7	50 - 150
13 PFHpA			500.00	496.57	99.3	70 - 130
D 45 13C3_PFHxS	139557	143853			103.1	50 - 150
14 PFHxS			456.00	437.87	96	70 - 130
29 ADONA			2355.00	2337.45	99.3	70 - 130
D 64 13C2_6:2 FTS_2	86994	83231			95.7	50 - 150
2 6:2 FTS			475.00	471.45	99.3	70 - 130
D 53 13C8_PFOA	486725	471107			96.8	50 - 150
20 PFOA			500.00	548.79	109.8	70 - 130
12 PFHpS			475.00	463.32	97.5	70 - 130
18 PFOS			462.75	485.70	105	70 - 130
D 54 13C8_PFOS	130612	135578			103.8	50 - 150
17 PFNA			500.00	510.05	102	70 - 130
D 56 13C9_PFNA	580651	607340			104.6	50 - 150
30 9Cl-PF3ONS			2330.00	2269.04	97.4	70 - 130
D 55 13C8_PFOSA	268160	282766			105.4	50 - 150
19 PFOSA			500.00	474.64	94.9	70 - 130
16 PFNS			480.00	508.95	106	70 - 130
D 65 13C2_8:2 FTS_2	97398	95446			98	50 - 150
3 8:2 FTS			480.00	515.63	107.4	70 - 130
10 PFDA			500.00	495.47	99.1	70 - 130
D 51 13C6_PFDA	542953	542834			100	50 - 150
6 N-MeFOSAA			500.00	609.36	121.9	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	671124			112.5	50 - 150
9 PFDS			482.50	530.30	109.9	70 - 130
D 60 d5-EtFOSAA	592804	626242			105.6	50 - 150
D 52 13C7_PFUdA	631526	651171			103.1	50 - 150
5 N-EtFOSAA			500.00	548.52	109.7	70 - 130
25 PFUdA			500.00	492.70	98.5	70 - 130
D 61 d7-MeFOSE	89085	84985			95.4	50 - 150
D 57 d3-MeFOSA	50589	45816			90.6	50 - 150
31 11Cl-PF3OUDS			2355.00	2329.77	98.9	70 - 130
D 62 d9-EtFOSE	90529	99587			110	50 - 150
D 59 d5-EtFOSA	43442	49688			114.4	50 - 150
11 PFDoA			500.00	539.25	107.8	70 - 130
D 38 13C2_PFDoA	595792	611700			102.7	50 - 150
4 10:2 FTS			2410.00	2521.55	104.6	70 - 130
24 PFTrDA			500.00	528.71	105.7	70 - 130
23 PFTeDA			500.00	549.35	109.9	70 - 130
D 42 13C2_PFTeDA	902749	914773			101.3	50 - 150
D 40 13C2_PFHxDA	845704	919211			108.7	50 - 150

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121005.d
Injection Date: 31-Jul-2021 12:43:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	630797			112	50 - 150
8 PFBA			100.00	105.43	105.4	70 - 130
D 50 13C5_PFPeA	523546	580611			110.9	50 - 150
21 PFPeA			100.00	101.93	101.9	70 - 130
7 PFBS			88.400	93.544	105.8	70 - 130
D 44 13C3_PFBS	169277	180931			106.9	50 - 150
D 63 13C2_4:2 FTS_2	90196	109162			121	50 - 150
1 4:2 FTS			93.400	100.26	107.3	70 - 130
D 49 13C5_PFHxA	600114	669846			111.6	50 - 150
15 PFHxA			100.00	96.354	96.4	70 - 130
22 PFPeS			93.800	90.054	96	70 - 130
28 GenX			200.00	203.51	101.8	70 - 130
D 66 13C3_GenX	1000599	1263013			126.2	50 - 150
D 47 13C4_PFHpA	482787	541026			112.1	50 - 150
13 PFHpA			100.00	87.538	87.5	70 - 130
D 45 13C3_PFHxS	137682	147645			107.2	50 - 150
14 PFHxS			91.000	89.117	97.9	70 - 130
29 ADONA			94.200	101.70	108	70 - 130
D 64 13C2_6:2 FTS_2	77321	93519			120.9	50 - 150
2 6:2 FTS			94.800	149.89	158.1	70 - 130
20 PFOA			100.00	105.94	105.9	70 - 130
D 53 13C8_PFOA	538966	508929			94.4	50 - 150
12 PFHpS			95.200	93.607	98.3	70 - 130
18 PFOS			92.800	87.659	94.5	70 - 130
D 54 13C8_PFOS	139992	147774			105.6	50 - 150
17 PFNA			100.00	112.18	112.2	70 - 130
D 56 13C9_PFNA	618881	632796			102.2	50 - 150
30 9Cl-PF3ONS			93.200	98.786	106	70 - 130
D 55 13C8_PFOSA	250019	286703			114.7	50 - 150
19 PFOSA			100.00	97.563	97.6	70 - 130
16 PFNS			96.000	105.17	109.5	70 - 130
D 65 13C2_8:2 FTS_2	72182	108532			150.4	50 - 150
10 PFDA			100.00	105.97	106	70 - 130
3 8:2 FTS			95.800	92.775	96.8	70 - 130
D 51 13C6_PFDA	590501	617850			104.6	50 - 150
D 58 d3-MeFOSAA	601725	638732			106.2	50 - 150

Report Date: 03-Aug-2021 19:53:30 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	85.626	85.6	70 - 130
9 PFDS			96.400	86.604	89.8	70 - 130
D 52 13C7_PFUdA	707587	671685			94.9	50 - 150
25 PFUdA			100.00	110.97	111	70 - 130
D 60 d5-EtFOSAA	521292	592168			113.6	50 - 150
5 N-EtFOSAA			100.00	76.888	76.9	70 - 130
D 61 d7-MeFOSE	68295	90941			133.2	50 - 150
32 MeFOSE			100.00	98.929	98.9	70 - 130
D 57 d3-MeFOSA	40777	54238			133	50 - 150
26 MeFOSA			100.00	97.800	97.8	70 - 130
31 11Cl-PF3OUDS			94.200	91.365	97	70 - 130
D 62 d9-EtFOSE	68452	95057			138.9	50 - 150
33 EtFOSE			100.00	105.77	105.8	70 - 130
D 59 d5-EtFOSA	38025	51944			136.6	50 - 150
27 EtFOSA			100.00	75.489	75.5	70 - 130
11 PFDoA			100.00	106.68	106.7	70 - 130
D 38 13C2_PFDoA	745164	650962			87.4	50 - 150
4 10:2 FTS			96.400	53.883	55.9	70 - 130
34 PFDOS			96.800	96.142	99.3	70 - 130
24 PFTrDA			100.00	109.95	109.9	70 - 130
23 PFTeDA			100.00	102.52	102.5	70 - 130
D 42 13C2_PFTeDA	846373	953398			112.6	50 - 150
D 40 13C2_PFHxDA	768834	904421			117.6	50 - 150
35 PFHxDA			100.00	121.31	121.3	70 - 130
36 PFODA			100.00	107.65	107.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121006.d
Injection Date: 31-Jul-2021 12:54:21 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	619099			98.1	50 - 150
8 PFBA			200.00	205.22	102.6	70 - 130
D 50 13C5_PFPeA	580611	618368			106.5	50 - 150
21 PFPeA			200.00	200.63	100.3	70 - 130
7 PFBS			176.80	185.02	104.7	70 - 130
D 44 13C3_PFBS	180931	183664			101.5	50 - 150
D 63 13C2_4:2 FTS_2	109162	113013			103.5	50 - 150
1 4:2 FTS			186.80	205.73	110.1	70 - 130
D 49 13C5_PFHxA	669846	637596			95.2	50 - 150
15 PFHxA			200.00	213.37	106.7	70 - 130
22 PFPeS			187.60	173.52	92.5	70 - 130
28 GenX			400.00	400.98	100.2	70 - 130
D 66 13C3_GenX	1263013	1201115			95.1	50 - 150
D 47 13C4_PFHpA	541026	551602			102	50 - 150
13 PFHpA			200.00	200.43	100.2	70 - 130
D 45 13C3_PFHxS	147645	151769			102.8	50 - 150
14 PFHxS			182.00	187.67	103.1	70 - 130
29 ADONA			188.40	192.00	101.9	70 - 130
D 64 13C2_6:2 FTS_2	93519	94950			101.5	50 - 150
2 6:2 FTS			189.60	204.83	108	70 - 130
20 PFOA			200.00	220.04	110	70 - 130
D 53 13C8_PFOA	508929	518622			101.9	50 - 150
12 PFHpS			190.40	184.80	97.1	70 - 130
18 PFOS			185.60	190.07	102.4	70 - 130
D 54 13C8_PFOS	147774	148532			100.5	50 - 150
17 PFNA			200.00	202.95	101.5	70 - 130
D 56 13C9_PFNA	632796	685491			108.3	50 - 150
30 9Cl-PF3ONS			186.40	172.17	92.4	70 - 130
D 55 13C8_PFOSA	286703	311015			108.5	50 - 150
19 PFOSA			200.00	188.73	94.4	70 - 130
16 PFNS			192.00	228.92	119.2	70 - 130
D 65 13C2_8:2 FTS_2	108532	106801			98.4	50 - 150
10 PFDA			200.00	204.16	102.1	70 - 130
3 8:2 FTS			191.60	168.90	88.1	70 - 130
D 51 13C6_PFDA	617850	613585			99.3	50 - 150
D 58 d3-MeFOSAA	638732	634434			99.3	50 - 150

Report Date: 03-Aug-2021 19:53:31 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	216.47	108.2	70 - 130
9 PFDS			192.80	193.32	100.3	70 - 130
D 52 13C7_PFUdA	671685	676160			100.7	50 - 150
25 PFUdA			200.00	217.55	108.8	70 - 130
D 60 d5-EtFOSAA	592168	647982			109.4	50 - 150
5 N-EtFOSAA			200.00	165.56	82.8	70 - 130
D 61 d7-MeFOSE	90941	85494			94	50 - 150
32 MeFOSE			200.00	202.87	101.4	70 - 130
D 57 d3-MeFOSA	54238	49825			91.9	50 - 150
26 MeFOSA			200.00	261.95	131	70 - 130
31 11Cl-PF3OUDS			188.40	186.11	98.8	70 - 130
D 62 d9-EtFOSE	95057	98725			103.9	50 - 150
33 EtFOSE			200.00	171.63	85.8	70 - 130
D 59 d5-EtFOSA	51944	48708			93.8	50 - 150
27 EtFOSA			200.00	210.35	105.2	70 - 130
11 PFDoA			200.00	195.63	97.8	70 - 130
D 38 13C2_PFDoA	650962	701514			107.8	50 - 150
4 10:2 FTS			192.80	110.61	57.4	70 - 130
34 PFDOS			193.60	201.90	104.3	70 - 130
24 PFTrDA			200.00	212.32	106.2	70 - 130
23 PFTeDA			200.00	200.05	100	70 - 130
D 42 13C2_PFTeDA	953398	949684			99.6	50 - 150
D 40 13C2_PFHxDA	904421	927933			102.6	50 - 150
35 PFHxDA			200.00	214.64	107.3	70 - 130
36 PFODA			200.00	207.85	103.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121022.d
Injection Date: 31-Jul-2021 15:44:21 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 15
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	630973			100	50 - 150
8 PFBA			1000.00	936.95	93.7	70 - 130
D 50 13C5_PFPeA	580611	592809			102.1	50 - 150
21 PFPeA			1000.00	916.31	91.6	70 - 130
7 PFBS			884.00	816.31	92.3	70 - 130
D 44 13C3_PFBS	180931	175276			96.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	100278			91.9	50 - 150
1 4:2 FTS			934.00	937.36	100.4	70 - 130
D 49 13C5_PFHxA	669846	649347			96.9	50 - 150
15 PFHxA			1000.00	919.28	91.9	70 - 130
22 PFPeS			938.00	888.80	94.8	70 - 130
28 GenX			2000.00	2016.60	100.8	70 - 130
D 66 13C3_GenX	1263013	1083830			85.8	50 - 150
D 47 13C4_PFHpA	541026	572100			105.7	50 - 150
13 PFHpA			1000.00	872.65	87.3	70 - 130
D 45 13C3_PFHxS	147645	150185			101.7	50 - 150
14 PFHxS			910.00	885.58	97.3	70 - 130
29 ADONA			942.00	906.93	96.3	70 - 130
D 64 13C2_6:2 FTS_2	93519	88211			94.3	50 - 150
2 6:2 FTS			948.00	964.75	101.8	70 - 130
20 PFOA			1000.00	953.99	95.4	70 - 130
D 53 13C8_PFOA	508929	520145			102.2	50 - 150
12 PFHpS			952.00	856.88	90	70 - 130
18 PFOS			928.00	805.03	86.7	70 - 130
D 54 13C8_PFOS	147774	162770			110.1	50 - 150
17 PFNA			1000.00	888.34	88.8	70 - 130
D 56 13C9_PFNA	632796	671445			106.1	50 - 150
30 9Cl-PF3ONS			932.00	784.93	84.2	70 - 130
D 55 13C8_PFOSA	286703	282327			98.5	50 - 150
19 PFOSA			1000.00	988.67	98.9	70 - 130
16 PFNS			960.00	830.65	86.5	70 - 130
D 65 13C2_8:2 FTS_2	108532	100566			92.7	50 - 150
10 PFDA			1000.00	972.27	97.2	70 - 130
3 8:2 FTS			958.00	923.73	96.4	70 - 130
D 51 13C6_PFDA	617850	591496			95.7	50 - 150
D 58 d3-MeFOSAA	638732	594065			93	50 - 150

Report Date: 03-Aug-2021 19:53:39 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121022.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1031.61	103.2	70 - 130
9 PFDS			964.00	832.38	86.3	70 - 130
D 52 13C7_PFUdA	671685	650908			96.9	50 - 150
25 PFUdA			1000.00	935.26	93.5	70 - 130
D 60 d5-EtFOSAA	592168	571978			96.6	50 - 150
5 N-EtFOSAA			1000.00	910.60	91.1	70 - 130
D 61 d7-MeFOSE	90941	87272			96	50 - 150
32 MeFOSE			1000.00	913.52	91.4	70 - 130
D 57 d3-MeFOSA	54238	46582			85.9	50 - 150
26 MeFOSA			1000.00	1247.55	124.8	70 - 130
31 11Cl-PF3OUDS			942.00	776.58	82.4	70 - 130
D 62 d9-EtFOSE	95057	96999			102	50 - 150
33 EtFOSE			1000.00	888.15	88.8	70 - 130
D 59 d5-EtFOSA	51944	45661			87.9	50 - 150
27 EtFOSA			1000.00	1028.63	102.9	70 - 130
11 PFDoA			1000.00	939.83	94	70 - 130
D 38 13C2_PFDoA	650962	656771			100.9	50 - 150
4 10:2 FTS			964.00	620.37	64.4	70 - 130
34 PFDOS			968.00	858.94	88.7	70 - 130
24 PFTrDA			1000.00	1081.08	108.1	70 - 130
23 PFTeDA			1000.00	954.48	95.4	70 - 130
D 42 13C2_PFTeDA	953398	963862			101.1	50 - 150
D 40 13C2_PFHxDA	904421	840486			92.9	50 - 150
35 PFHxDA			1000.00	1061.54	106.2	70 - 130
36 PFODA			1000.00	1031.99	103.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121038.d
Injection Date: 31-Jul-2021 18:34:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	661563			104.9	50 - 150
8 PFBA			1000.00	912.07	91.2	70 - 130
D 50 13C5_PFPeA	580611	625866			107.8	50 - 150
21 PFPeA			1000.00	882.34	88.2	70 - 130
7 PFBS			884.00	837.32	94.7	70 - 130
D 44 13C3_PFBS	180931	186339			103	50 - 150
D 63 13C2_4:2 FTS_2	109162	102087			93.5	50 - 150
1 4:2 FTS			934.00	983.44	105.3	70 - 130
D 49 13C5_PFHxA	669846	710604			106.1	50 - 150
15 PFHxA			1000.00	860.82	86.1	70 - 130
22 PFPeS			938.00	900.57	96	70 - 130
28 GenX			2000.00	1996.46	99.8	70 - 130
D 66 13C3_GenX	1263013	1108881			87.8	50 - 150
D 47 13C4_PFHpA	541026	562782			104	50 - 150
13 PFHpA			1000.00	922.12	92.2	70 - 130
D 45 13C3_PFHxS	147645	161712			109.5	50 - 150
14 PFHxS			910.00	819.06	90	70 - 130
29 ADONA			942.00	886.02	94.1	70 - 130
D 64 13C2_6:2 FTS_2	93519	84286			90.1	50 - 150
2 6:2 FTS			948.00	1013.53	106.9	70 - 130
20 PFOA			1000.00	927.95	92.8	70 - 130
D 53 13C8_PFOA	508929	546469			107.4	50 - 150
12 PFHpS			952.00	880.02	92.4	70 - 130
18 PFOS			928.00	867.63	93.5	70 - 130
D 54 13C8_PFOS	147774	157144			106.3	50 - 150
17 PFNA			1000.00	921.91	92.2	70 - 130
D 56 13C9_PFNA	632796	688784			108.8	50 - 150
30 9Cl-PF3ONS			932.00	908.05	97.4	70 - 130
D 55 13C8_PFOSA	286703	286613			100	50 - 150
19 PFOSA			1000.00	1008.82	100.9	70 - 130
16 PFNS			960.00	874.86	91.1	70 - 130
D 65 13C2_8:2 FTS_2	108532	112533			103.7	50 - 150
10 PFDA			1000.00	948.99	94.9	70 - 130
3 8:2 FTS			958.00	759.96	79.3	70 - 130
D 51 13C6_PFDA	617850	680491			110.1	50 - 150
D 58 d3-MeFOSAA	638732	643641			100.8	50 - 150

Report Date: 03-Aug-2021 19:53:49 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121038.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1083.23	108.3	70 - 130
9 PFDS			964.00	901.61	93.5	70 - 130
D 52 13C7_PFUdA	671685	709590			105.6	50 - 150
25 PFUdA			1000.00	994.30	99.4	70 - 130
D 60 d5-EtFOSAA	592168	605884			102.3	50 - 150
5 N-EtFOSAA			1000.00	968.89	96.9	70 - 130
D 61 d7-MeFOSE	90941	89425			98.3	50 - 150
32 MeFOSE			1000.00	963.18	96.3	70 - 130
D 57 d3-MeFOSA	54238	54577			100.6	50 - 150
26 MeFOSA			1000.00	1186.25	118.6	70 - 130
31 11Cl-PF3OUDS			942.00	863.86	91.7	70 - 130
D 62 d9-EtFOSE	95057	104249			109.7	50 - 150
33 EtFOSE			1000.00	899.77	90	70 - 130
D 59 d5-EtFOSA	51944	49490			95.3	50 - 150
27 EtFOSA			1000.00	997.76	99.8	70 - 130
11 PFDoA			1000.00	949.68	95	70 - 130
D 38 13C2_PFDoA	650962	684192			105.1	50 - 150
4 10:2 FTS			964.00	576.79	59.8	70 - 130
34 PFDOS			968.00	948.96	98	70 - 130
24 PFTrDA			1000.00	1071.77	107.2	70 - 130
23 PFTeDA			1000.00	895.99	89.6	70 - 130
D 42 13C2_PFTeDA	953398	1069874			112.2	50 - 150
D 40 13C2_PFHxDA	904421	877595			97	50 - 150
35 PFHxDA			1000.00	1052.77	105.3	70 - 130
36 PFODA			1000.00	1029.79	103	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121052.d
Injection Date: 31-Jul-2021 21:03:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 45
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	623063			98.8	50 - 150
8 PFBA			1000.00	938.76	93.9	70 - 130
D 50 13C5_PFPeA	580611	601785			103.6	50 - 150
21 PFPeA			1000.00	883.31	88.3	70 - 130
7 PFBS			884.00	818.38	92.6	70 - 130
D 44 13C3_PFBS	180931	177055			97.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	98533			90.3	50 - 150
1 4:2 FTS			934.00	898.37	96.2	70 - 130
D 49 13C5_PFHxA	669846	656607			98	50 - 150
15 PFHxA			1000.00	953.73	95.4	70 - 130
22 PFPeS			938.00	874.58	93.2	70 - 130
28 GenX			2000.00	1872.71	93.6	70 - 130
D 66 13C3_GenX	1263013	1120587			88.7	50 - 150
D 47 13C4_PFHpA	541026	554336			102.5	50 - 150
13 PFHpA			1000.00	857.30	85.7	70 - 130
D 45 13C3_PFHxS	147645	151993			102.9	50 - 150
14 PFHxS			910.00	824.27	90.6	70 - 130
29 ADONA			942.00	882.86	93.7	70 - 130
D 64 13C2_6:2 FTS_2	93519	85319			91.2	50 - 150
2 6:2 FTS			948.00	1038.91	109.6	70 - 130
20 PFOA			1000.00	971.27	97.1	70 - 130
D 53 13C8_PFOA	508929	520093			102.2	50 - 150
12 PFHpS			952.00	875.94	92	70 - 130
18 PFOS			928.00	937.47	101	70 - 130
D 54 13C8_PFOS	147774	144303			97.7	50 - 150
17 PFNA			1000.00	901.63	90.2	70 - 130
D 56 13C9_PFNA	632796	679562			107.4	50 - 150
30 9Cl-PF3ONS			932.00	926.44	99.4	70 - 130
D 55 13C8_PFOSA	286703	285565			99.6	50 - 150
19 PFOSA			1000.00	992.08	99.2	70 - 130
16 PFNS			960.00	945.32	98.5	70 - 130
D 65 13C2_8:2 FTS_2	108532	101289			93.3	50 - 150
10 PFDA			1000.00	944.01	94.4	70 - 130
3 8:2 FTS			958.00	820.56	85.7	70 - 130
D 51 13C6_PFDA	617850	603695			97.7	50 - 150
D 58 d3-MeFOSAA	638732	632027			99	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1022.68	102.3	70 - 130
9 PFDS			964.00	1010.99	104.9	70 - 130
D 52 13C7_PFUdA	671685	663294			98.8	50 - 150
25 PFUdA			1000.00	932.33	93.2	70 - 130
D 60 d5-EtFOSAA	592168	563082			95.1	50 - 150
5 N-EtFOSAA			1000.00	1036.26	103.6	70 - 130
D 61 d7-MeFOSE	90941	83760			92.1	50 - 150
32 MeFOSE			1000.00	944.12	94.4	70 - 130
D 57 d3-MeFOSA	54238	51039			94.1	50 - 150
26 MeFOSA			1000.00	1059.77	106	70 - 130
31 11Cl-PF3OUDS			942.00	854.23	90.7	70 - 130
D 62 d9-EtFOSE	95057	97268			102.3	50 - 150
33 EtFOSE			1000.00	918.90	91.9	70 - 130
D 59 d5-EtFOSA	51944	44439			85.6	50 - 150
27 EtFOSA			1000.00	1110.29	111	70 - 130
11 PFDoA			1000.00	989.17	98.9	70 - 130
D 38 13C2_PFDoA	650962	622140			95.6	50 - 150
4 10:2 FTS			964.00	565.46	58.7	70 - 130
34 PFDOS			968.00	948.32	98	70 - 130
24 PFTrDA			1000.00	1145.24	114.5	70 - 130
23 PFTeDA			1000.00	928.19	92.8	70 - 130
D 42 13C2_PFTeDA	953398	938135			98.4	50 - 150
D 40 13C2_PFHxDA	904421	856460			94.7	50 - 150
35 PFHxDA			1000.00	1051.03	105.1	70 - 130
36 PFODA			1000.00	1011.31	101.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121064.d
Injection Date: 31-Jul-2021 23:11:23 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 57
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	659616			104.6	50 - 150
8 PFBA			1000.00	955.95	95.6	70 - 130
D 50 13C5_PFPeA	580611	641109			110.4	50 - 150
21 PFPeA			1000.00	932.10	93.2	70 - 130
7 PFBS			884.00	809.60	91.6	70 - 130
D 44 13C3_PFBS	180931	195271			107.9	50 - 150
D 63 13C2_4:2 FTS_2	109162	100302			91.9	50 - 150
1 4:2 FTS			934.00	1002.23	107.3	70 - 130
D 49 13C5_PFHxA	669846	723344			108	50 - 150
15 PFHxA			1000.00	853.19	85.3	70 - 130
22 PFPeS			938.00	850.70	90.7	70 - 130
28 GenX			2000.00	2016.37	100.8	70 - 130
D 66 13C3_GenX	1263013	1184450			93.8	50 - 150
D 47 13C4_PFHpA	541026	594092			109.8	50 - 150
13 PFHpA			1000.00	845.60	84.6	70 - 130
D 45 13C3_PFHxS	147645	167862			113.7	50 - 150
14 PFHxS			910.00	806.56	88.6	70 - 130
29 ADONA			942.00	871.73	92.5	70 - 130
D 64 13C2_6:2 FTS_2	93519	90904			97.2	50 - 150
2 6:2 FTS			948.00	979.31	103.3	70 - 130
20 PFOA			1000.00	1014.23	101.4	70 - 130
D 53 13C8_PFOA	508929	549893			108	50 - 150
12 PFHpS			952.00	878.71	92.3	70 - 130
18 PFOS			928.00	867.09	93.4	70 - 130
D 54 13C8_PFOS	147774	166585			112.7	50 - 150
17 PFNA			1000.00	907.59	90.8	70 - 130
D 56 13C9_PFNA	632796	734455			116.1	50 - 150
30 9Cl-PF3ONS			932.00	815.24	87.5	70 - 130
D 55 13C8_PFOSA	286703	306730			107	50 - 150
19 PFOSA			1000.00	1005.87	100.6	70 - 130
16 PFNS			960.00	845.70	88.1	70 - 130
D 65 13C2_8:2 FTS_2	108532	104122			95.9	50 - 150
10 PFDA			1000.00	847.68	84.8	70 - 130
3 8:2 FTS			958.00	952.38	99.4	70 - 130
D 51 13C6_PFDA	617850	718232			116.2	50 - 150
D 58 d3-MeFOSAA	638732	631226			98.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1055.69	105.6	70 - 130
9 PFDS			964.00	858.33	89	70 - 130
D 52 13C7_PFUdA	671685	754230			112.3	50 - 150
25 PFUdA			1000.00	939.78	94	70 - 130
D 60 d5-EtFOSAA	592168	598063			101	50 - 150
5 N-EtFOSAA			1000.00	1001.42	100.1	70 - 130
D 61 d7-MeFOSE	90941	83481			91.8	50 - 150
32 MeFOSE			1000.00	1036.03	103.6	70 - 130
D 57 d3-MeFOSA	54238	50069			92.3	50 - 150
26 MeFOSA			1000.00	1174.79	117.5	70 - 130
31 11Cl-PF3OUDS			942.00	865.35	91.9	70 - 130
D 62 d9-EtFOSE	95057	104693			110.1	50 - 150
33 EtFOSE			1000.00	867.32	86.7	70 - 130
D 59 d5-EtFOSA	51944	52139			100.4	50 - 150
27 EtFOSA			1000.00	1066.76	106.7	70 - 130
11 PFDoA			1000.00	1017.09	101.7	70 - 130
D 38 13C2_PFDoA	650962	699334			107.4	50 - 150
4 10:2 FTS			964.00	725.40	75.2	70 - 130
34 PFDOS			968.00	895.15	92.5	70 - 130
24 PFTrDA			1000.00	1104.07	110.4	70 - 130
23 PFTeDA			1000.00	856.59	85.7	70 - 130
D 42 13C2_PFTeDA	953398	1131177			118.6	50 - 150
D 40 13C2_PFHxDA	904421	943368			104.3	50 - 150
35 PFHxDA			1000.00	1085.13	108.5	70 - 130
36 PFODA			1000.00	1024.25	102.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121072.d
Injection Date: 01-Aug-2021 00:36:49 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 65
Sample Info: ID CCV 1000D_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	630797	685378			108.7	50 - 150
8 PFBA			1000.00	926.89	92.7	70 - 130
D 50 13C5_PFPeA	580611	650218			112	50 - 150
21 PFPeA			1000.00	879.27	87.9	70 - 130
7 PFBS			884.00	783.26	88.6	70 - 130
D 44 13C3_PFBS	180931	205782			113.7	50 - 150
D 63 13C2_4:2 FTS_2	109162	99884			91.5	50 - 150
1 4:2 FTS			934.00	1062.33	113.7	70 - 130
D 49 13C5_PFHxA	669846	746812			111.5	50 - 150
15 PFHxA			1000.00	854.67	85.5	70 - 130
22 PFPeS			938.00	754.46	80.4	70 - 130
28 GenX			2000.00	2018.65	100.9	70 - 130
D 66 13C3_GenX	1263013	1208923			95.7	50 - 150
D 47 13C4_PFHpA	541026	590171			109.1	50 - 150
13 PFHpA			1000.00	939.31	93.9	70 - 130
D 45 13C3_PFHxS	147645	174499			118.2	50 - 150
14 PFHxS			910.00	779.90	85.7	70 - 130
29 ADONA			942.00	846.07	89.8	70 - 130
D 64 13C2_6:2 FTS_2	93519	96789			103.5	50 - 150
2 6:2 FTS			948.00	1035.28	109.2	70 - 130
20 PFOA			1000.00	970.89	97.1	70 - 130
D 53 13C8_PFOA	508929	564751			111	50 - 150
12 PFHpS			952.00	816.79	85.8	70 - 130
18 PFOS			928.00	857.78	92.4	70 - 130
D 54 13C8_PFOS	147774	162659			110.1	50 - 150
17 PFNA			1000.00	950.29	95	70 - 130
D 56 13C9_PFNA	632796	704499			111.3	50 - 150
30 9Cl-PF3ONS			932.00	846.36	90.8	70 - 130
D 55 13C8_PFOSA	286703	291887			101.8	50 - 150
19 PFOSA			1000.00	1025.10	102.5	70 - 130
16 PFNS			960.00	877.73	91.4	70 - 130
D 65 13C2_8:2 FTS_2	108532	109938			101.3	50 - 150
10 PFDA			1000.00	968.24	96.8	70 - 130
3 8:2 FTS			958.00	923.65	96.4	70 - 130
D 51 13C6_PFDA	617850	661395			107	50 - 150
D 58 d3-MeFOSAA	638732	663613			103.9	50 - 150

Report Date: 03-Aug-2021 19:54:08 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\073121-DOD.b\073121072.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	999.05	99.9	70 - 130
9 PFDS			964.00	1004.42	104.2	70 - 130
D 52 13C7_PFUdA	671685	738423			109.9	50 - 150
25 PFUdA			1000.00	920.43	92	70 - 130
D 60 d5-EtFOSAA	592168	609303			102.9	50 - 150
5 N-EtFOSAA			1000.00	958.67	95.9	70 - 130
D 61 d7-MeFOSE	90941	85167			93.7	50 - 150
32 MeFOSE			1000.00	1023.20	102.3	70 - 130
D 57 d3-MeFOSA	54238	55678			102.7	50 - 150
26 MeFOSA			1000.00	1221.62	122.2	70 - 130
31 11Cl-PF3OUDS			942.00	853.32	90.6	70 - 130
D 62 d9-EtFOSE	95057	112654			118.5	50 - 150
33 EtFOSE			1000.00	871.79	87.2	70 - 130
D 59 d5-EtFOSA	51944	49786			95.8	50 - 150
27 EtFOSA			1000.00	1067.92	106.8	70 - 130
11 PFDoA			1000.00	1041.78	104.2	70 - 130
D 38 13C2_PFDoA	650962	703014			108	50 - 150
4 10:2 FTS			964.00	627.59	65.1	70 - 130
34 PFDOS			968.00	907.38	93.7	70 - 130
24 PFTrDA			1000.00	1090.36	109	70 - 130
23 PFTeDA			1000.00	928.40	92.8	70 - 130
D 42 13C2_PFTeDA	953398	1039288			109	50 - 150
D 40 13C2_PFHxDA	904421	913959			101.1	50 - 150
35 PFHxDA			1000.00	1066.12	106.6	70 - 130
36 PFODA			1000.00	1025.79	102.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421005.d
Injection Date: 04-Aug-2021 12:17:56 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1546 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	563032	627821			111.5	50 - 150
8 PFBA			100.00	106.23	106.2	70 - 130
D 50 13C5_PFPeA	523546	594861			113.6	50 - 150
21 PFPeA			100.00	104.33	104.3	70 - 130
7 PFBS			88.400	79.859	90.3	70 - 130
D 44 13C3_PFBS	169277	191316			113	50 - 150
D 63 13C2_4:2 FTS_2	90196	113853			126.2	50 - 150
1 4:2 FTS			93.400	102.09	109.3	70 - 130
D 49 13C5_PFHxA	600114	699983			116.6	50 - 150
15 PFHxA			100.00	96.520	96.5	70 - 130
22 PFPeS			93.800	92.609	98.7	70 - 130
28 GenX			200.00	234.28	117.1	70 - 130
D 66 13C3_GenX	1000599	1232176			123.1	50 - 150
D 47 13C4_PFHpA	482787	563315			116.7	50 - 150
13 PFHpA			100.00	96.178	96.2	70 - 130
D 45 13C3_PFHxS	137682	162707			118.2	50 - 150
14 PFHxS			91.000	89.810	98.7	70 - 130
29 ADONA			94.200	85.090	90.3	70 - 130
D 64 13C2_6:2 FTS_2	77321	94624			122.4	50 - 150
2 6:2 FTS			94.800	140.21	147.9	70 - 130
20 PFOA			100.00	113.13	113.1	70 - 130
D 53 13C8_PFOA	538966	520722			96.6	50 - 150
12 PFHpS			95.200	83.832	88.1	70 - 130
18 PFOS			92.800	75.514	81.4	70 - 130
D 54 13C8_PFOS	139992	155583			111.1	50 - 150
17 PFNA			100.00	97.418	97.4	70 - 130
D 56 13C9_PFNA	618881	683223			110.4	50 - 150
30 9Cl-PF3ONS			93.200	87.315	93.7	70 - 130
D 55 13C8_PFOSA	250019	335834			134.3	50 - 150
19 PFOSA			100.00	96.022	96	70 - 130
16 PFNS			96.000	88.213	91.9	70 - 130
D 65 13C2_8:2 FTS_2	72182	109751			152	50 - 150
10 PFDA			100.00	100.08	100.1	70 - 130
3 8:2 FTS			95.800	90.853	94.8	70 - 130
D 51 13C6_PFDA	590501	632664			107.1	50 - 150
D 58 d3-MeFOSAA	601725	796771			132.4	50 - 150

Report Date: 05-Aug-2021 18:39:10 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	103.16	103.2	70 - 130
9 PFDS			96.400	90.171	93.5	70 - 130
D 52 13C7_PFUdA	707587	654046			92.4	50 - 150
25 PFUdA			100.00	105.63	105.6	70 - 130
D 60 d5-EtFOSAA	521292	676164			129.7	50 - 150
5 N-EtFOSAA			100.00	103.62	103.6	70 - 130
D 61 d7-MeFOSE	68295	81562			119.4	50 - 150
32 MeFOSE			100.00	107.41	107.4	70 - 130
D 57 d3-MeFOSA	40777	50898			124.8	50 - 150
26 MeFOSA			100.00	135.36	135.4	70 - 130
31 11Cl-PF3OUDS			94.200	86.062	91.4	70 - 130
D 62 d9-EtFOSE	68452	105638			154.3	50 - 150
33 EtFOSE			100.00	112.41	112.4	70 - 130
D 59 d5-EtFOSA	38025	45744			120.3	50 - 150
27 EtFOSA			100.00	87.401	87.4	70 - 130
11 PFDoA			100.00	100.59	100.6	70 - 130
D 38 13C2_PFDoA	745164	722764			97	50 - 150
4 10:2 FTS			96.400	57.971	60.1	70 - 130
34 PFDOS			96.800	104.58	108	70 - 130
24 PFTrDA			100.00	108.49	108.5	70 - 130
23 PFTeDA			100.00	103.92	103.9	70 - 130
D 42 13C2_PFTeDA	846373	1022490			120.8	50 - 150
D 40 13C2_PFHxDA	768834	983864			128	50 - 150
35 PFHxDA			100.00	111.08	111.1	70 - 130
36 PFODA			100.00	102.94	102.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421006.d
Injection Date: 04-Aug-2021 12:28:33 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1547 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	626953			99.9	50 - 150
8 PFBA			200.00	216.75	108.4	70 - 130
D 50 13C5_PFPeA	594861	597098			100.4	50 - 150
21 PFPeA			200.00	196.29	98.1	70 - 130
7 PFBS			176.80	182.10	103	70 - 130
D 44 13C3_PFBS	191316	189948			99.3	50 - 150
D 63 13C2_4:2 FTS_2	113853	121584			106.8	50 - 150
1 4:2 FTS			186.80	168.94	90.4	70 - 130
D 49 13C5_PFHxA	699983	690179			98.6	50 - 150
15 PFHxA			200.00	210.78	105.4	70 - 130
22 PFPeS			187.60	185.49	98.9	70 - 130
28 GenX			400.00	380.34	95.1	70 - 130
D 66 13C3_GenX	1232176	1271693			103.2	50 - 150
D 47 13C4_PFHpA	563315	550332			97.7	50 - 150
13 PFHpA			200.00	180.72	90.4	70 - 130
D 45 13C3_PFHxS	162707	152605			93.8	50 - 150
14 PFHxS			182.00	172.20	94.6	70 - 130
29 ADONA			188.40	196.01	104	70 - 130
D 64 13C2_6:2 FTS_2	94624	99579			105.2	50 - 150
2 6:2 FTS			189.60	224.92	118.6	70 - 130
20 PFOA			200.00	219.57	109.8	70 - 130
D 53 13C8_PFOA	520722	528847			101.6	50 - 150
12 PFHpS			190.40	206.46	108.4	70 - 130
18 PFOS			185.60	185.39	99.9	70 - 130
D 54 13C8_PFOS	155583	152075			97.7	50 - 150
17 PFNA			200.00	205.59	102.8	70 - 130
D 56 13C9_PFNA	683223	675589			98.9	50 - 150
30 9Cl-PF3ONS			186.40	192.68	103.4	70 - 130
D 55 13C8_PFOSA	335834	326589			97.2	50 - 150
19 PFOSA			200.00	200.42	100.2	70 - 130
16 PFNS			192.00	194.28	101.2	70 - 130
D 65 13C2_8:2 FTS_2	109751	110281			100.5	50 - 150
10 PFDA			200.00	218.92	109.5	70 - 130
3 8:2 FTS			191.60	195.89	102.2	70 - 130
D 51 13C6_PFDA	632664	634461			100.3	50 - 150
D 58 d3-MeFOSAA	796771	764302			95.9	50 - 150

Report Date: 05-Aug-2021 18:39:11 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	211.18	105.6	70 - 130
9 PFDS			192.80	181.79	94.3	70 - 130
D 52 13C7_PFUdA	654046	693045			106	50 - 150
25 PFUdA			200.00	196.96	98.5	70 - 130
D 60 d5-EtFOSAA	676164	697660			103.2	50 - 150
5 N-EtFOSAA			200.00	179.38	89.7	70 - 130
D 61 d7-MeFOSE	81562	88988			109.1	50 - 150
32 MeFOSE			200.00	219.72	109.9	70 - 130
D 57 d3-MeFOSA	50898	56608			111.2	50 - 150
26 MeFOSA			200.00	241.39	120.7	70 - 130
31 11Cl-PF3OUDS			188.40	178.57	94.8	70 - 130
D 62 d9-EtFOSE	105638	103567			98	50 - 150
33 EtFOSE			200.00	166.18	83.1	70 - 130
D 59 d5-EtFOSA	45744	46198			101	50 - 150
27 EtFOSA			200.00	223.12	111.6	70 - 130
11 PFDoA			200.00	196.25	98.1	70 - 130
D 38 13C2_PFDoA	722764	717304			99.2	50 - 150
4 10:2 FTS			192.80	118.55	61.5	70 - 130
34 PFDOS			193.60	199.99	103.3	70 - 130
24 PFTrDA			200.00	227.68	113.8	70 - 130
23 PFTeDA			200.00	193.79	96.9	70 - 130
D 42 13C2_PFTeDA	1022490	1043732			102.1	50 - 150
D 40 13C2_PFHxDA	983864	1008178			102.5	50 - 150
35 PFHxDA			200.00	217.28	108.6	70 - 130
36 PFODA			200.00	208.91	104.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421025.d
Injection Date: 04-Aug-2021 15:50:19 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 17
Sample Info: ID CCV 1000_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	674504			107.4	50 - 150
8 PFBA			1000.00	922.26	92.2	70 - 130
D 50 13C5_PFPeA	594861	647586			108.9	50 - 150
21 PFPeA			1000.00	866.77	86.7	70 - 130
7 PFBS			884.00	815.95	92.3	70 - 130
D 44 13C3_PFBS	191316	202893			106.1	50 - 150
D 63 13C2_4:2 FTS_2	113853	116685			102.5	50 - 150
1 4:2 FTS			934.00	1005.49	107.7	70 - 130
D 49 13C5_PFHxA	699983	706835			101	50 - 150
15 PFHxA			1000.00	927.08	92.7	70 - 130
22 PFPeS			938.00	856.28	91.3	70 - 130
28 GenX			2000.00	1819.21	91	70 - 130
D 66 13C3_GenX	1232176	1250182			101.5	50 - 150
D 47 13C4_PFHpA	563315	622469			110.5	50 - 150
13 PFHpA			1000.00	870.85	87.1	70 - 130
D 45 13C3_PFHxS	162707	166597			102.4	50 - 150
14 PFHxS			910.00	858.35	94.3	70 - 130
29 ADONA			942.00	907.07	96.3	70 - 130
D 64 13C2_6:2 FTS_2	94624	90068			95.2	50 - 150
2 6:2 FTS			948.00	1187.45	125.3	70 - 130
20 PFOA			1000.00	931.57	93.2	70 - 130
D 53 13C8_PFOA	520722	563553			108.2	50 - 150
12 PFHpS			952.00	858.86	90.2	70 - 130
18 PFOS			928.00	859.93	92.7	70 - 130
D 54 13C8_PFOS	155583	165152			106.2	50 - 150
17 PFNA			1000.00	946.84	94.7	70 - 130
D 56 13C9_PFNA	683223	695758			101.8	50 - 150
30 9Cl-PF3ONS			932.00	861.47	92.4	70 - 130
D 55 13C8_PFOSA	335834	286082			85.2	50 - 150
19 PFOSA			1000.00	1013.34	101.3	70 - 130
16 PFNS			960.00	836.35	87.1	70 - 130
D 65 13C2_8:2 FTS_2	109751	100974			92	50 - 150
10 PFDA			1000.00	848.20	84.8	70 - 130
3 8:2 FTS			958.00	941.74	98.3	70 - 130
D 51 13C6_PFDA	632664	680660			107.6	50 - 150
D 58 d3-MeFOSAA	796771	745982			93.6	50 - 150

Report Date: 05-Aug-2021 18:39:26 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421025.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1063.75	106.4	70 - 130
9 PFDS			964.00	925.26	96	70 - 130
D 52 13C7_PFUdA	654046	810613			123.9	50 - 150
25 PFUdA			1000.00	832.61	83.3	70 - 130
D 60 d5-EtFOSAA	676164	692730			102.4	50 - 150
5 N-EtFOSAA			1000.00	975.02	97.5	70 - 130
D 61 d7-MeFOSE	81562	87121			106.8	50 - 150
32 MeFOSE			1000.00	1066.14	106.6	70 - 130
D 57 d3-MeFOSA	50898	52628			103.4	50 - 150
26 MeFOSA			1000.00	1094.00	109.4	70 - 130
31 11Cl-PF3OUDS			942.00	878.21	93.2	70 - 130
D 62 d9-EtFOSE	105638	101672			96.2	50 - 150
33 EtFOSE			1000.00	928.90	92.9	70 - 130
D 59 d5-EtFOSA	45744	49479			108.2	50 - 150
27 EtFOSA			1000.00	1000.76	100.1	70 - 130
11 PFDoA			1000.00	900.75	90.1	70 - 130
D 38 13C2_PFDoA	722764	729690			101	50 - 150
4 10:2 FTS			964.00	572.67	59.4	70 - 130
34 PFDOS			968.00	903.23	93.3	70 - 130
24 PFTrDA			1000.00	1031.79	103.2	70 - 130
23 PFTeDA			1000.00	937.97	93.8	70 - 130
D 42 13C2_PFTeDA	1022490	1040010			101.7	50 - 150
D 40 13C2_PFHxDA	983864	952729			96.8	50 - 150
35 PFHxDA			1000.00	1056.29	105.6	70 - 130
36 PFODA			1000.00	1024.08	102.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421039.d
Injection Date: 04-Aug-2021 18:19:17 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	687846			109.6	50 - 150
8 PFBA			1000.00	934.59	93.5	70 - 130
D 50 13C5_PFPeA	594861	663496			111.5	50 - 150
21 PFPeA			1000.00	914.47	91.4	70 - 130
7 PFBS			884.00	774.29	87.6	70 - 130
D 44 13C3_PFBS	191316	216780			113.3	50 - 150
D 63 13C2_4:2 FTS_2	113853	106230			93.3	50 - 150
1 4:2 FTS			934.00	1047.05	112.1	70 - 130
D 49 13C5_PFHxA	699983	771560			110.2	50 - 150
15 PFHxA			1000.00	880.06	88	70 - 130
22 PFPeS			938.00	833.61	88.9	70 - 130
28 GenX			2000.00	1986.83	99.3	70 - 130
D 66 13C3_GenX	1232176	1263846			102.6	50 - 150
D 47 13C4_PFHpA	563315	589510			104.7	50 - 150
13 PFHpA			1000.00	932.60	93.3	70 - 130
D 45 13C3_PFHxS	162707	175846			108.1	50 - 150
14 PFHxS			910.00	817.19	89.8	70 - 130
29 ADONA			942.00	900.75	95.6	70 - 130
D 64 13C2_6:2 FTS_2	94624	92999			98.3	50 - 150
2 6:2 FTS			948.00	1240.51	130.9	70 - 130
20 PFOA			1000.00	935.83	93.6	70 - 130
D 53 13C8_PFOA	520722	598506			114.9	50 - 150
12 PFHpS			952.00	883.11	92.8	70 - 130
18 PFOS			928.00	853.90	92	70 - 130
D 54 13C8_PFOS	155583	178390			114.7	50 - 150
17 PFNA			1000.00	905.56	90.6	70 - 130
D 56 13C9_PFNA	683223	751203			109.9	50 - 150
30 9Cl-PF3ONS			932.00	832.52	89.3	70 - 130
D 55 13C8_PFOSA	335834	332349			99	50 - 150
19 PFOSA			1000.00	971.98	97.2	70 - 130
16 PFNS			960.00	859.17	89.5	70 - 130
D 65 13C2_8:2 FTS_2	109751	109775			100	50 - 150
10 PFDA			1000.00	934.72	93.5	70 - 130
3 8:2 FTS			958.00	1027.31	107.2	70 - 130
D 51 13C6_PFDA	632664	761622			120.4	50 - 150
D 58 d3-MeFOSAA	796771	774583			97.2	50 - 150

Report Date: 05-Aug-2021 18:39:37 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421039.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1111.17	111.1	70 - 130
9 PFDS			964.00	915.02	94.9	70 - 130
D 52 13C7_PFUdA	654046	756488			115.7	50 - 150
25 PFUdA			1000.00	916.96	91.7	70 - 130
D 60 d5-EtFOSAA	676164	711308			105.2	50 - 150
5 N-EtFOSAA			1000.00	1015.07	101.5	70 - 130
D 61 d7-MeFOSE	81562	92288			113.2	50 - 150
32 MeFOSE			1000.00	1053.18	105.3	70 - 130
D 57 d3-MeFOSA	50898	61123			120.1	50 - 150
26 MeFOSA			1000.00	1092.36	109.2	70 - 130
31 11Cl-PF3OUDS			942.00	840.79	89.3	70 - 130
D 62 d9-EtFOSE	105638	101426			96	50 - 150
33 EtFOSE			1000.00	944.82	94.5	70 - 130
D 59 d5-EtFOSA	45744	49405			108	50 - 150
27 EtFOSA			1000.00	1043.38	104.3	70 - 130
11 PFDoA			1000.00	971.20	97.1	70 - 130
D 38 13C2_PFDoA	722764	751320			104	50 - 150
4 10:2 FTS			964.00	576.27	59.8	70 - 130
34 PFDOS			968.00	904.38	93.4	70 - 130
24 PFTrDA			1000.00	1024.17	102.4	70 - 130
23 PFTeDA			1000.00	913.39	91.3	70 - 130
D 42 13C2_PFTeDA	1022490	1127630			110.3	50 - 150
D 40 13C2_PFHxDA	983864	994460			101.1	50 - 150
35 PFHxDA			1000.00	1065.32	106.5	70 - 130
36 PFODA			1000.00	1022.25	102.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421051.d
Injection Date: 04-Aug-2021 20:26:55 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 43
Sample Info: ID CCV 1000B_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	689587			109.8	50 - 150
8 PFBA			1000.00	939.98	94	70 - 130
D 50 13C5_PFPeA	594861	658620			110.7	50 - 150
21 PFPeA			1000.00	874.82	87.5	70 - 130
7 PFBS			884.00	798.87	90.4	70 - 130
D 44 13C3_PFBS	191316	199806			104.4	50 - 150
D 63 13C2_4:2 FTS_2	113853	117507			103.2	50 - 150
1 4:2 FTS			934.00	874.80	93.7	70 - 130
D 49 13C5_PFHxA	699983	736328			105.2	50 - 150
15 PFHxA			1000.00	952.53	95.3	70 - 130
22 PFPeS			938.00	911.25	97.1	70 - 130
28 GenX			2000.00	2050.66	102.5	70 - 130
D 66 13C3_GenX	1232176	1189675			96.6	50 - 150
D 47 13C4_PFHpA	563315	581559			103.2	50 - 150
13 PFHpA			1000.00	912.43	91.2	70 - 130
D 45 13C3_PFHxS	162707	176159			108.3	50 - 150
14 PFHxS			910.00	846.79	93.1	70 - 130
29 ADONA			942.00	887.96	94.3	70 - 130
D 64 13C2_6:2 FTS_2	94624	90899			96.1	50 - 150
2 6:2 FTS			948.00	1228.71	129.6	70 - 130
20 PFOA			1000.00	950.22	95	70 - 130
D 53 13C8_PFOA	520722	594753			114.2	50 - 150
12 PFHpS			952.00	874.31	91.8	70 - 130
18 PFOS			928.00	832.57	89.7	70 - 130
D 54 13C8_PFOS	155583	168974			108.6	50 - 150
17 PFNA			1000.00	900.95	90.1	70 - 130
D 56 13C9_PFNA	683223	741303			108.5	50 - 150
30 9Cl-PF3ONS			932.00	903.14	96.9	70 - 130
D 55 13C8_PFOSA	335834	319166			95	50 - 150
19 PFOSA			1000.00	893.47	89.3	70 - 130
16 PFNS			960.00	896.98	93.4	70 - 130
D 65 13C2_8:2 FTS_2	109751	111620			101.7	50 - 150
10 PFDA			1000.00	933.37	93.3	70 - 130
3 8:2 FTS			958.00	1000.43	104.4	70 - 130
D 51 13C6_PFDA	632664	726213			114.8	50 - 150
D 58 d3-MeFOSAA	796771	768314			96.4	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1103.56	110.4	70 - 130
9 PFDS			964.00	934.16	96.9	70 - 130
D 52 13C7_PFUdA	654046	786576			120.3	50 - 150
25 PFUdA			1000.00	933.69	93.4	70 - 130
D 60 d5-EtFOSAA	676164	763594			112.9	50 - 150
5 N-EtFOSAA			1000.00	970.24	97	70 - 130
D 61 d7-MeFOSE	81562	96830			118.7	50 - 150
32 MeFOSE			1000.00	868.67	86.9	70 - 130
D 57 d3-MeFOSA	50898	52322			102.8	50 - 150
26 MeFOSA			1000.00	1112.65	111.3	70 - 130
31 11Cl-PF3OUDS			942.00	827.48	87.8	70 - 130
D 62 d9-EtFOSE	105638	107175			101.5	50 - 150
33 EtFOSE			1000.00	945.67	94.6	70 - 130
D 59 d5-EtFOSA	45744	47363			103.5	50 - 150
27 EtFOSA			1000.00	1120.59	112.1	70 - 130
11 PFDoA			1000.00	950.57	95.1	70 - 130
D 38 13C2_PFDoA	722764	749370			103.7	50 - 150
4 10:2 FTS			964.00	616.29	63.9	70 - 130
34 PFDOS			968.00	863.59	89.2	70 - 130
24 PFTrDA			1000.00	992.17	99.2	70 - 130
23 PFTeDA			1000.00	912.33	91.2	70 - 130
D 42 13C2_PFTeDA	1022490	1112132			108.8	50 - 150
D 40 13C2_PFHxDA	983864	1021329			103.8	50 - 150
35 PFHxDA			1000.00	1055.17	105.5	70 - 130
36 PFODA			1000.00	999.10	99.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080421-DOD.b\080421068.d
Injection Date: 04-Aug-2021 23:28:01 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 60
Sample Info: ID CCV 1000C_SVLC-1573 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	627821	665290			106	50 - 150
8 PFBA			1000.00	956.43	95.6	70 - 130
D 50 13C5_PFPeA	594861	652695			109.7	50 - 150
21 PFPeA			1000.00	916.23	91.6	70 - 130
7 PFBS			884.00	796.90	90.1	70 - 130
D 44 13C3_PFBS	191316	211767			110.7	50 - 150
D 63 13C2_4:2 FTS_2	113853	114508			100.6	50 - 150
1 4:2 FTS			934.00	935.78	100.2	70 - 130
D 49 13C5_PFHxA	699983	765686			109.4	50 - 150
15 PFHxA			1000.00	846.37	84.6	70 - 130
22 PFPeS			938.00	859.87	91.7	70 - 130
28 GenX			2000.00	1899.72	95	70 - 130
D 66 13C3_GenX	1232176	1238957			100.6	50 - 150
D 47 13C4_PFHpA	563315	602293			106.9	50 - 150
13 PFHpA			1000.00	879.30	87.9	70 - 130
D 45 13C3_PFHxS	162707	180556			111	50 - 150
14 PFHxS			910.00	806.60	88.6	70 - 130
29 ADONA			942.00	805.12	85.5	70 - 130
D 64 13C2_6:2 FTS_2	94624	104842			110.8	50 - 150
2 6:2 FTS			948.00	1071.89	113.1	70 - 130
20 PFOA			1000.00	911.47	91.1	70 - 130
D 53 13C8_PFOA	520722	601698			115.6	50 - 150
12 PFHpS			952.00	821.82	86.3	70 - 130
18 PFOS			928.00	871.04	93.9	70 - 130
D 54 13C8_PFOS	155583	177353			114	50 - 150
17 PFNA			1000.00	886.75	88.7	70 - 130
D 56 13C9_PFNA	683223	760633			111.3	50 - 150
30 9Cl-PF3ONS			932.00	805.85	86.5	70 - 130
D 55 13C8_PFOSA	335834	314960			93.8	50 - 150
19 PFOSA			1000.00	959.73	96	70 - 130
16 PFNS			960.00	780.64	81.3	70 - 130
D 65 13C2_8:2 FTS_2	109751	109716			100	50 - 150
10 PFDA			1000.00	877.57	87.8	70 - 130
3 8:2 FTS			958.00	965.44	100.8	70 - 130
D 51 13C6_PFDA	632664	723352			114.3	50 - 150
D 58 d3-MeFOSAA	796771	833146			104.6	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	941.22	94.1	70 - 130
9 PFDS			964.00	854.93	88.7	70 - 130
D 52 13C7_PFUdA	654046	739956			113.1	50 - 150
25 PFUdA			1000.00	990.45	99	70 - 130
D 60 d5-EtFOSAA	676164	754231			111.5	50 - 150
5 N-EtFOSAA			1000.00	912.86	91.3	70 - 130
D 61 d7-MeFOSE	81562	96207			118	50 - 150
32 MeFOSE			1000.00	1001.71	100.2	70 - 130
D 57 d3-MeFOSA	50898	53267			104.7	50 - 150
26 MeFOSA			1000.00	1264.44	126.4	70 - 130
31 11Cl-PF3OUDS			942.00	802.24	85.2	70 - 130
D 62 d9-EtFOSE	105638	103304			97.8	50 - 150
33 EtFOSE			1000.00	986.21	98.6	70 - 130
D 59 d5-EtFOSA	45744	49849			109	50 - 150
27 EtFOSA			1000.00	1019.93	102	70 - 130
11 PFDoA			1000.00	892.33	89.2	70 - 130
D 38 13C2_PFDoA	722764	789098			109.2	50 - 150
4 10:2 FTS			964.00	697.02	72.3	70 - 130
34 PFDOS			968.00	874.93	90.4	70 - 130
24 PFTrDA			1000.00	992.39	99.2	70 - 130
23 PFTeDA			1000.00	904.05	90.4	70 - 130
D 42 13C2_PFTeDA	1022490	1157535			113.2	50 - 150
D 40 13C2_PFHxDA	983864	1062635			108	50 - 150
35 PFHxDA			1000.00	1035.70	103.6	70 - 130
36 PFODA			1000.00	970.52	97.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521033.d
Injection Date: 05-Aug-2021 17:50:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 28
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1053.58	105.4	70 - 130
D 46 13C4_PFBA	574801	520148			90.5	50 - 150
D 50 13C5_PFPeA	538043	498761			92.7	50 - 150
21 PFPeA			1000.00	995.22	99.5	70 - 130
7 PFBS			884.00	906.31	102.5	70 - 130
D 44 13C3_PFBS	187099	166758			89.1	50 - 150
1 4:2 FTS			934.00	886.15	94.9	70 - 130
D 63 13C2_4:2 FTS_2	103169	93332			90.5	50 - 150
D 49 13C5_PFHxA	593317	585380			98.7	50 - 150
15 PFHxA			1000.00	1002.28	100.2	70 - 130
22 PFPeS			938.00	962.27	102.6	70 - 130
28 GenX			2000.00	2049.56	102.5	70 - 130
D 66 13C3_GenX	1107213	973569			87.9	50 - 150
D 47 13C4_PFHpA	479053	458114			95.6	50 - 150
13 PFHpA			1000.00	1003.54	100.4	70 - 130
D 45 13C3_PFHxS	139557	133587			95.7	50 - 150
14 PFHxS			910.00	901.87	99.1	70 - 130
29 ADONA			942.00	885.11	94	70 - 130
D 64 13C2_6:2 FTS_2	86994	79162			91	50 - 150
2 6:2 FTS			948.00	922.13	97.3	70 - 130
D 53 13C8_PFOA	486725	445981			91.6	50 - 150
20 PFOA			1000.00	1004.88	100.5	70 - 130
12 PFHpS			952.00	945.59	99.3	70 - 130
18 PFOS			928.00	899.40	96.9	70 - 130
D 54 13C8_PFOS	130612	134016			102.6	50 - 150
17 PFNA			1000.00	933.72	93.4	70 - 130
D 56 13C9_PFNA	580651	598155			103	50 - 150
30 9Cl-PF3ONS			932.00	897.91	96.3	70 - 130
D 55 13C8_PFOSA	268160	280646			104.7	50 - 150
19 PFOSA			1000.00	953.80	95.4	70 - 130
16 PFNS			960.00	892.78	93	70 - 130
D 65 13C2_8:2 FTS_2	97398	96551			99.1	50 - 150
3 8:2 FTS			958.00	913.89	95.4	70 - 130
10 PFDA			1000.00	901.28	90.1	70 - 130
D 51 13C6_PFDA	542953	554664			102.2	50 - 150
6 N-MeFOSAA			1000.00	955.43	95.5	70 - 130

Report Date: 06-Aug-2021 18:04:27 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521033.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	643531			107.9	50 - 150
9 PFDS			964.00	966.44	100.3	70 - 130
D 60 d5-EtFOSAA	592804	567361			95.7	50 - 150
D 52 13C7_PFUdA	631526	590027			93.4	50 - 150
5 N-EtFOSAA			1000.00	952.76	95.3	70 - 130
25 PFUdA			1000.00	992.78	99.3	70 - 130
D 61 d7-MeFOSE	89085	81112			91.1	50 - 150
32 MeFOSE			1000.00	1046.94	104.7	70 - 130
D 57 d3-MeFOSA	50589	47602			94.1	50 - 150
26 MeFOSA			1000.00	1173.61	117.4	70 - 130
31 11Cl-PF3OUDS			942.00	916.03	97.2	70 - 130
D 62 d9-EtFOSE	90529	94382			104.3	50 - 150
33 EtFOSE			1000.00	1065.48	106.5	70 - 130
D 59 d5-EtFOSA	43442	46837			107.8	50 - 150
27 EtFOSA			1000.00	878.51	87.9	70 - 130
11 PFDoA			1000.00	995.02	99.5	70 - 130
D 38 13C2_PFDoA	595792	564744			94.8	50 - 150
4 10:2 FTS			964.00	991.50	102.9	70 - 130
34 PFDOS			968.00	938.34	96.9	70 - 130
24 PFTrDA			1000.00	1024.92	102.5	70 - 130
23 PFTeDA			1000.00	1060.20	106	70 - 130
D 42 13C2_PFTeDA	902749	841479			93.2	50 - 150
35 PFHxDA			1000.00	979.19	97.9	70 - 130
D 40 13C2_PFHxDA	845704	825331			97.6	50 - 150
36 PFODA			1000.00	997.20	99.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521046.d
Injection Date: 05-Aug-2021 20:09:03 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 41
Sample Info: ID CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	994.13	99.4	70 - 130
D 46 13C4_PFBA	574801	559210			97.3	50 - 150
D 50 13C5_PFPeA	538043	518239			96.3	50 - 150
21 PFPeA			1000.00	998.95	99.9	70 - 130
7 PFBS			884.00	878.04	99.3	70 - 130
D 44 13C3_PFBS	187099	184758			98.7	50 - 150
1 4:2 FTS			934.00	890.56	95.3	70 - 130
D 63 13C2_4:2 FTS_2	103169	104687			101.5	50 - 150
D 49 13C5_PFHxA	593317	588586			99.2	50 - 150
15 PFHxA			1000.00	983.59	98.4	70 - 130
22 PFPeS			938.00	855.47	91.2	70 - 130
28 GenX			2000.00	1938.14	96.9	70 - 130
D 66 13C3_GenX	1107213	1097664			99.1	50 - 150
D 47 13C4_PFHpA	479053	480426			100.3	50 - 150
13 PFHpA			1000.00	1009.55	101	70 - 130
D 45 13C3_PFHxS	139557	132154			94.7	50 - 150
14 PFHxS			910.00	895.55	98.4	70 - 130
29 ADONA			942.00	952.99	101.2	70 - 130
D 64 13C2_6:2 FTS_2	86994	80335			92.3	50 - 150
2 6:2 FTS			948.00	906.49	95.6	70 - 130
D 53 13C8_PFOA	486725	472810			97.1	50 - 150
20 PFOA			1000.00	1008.79	100.9	70 - 130
12 PFHpS			952.00	1033.50	108.6	70 - 130
18 PFOS			928.00	910.82	98.1	70 - 130
D 54 13C8_PFOS	130612	130971			100.3	50 - 150
17 PFNA			1000.00	971.52	97.2	70 - 130
D 56 13C9_PFNA	580651	594899			102.5	50 - 150
30 9Cl-PF3ONS			932.00	894.15	95.9	70 - 130
D 55 13C8_PFOSA	268160	284434			106.1	50 - 150
19 PFOSA			1000.00	956.36	95.6	70 - 130
16 PFNS			960.00	966.53	100.7	70 - 130
D 65 13C2_8:2 FTS_2	97398	99614			102.3	50 - 150
3 8:2 FTS			958.00	925.77	96.6	70 - 130
10 PFDA			1000.00	991.82	99.2	70 - 130
D 51 13C6_PFDA	542953	553083			101.9	50 - 150
6 N-MeFOSAA			1000.00	987.28	98.7	70 - 130

Report Date: 06-Aug-2021 18:04:36 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521046.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	646576			108.4	50 - 150
9 PFDS			964.00	943.13	97.8	70 - 130
D 60 d5-EtFOSAA	592804	569512			96.1	50 - 150
D 52 13C7_PFUdA	631526	598172			94.7	50 - 150
5 N-EtFOSAA			1000.00	992.20	99.2	70 - 130
25 PFUdA			1000.00	997.85	99.8	70 - 130
D 61 d7-MeFOSE	89085	79332			89.1	50 - 150
32 MeFOSE			1000.00	986.63	98.7	70 - 130
D 57 d3-MeFOSA	50589	53587			105.9	50 - 150
26 MeFOSA			1000.00	943.06	94.3	70 - 130
31 11Cl-PF3OUDS			942.00	933.57	99.1	70 - 130
D 62 d9-EtFOSE	90529	102802			113.6	50 - 150
33 EtFOSE			1000.00	1005.30	100.5	70 - 130
D 59 d5-EtFOSA	43442	47297			108.9	50 - 150
27 EtFOSA			1000.00	982.12	98.2	70 - 130
11 PFDoA			1000.00	1052.18	105.2	70 - 130
D 38 13C2_PFDoA	595792	585725			98.3	50 - 150
4 10:2 FTS			964.00	812.10	84.2	70 - 130
34 PFDOS			968.00	1001.15	103.4	70 - 130
24 PFTrDA			1000.00	1012.31	101.2	70 - 130
23 PFTeDA			1000.00	1010.37	101	70 - 130
D 42 13C2_PFTeDA	902749	856905			94.9	50 - 150
35 PFHxDA			1000.00	1004.13	100.4	70 - 130
D 40 13C2_PFHxDA	845704	833630			98.6	50 - 150
36 PFODA			1000.00	1015.55	101.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521063.d
Injection Date: 05-Aug-2021 23:10:09 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 58
Sample Info: ID CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1008.80	100.9	70 - 130
D 46 13C4_PFBA	574801	541416			94.2	50 - 150
D 50 13C5_PFPeA	538043	521356			96.9	50 - 150
21 PFPeA			1000.00	1000.12	100	70 - 130
7 PFBS			884.00	925.46	104.7	70 - 130
D 44 13C3_PFBS	187099	179951			96.2	50 - 150
1 4:2 FTS			934.00	998.36	106.9	70 - 130
D 63 13C2_4:2 FTS_2	103169	97774			94.8	50 - 150
D 49 13C5_PFHxA	593317	621047			104.7	50 - 150
15 PFHxA			1000.00	892.01	89.2	70 - 130
22 PFPeS			938.00	924.19	98.5	70 - 130
28 GenX			2000.00	1947.00	97.4	70 - 130
D 66 13C3_GenX	1107213	1096856			99.1	50 - 150
D 47 13C4_PFHpA	479053	538047			112.3	50 - 150
13 PFHpA			1000.00	898.11	89.8	70 - 130
D 45 13C3_PFHxS	139557	138199			99	50 - 150
14 PFHxS			910.00	939.71	103.3	70 - 130
29 ADONA			942.00	916.90	97.3	70 - 130
D 64 13C2_6:2 FTS_2	86994	83386			95.9	50 - 150
2 6:2 FTS			948.00	916.69	96.7	70 - 130
D 53 13C8_PFOA	486725	485936			99.8	50 - 150
20 PFOA			1000.00	964.23	96.4	70 - 130
12 PFHpS			952.00	1041.82	109.4	70 - 130
18 PFOS			928.00	865.48	93.3	70 - 130
D 54 13C8_PFOS	130612	137716			105.4	50 - 150
17 PFNA			1000.00	998.32	99.8	70 - 130
D 56 13C9_PFNA	580651	586407			101	50 - 150
30 9Cl-PF3ONS			932.00	890.08	95.5	70 - 130
D 55 13C8_PFOSA	268160	275293			102.7	50 - 150
19 PFOSA			1000.00	956.68	95.7	70 - 130
16 PFNS			960.00	858.09	89.4	70 - 130
D 65 13C2_8:2 FTS_2	97398	87225			89.6	50 - 150
3 8:2 FTS			958.00	1190.72	124.3	70 - 130
10 PFDA			1000.00	993.23	99.3	70 - 130
D 51 13C6_PFDA	542953	529232			97.5	50 - 150
6 N-MeFOSAA			1000.00	909.30	90.9	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	694288			116.4	50 - 150
9 PFDS			964.00	1000.68	103.8	70 - 130
D 60 d5-EtFOSAA	592804	633679			106.9	50 - 150
D 52 13C7_PFUdA	631526	589964			93.4	50 - 150
5 N-EtFOSAA			1000.00	953.32	95.3	70 - 130
25 PFUdA			1000.00	977.75	97.8	70 - 130
D 61 d7-MeFOSE	89085	85227			95.7	50 - 150
32 MeFOSE			1000.00	1072.29	107.2	70 - 130
D 57 d3-MeFOSA	50589	51531			101.9	50 - 150
26 MeFOSA			1000.00	1009.02	100.9	70 - 130
31 11Cl-PF3OUDS			942.00	908.04	96.4	70 - 130
D 62 d9-EtFOSE	90529	98049			108.3	50 - 150
33 EtFOSE			1000.00	1069.04	106.9	70 - 130
D 59 d5-EtFOSA	43442	47639			109.7	50 - 150
27 EtFOSA			1000.00	879.26	87.9	70 - 130
11 PFDoA			1000.00	1063.52	106.4	70 - 130
D 38 13C2_PFDoA	595792	554333			93	50 - 150
4 10:2 FTS			964.00	990.78	102.8	70 - 130
34 PFDOS			968.00	924.13	95.5	70 - 130
24 PFTrDA			1000.00	1007.21	100.7	70 - 130
23 PFTeDA			1000.00	1085.34	108.5	70 - 130
D 42 13C2_PFTeDA	902749	847321			93.9	50 - 150
35 PFHxDA			1000.00	1018.30	101.8	70 - 130
D 40 13C2_PFHxDA	845704	828962			98	50 - 150
36 PFODA			1000.00	988.29	98.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521079.d
Injection Date: 06-Aug-2021 02:00:13 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 74
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	980.66	98.1	70 - 130
D 46 13C4_PFBA	574801	545821			95	50 - 150
D 50 13C5_PFPeA	538043	500058			92.9	50 - 150
21 PFPeA			1000.00	968.68	96.9	70 - 130
7 PFBS			884.00	845.52	95.6	70 - 130
D 44 13C3_PFBS	187099	181337			96.9	50 - 150
1 4:2 FTS			934.00	1038.02	111.1	70 - 130
D 63 13C2_4:2 FTS_2	103169	89274			86.5	50 - 150
D 49 13C5_PFHxA	593317	565698			95.3	50 - 150
15 PFHxA			1000.00	976.98	97.7	70 - 130
22 PFPeS			938.00	858.08	91.5	70 - 130
28 GenX			2000.00	1895.16	94.8	70 - 130
D 66 13C3_GenX	1107213	1039356			93.9	50 - 150
D 47 13C4_PFHpA	479053	476498			99.5	50 - 150
13 PFHpA			1000.00	961.09	96.1	70 - 130
D 45 13C3_PFHxS	139557	134177			96.1	50 - 150
14 PFHxS			910.00	923.20	101.5	70 - 130
29 ADONA			942.00	913.88	97	70 - 130
D 64 13C2_6:2 FTS_2	86994	85196			97.9	50 - 150
2 6:2 FTS			948.00	883.71	93.2	70 - 130
D 53 13C8_PFOA	486725	460739			94.7	50 - 150
20 PFOA			1000.00	1006.56	100.7	70 - 130
12 PFHpS			952.00	932.98	98	70 - 130
18 PFOS			928.00	908.35	97.9	70 - 130
D 54 13C8_PFOS	130612	132850			101.7	50 - 150
17 PFNA			1000.00	967.02	96.7	70 - 130
D 56 13C9_PFNA	580651	575132			99	50 - 150
30 9Cl-PF3ONS			932.00	895.24	96.1	70 - 130
D 55 13C8_PFOSA	268160	269674			100.6	50 - 150
19 PFOSA			1000.00	943.30	94.3	70 - 130
16 PFNS			960.00	970.28	101.1	70 - 130
D 65 13C2_8:2 FTS_2	97398	94325			96.8	50 - 150
3 8:2 FTS			958.00	943.77	98.5	70 - 130
10 PFDA			1000.00	934.19	93.4	70 - 130
D 51 13C6_PFDA	542953	522815			96.3	50 - 150
6 N-MeFOSAA			1000.00	1050.09	105	70 - 130

Report Date: 06-Aug-2021 18:04:06 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521079.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	652404			109.4	50 - 150
9 PFDS			964.00	930.36	96.5	70 - 130
D 60 d5-EtFOSAA	592804	601048			101.4	50 - 150
D 52 13C7_PFUdA	631526	574892			91	50 - 150
5 N-EtFOSAA			1000.00	951.09	95.1	70 - 130
25 PFUdA			1000.00	1016.48	101.6	70 - 130
D 61 d7-MeFOSE	89085	75784			85.1	50 - 150
32 MeFOSE			1000.00	1018.93	101.9	70 - 130
D 57 d3-MeFOSA	50589	48239			95.4	50 - 150
26 MeFOSA			1000.00	980.85	98.1	70 - 130
31 11Cl-PF3OUDS			942.00	884.58	93.9	70 - 130
D 62 d9-EtFOSE	90529	86411			95.5	50 - 150
33 EtFOSE			1000.00	1220.99	122.1	70 - 130
D 59 d5-EtFOSA	43442	47186			108.6	50 - 150
27 EtFOSA			1000.00	886.75	88.7	70 - 130
11 PFDoA			1000.00	1031.21	103.1	70 - 130
D 38 13C2_PFDoA	595792	564359			94.7	50 - 150
4 10:2 FTS			964.00	845.31	87.7	70 - 130
34 PFDOS			968.00	983.01	101.6	70 - 130
24 PFTrDA			1000.00	1041.09	104.1	70 - 130
23 PFTeDA			1000.00	988.45	98.8	70 - 130
D 42 13C2_PFTeDA	902749	871737			96.6	50 - 150
35 PFHxDA			1000.00	1002.45	100.2	70 - 130
D 40 13C2_PFHxDA	845704	819055			96.8	50 - 150
36 PFODA			1000.00	978.65	97.9	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\073121-DOD.b\073121007.d		
Injection Date:	31-Jul-2021 13:04:55	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.699	1	609606	21	>100:1			1001.00	1105.57	96.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.705		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.067	1	568132	16	>100:1			1001.00	1100.31	97.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.067		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	1	171331	15	>100:1			1001.00	987.12	94.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.120		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.451		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.389	2.380	1	107904	18	>100:1			5005.00	5412.56	98.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.380		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.425	2.425	1	627508	17	>100:1			1001.00	1040.53	93.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.425		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.541	2.541	1	1220739	17	>100:1			5005.00	5731.95	96.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.541		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.791	2.791	1	535330	18	>100:1			1001.00	1103.81	98.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.800		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.809	2.809	1	152660	17	>100:1			1001.00	1099.21	103.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.800		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.827		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.174		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.140	3.148	0	96584	20	>100:1			5005.00	6158.61	103.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.141		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.167	3.168	0	527786	21	>100:1			1001.00	1066.75	103.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.168		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.536	3.545	0	139733	19	>100:1			1001.00	1003.29	94.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.545		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.754		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.880		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.197		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.357		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.701		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.544	3.553	0	649103	19	>100:1			1001.00	1065.51	102.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.553		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.836	3.839	0	284462	17	>100:1			1001.00	1065.48	99.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.839		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.893	3.888	1	111770	17				5005.00	6603.41	103	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.896		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.500		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.893	3.896	0	588720	17	>100:1			1001.00	998.07	95.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.896		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.050	4.054	0	679044	18	>100:1			5005.00	5087.06	106.3	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.063		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.213	4.217	0	614742	16	>100:1			1001.00	935.86	91.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.206		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.213	4.217	0	603087	16	>100:1			5005.00	5247.42	101.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.217		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.274	4.278	0	87606	16	>100:1			1001.00	1166.25	96.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.288		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.294	4.288	1	50301	11	>100:1			1001.00	1022.43	92.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.298		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.437	1	90927	15	>100:1			1001.00	1161.57	95.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.446		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.461	4.464	0	49036	16	>100:1			1001.00	1180.28	94.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.473		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.487	4.491	0	614476	15	>100:1			1001.00	827.66	94.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.482		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.728		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.949	4.951	0	914972	18	>100:1			1001.00	1045.65	96	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.951		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.335	5.339	0	933402	18	>100:1			1001.00	1115.07	103.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.343	5.339	1/1	5340	16	26:1	Target = 10.45		9.5839	9.5839		
813 > 269	40	5.343	5.339		633	17	29:1	8.43 (5.22-15.68)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.712		ND								
*** 37 13C2_PFDA**													
515 > 470		3.893	3.896	0	618812	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.425	2.425	1	578002	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.167	3.168	0	519387	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.699	1.699	1	527602	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.544	3.545	0	135742	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\080421-DOD.b\080421008.d		
Injection Date:	04-Aug-2021 12:49:43	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	98
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.699	1	639493	20	>100:1			1001.00	1159.77	101.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.699		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.067	0	627844	16	>100:1			1001.00	1215.96	105.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.067		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.119	2.120	0	184066	15	>100:1			1001.00	1060.49	96.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.120		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.451		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.380	1	125438	17	>100:1			5005.00	6292.08	110.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.380		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.424	2.424	0	742236	17	>100:1			1001.00	1230.77	106	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.424		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.540	2.531	1	1322093	18	>100:1			5005.00	6207.86	107.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.540		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.790	2.791	0	571229	16	>100:1			1001.00	1177.83	101.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.791		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.808	2.809	0	155142	18	>100:1			1001.00	1117.08	95.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.809		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.836		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.174		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.152	3.141	1	94946	21	>100:1			5005.00	6054.16	100.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.154		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.172	3.168	1	540327	19	>100:1			1001.00	1092.09	103.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.168		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.543	3.537	1	145214	17	>100:1			1001.00	1042.64	93.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.545		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.747		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.888		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.187		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.357		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.701		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.551	3.545	1	703671	19	>100:1			1001.00	1155.09	103	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.545		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.835	3.831	1	320765	17	>100:1			1001.00	1201.46	95.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.831		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.893	3.888	1	109620	17				5005.00	6476.39	99.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.896		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.500		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.893	3.896	0	620789	18	>100:1			1001.00	1052.44	98.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.896		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.058	4.054	1	836711	17	>100:1			5005.00	6268.23	105	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.063		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.211	4.206	1	672347	15	>100:1			1001.00	1023.55	102.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.206		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.211	4.206	1	729628	16	>100:1			5005.00	6348.44	107.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.227		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.262	4.268	0	91480	15	>100:1			1001.00	1217.82	112.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.278		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.282	4.278	1	54028	13	>100:1			1001.00	1098.18	106.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.288		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.432	4.428	1	113633	16	>100:1			1001.00	1451.64	107.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.446		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.450	4.455	0	48456	15	>100:1			1001.00	1166.32	105.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.464		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.495	4.482	1	626277	16	>100:1			1001.00	843.56	86.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.491		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.728		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.956	4.951	1	1017728	17	>100:1			1001.00	1163.09	99.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.951		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.343	5.347	0	1050225	18	>100:1			1001.00	1254.63	106.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													U
813 > 769	40		5.347		ND								
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.726		ND								
*** 37 13C2_PFDA**													
515 > 470		3.901	3.896	1	646233	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.424	2.424	0	649803	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.172	3.168	1	561876	19	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.704	1.699	1	553737	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.543	3.537	1	146729	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Extract Dilution Preparations

537	**1X**	**5X**	**10X**	**20X**	**50X**	**100X**	**200X**	**500X**	**1000X**	**2000X**
EXTRACT (uL)	950	200	100	50	20	10	20	8	4	2
IS (uL)	50	40	45	47.5	49	49.5	199	199.6	199.8	199.9
96% MeOH (uL)	-	760	855	902.5	931	940.5	3781	3792.4	3796.2	3798.1
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/Vol	1/(Vol*0.2)	1/(Vol*0.1)	1/(Vol*0.05)	1/(Vol*0.02)	1/(Vol*0.01)	1/(Vol*0.005)	1/(Vol*0.002)	1/(Vol*0.001)	1/(Vol*0.0005)
ID Aq	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	(1/0.91)* (FV/V_o)	5* (FV/V_o)	10* (FV/V_o)	20* (FV/V_o)	50* (FV/V_o)	100* (FV/V_o)	200* (FV/V_o)	500* (FV/V_o)	1000* (FV/V_o)	2000* (FV/V_o)
DAI	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
SAMPLE (uL)	700	140	70	35	14	7	14	5.6	2.8	1.4
SUR (uL)	25	25	25	25	25	25	100	100	100	100
MeOH (uL)	275	275	275	275	275	275	1100	1100	1100	1100
Water (uL)	0	560	630	665	686	693	2786	2794.4	2797.2	2798.6
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/.7	1/.14	1/.07	1/.035	1/.014	1/.007	4/.014	4/.0056	4/.0028	4/.0014
ID Solid	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	((V_E/(M*S))/ 0.91)/1000	((V_E/(M*S))/ 0.2)/1000	((V_E/(M*S))/ 0.1)/1000	((V_E/(M*S))/ 0.05)/1000	((V_E/(M*S))/ 0.02)/1000	((V_E/(M*S))/ 0.01)/1000	((V_E/(M*S))/ 0.005)/1000	((V_E/ (M*S))/ 0.002)/1000	((V_E/ (M*S))/ 0.001)/1000	((V_E/ (M*S))/ 0.0005)/1000

NOTE: Dilutions of 100x or below will be prepped in 1-mL FV; dilutions higher than 100x and will be prepped in 4-mL FV.

Report Date: 23-Jul-2021 08:47:38 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\072221b-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L ICAL 50_SVLC-1545A	22-Jul-2021 23:17:47	072221B017.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1546	22-Jul-2021 23:28:24	072221B018.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1547	22-Jul-2021 23:38:59	072221B019.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1548	22-Jul-2021 23:49:35	072221B020.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1573	23-Jul-2021 00:00:15	072221B021.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1550	23-Jul-2021 00:10:49	072221B022.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1551	23-Jul-2021 00:21:27	072221B023.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1552	23-Jul-2021 00:32:08	072221B024.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1553	23-Jul-2021 00:42:44	072221B025.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1554	23-Jul-2021 00:53:22	072221B026.d	ICal					Analytes	L-10	1.00		
11	ID IBLK A	23-Jul-2021 01:04:03	072221B027.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1577	23-Jul-2021 01:14:35	072221B028.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK STD_SVLC-1562	23-Jul-2021 01:25:08	072221B029.d	CheckStd					IsomerCheck	Smp	1.00		

Report Date: 03-Aug-2021 19:54:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\073121-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	31-Jul-2021 12:43:44	073121005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	31-Jul-2021 12:54:21	073121006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	31-Jul-2021 13:04:55	073121007.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ10645-001	31-Jul-2021 13:15:31	073121008.d	MBlk		Soil	1	10645	Surrogates	Smp	0.1100		
2	WQ10645-002	31-Jul-2021 13:26:10	073121009.d	LCS		Soil	1	10645	Analytes	100x PDS	0.1000		
3	WQ10559-001	31-Jul-2021 13:36:46	073121010.d	MBlk		Aqueous	1	10559	Surrogates	Smp	0.1100		MB contaminated with 6:2-FTS
4	WQ10559-002	31-Jul-2021 13:47:25	073121011.d	LCS		Aqueous	1	10559	Analytes	100x PDS	0.2000		6:2(567.9%),rx/ncm affected samples
5	WG30006-001	31-Jul-2021 13:58:05	073121012.d	Client	AFFF21-SB03-00-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
6	WG30006-002	31-Jul-2021 14:08:44	073121013.d	Client	AFFF21-SB03-06-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
7	WG30006-003	31-Jul-2021 14:19:22	073121014.d	Client	AFFF21-SB03-06-072921-01	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
8	WG30006-004	31-Jul-2021 14:30:04	073121015.d	Client	AFFF21-SB03-12-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
9	WG30006-005	31-Jul-2021 14:40:42	073121016.d	Client	AFFF21-SB03-18-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
10	WG30006-006	31-Jul-2021 14:51:21	073121017.d	Client	AFFF21-SB03-24-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
11	WG30006-007	31-Jul-2021 15:02:02	073121018.d	Client	AFFF21-SB03-28-072921-00	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
12	WG30006-008	31-Jul-2021 15:12:35	073121019.d	Client	AFFF21-GW03-23-072921-00	Aqueous	50	10648	Surrogates	Smp	0.1100		RR-1X
13	WG30006-009	31-Jul-2021 15:23:09	073121020.d	Client	AFFF21-GW03-15-072921-00	Aqueous	50	10648	Surrogates	Smp	0.1100		RR-10X
14	WG29007-003	31-Jul-2021 15:33:43	073121021.d	Client	AFFF21-SB13-12-0728210-0	Soil	50	10645	Surrogates	Smp	0.1100		RR-1X
15	ID CCV 1000_SVLC-1573	31-Jul-2021 15:44:21	073121022.d	CCV					Analytes	L-5	1.00		
16	CCB 1	31-Jul-2021 15:55:04	073121023.d	InstBlk					Surrogates	Smp	0.1100		
17	WQ10561-001	31-Jul-2021 16:05:40	073121024.d	MBlk		Soil	1	10561	Surrogates	Smp	0.1100		
18	WQ10561-002	31-Jul-2021 16:16:20	073121025.d	LCS		Soil	1	10561	Analytes	100x PDS	0.1000		
19	WQ10648-001	31-Jul-2021 16:26:57	073121026.d	MBlk		Aqueous	1	10648	Surrogates	Smp	0.1100		6:2-FTS (119.39ng/L), NCM/RX affected samples
20	WQ10648-002	31-Jul-2021 16:37:38	073121027.d	LCS		Aqueous	1	10648	Analytes	100x PDS	0.2000		6:2(148.5%),RX/NCM affected samples
21	WG29007-001	31-Jul-2021 16:48:21	073121028.d	Client	AFFF21-SB13-00-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
22	WG29007-002	31-Jul-2021 16:58:59	073121029.d	Client	AFFF21-SB13-06-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
23	WG29007-004	31-Jul-2021 17:09:34	073121030.d	Client	AFFF21-SB13-18-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
24	WG29007-005	31-Jul-2021 17:20:14	073121031.d	Client	AFFF21-SB13-30-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
25	WG29007-007	31-Jul-2021 17:30:51	073121032.d	Client	AFFF21-SB15-06-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
26	WG29007-009	31-Jul-2021 17:41:26	073121033.d	Client	AFFF21-SB15-30-0728210-0	Soil	1	10498	Surrogates	Smp	0.1100		
27	WG29007-011	31-Jul-2021 17:52:04	073121034.d	Client	AFFF21-SB01-00-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		RX, SUR: MeFOSAA(LOW),EtFOSAA(LOW)
28	WG29007-012	31-Jul-2021 18:02:47	073121035.d	Client	AFFF21-SB01-09-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		
29	WG29007-013	31-Jul-2021 18:13:24	073121036.d	Client	AFFF21-SB01-09-072821-01	Soil	1	10498	Surrogates	Smp	0.1100		
30	WG22019-003	31-Jul-2021 18:24:03	073121037.d	Client	RRAD-FFTA-02-SE-072021	Soil	10	10065	Surrogates	Smp	0.1100		
31	ID CCV 1000A_SVLC-1573	31-Jul-2021 18:34:45	073121038.d	CCV					Analytes	L-5	1.00		
32	CCB 2	31-Jul-2021 18:45:20	073121039.d	InstBlk					Surrogates	Smp	0.1100		
33	WQ10417-001	31-Jul-2021 18:55:55	073121040.d	MBlk		Aqueous	1	10417	Surrogates	Smp	0.1100		
34	WQ10417-002	31-Jul-2021 19:06:31	073121041.d	LCS		Aqueous	1	10417	Analytes	100x PDS	0.2000		
35	WG22086-005	31-Jul-2021 19:17:10	073121042.d	Client	DPG-PF-01-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
36	WG22086-014	31-Jul-2021 19:27:49	073121043.d	Client	DPG-FD-04-SO-072021	Soil	1	10344	Surrogates	Smp	0.1100		
37	WG29007-006	31-Jul-2021 19:38:25	073121044.d	Client	AFFF21-SB15-00-0728210-0	Soil	5	10498	Surrogates	Smp	0.1100		
38	WG29007-008	31-Jul-2021 19:49:05	073121045.d	Client	AFFF21-SB15-12-0728210-0	Soil	5	10498	Surrogates	Smp	0.1100		
39	WG24009-001	31-Jul-2021 19:59:43	073121046.d	Client	AOPC22-10J02A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		
40	WG24009-002	31-Jul-2021 20:10:23	073121047.d	Client	AOPC22-10J02A-072221-FD	Aqueous	1	10417	Surrogates	Smp	0.1100		
41	WG24009-003	31-Jul-2021 20:21:03	073121048.d	Client	AOPC5-14D28A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-20X

Report Date: 03-Aug-2021 19:54:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\073121-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
42	WG24009-004	31-Jul-2021 20:31:40	073121049.d	Client	AOPC5-14D36A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-100X, SUR: PFOS(low),PFNA(low)
43	WG24009-005	31-Jul-2021 20:42:20	073121050.d	Client	AOPC22-10J01A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X
44	WG24009-006	31-Jul-2021 20:53:01	073121051.d	Client	AOPC6-14D02A-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-100X
45	ID CCV 1000B_SVLC-1573	31-Jul-2021 21:03:38	073121052.d	CCV					Analytes	L-5	1.00		
46	CCB 3	31-Jul-2021 21:14:16	073121053.d	InstBlk					Surrogates	Smp	0.1100		
47	WG30006-001	31-Jul-2021 21:24:57	073121054.d	Client	AFFF21-SB03-00-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
48	WG30006-002	31-Jul-2021 21:35:37	073121055.d	Client	AFFF21-SB03-06-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
49	WG30006-003	31-Jul-2021 21:46:15	073121056.d	Client	AFFF21-SB03-06-072921-01	Soil	1	10645	Surrogates	Smp	0.1100		
50	WG30006-004	31-Jul-2021 21:56:55	073121057.d	Client	AFFF21-SB03-12-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
51	WG30006-005	31-Jul-2021 22:07:35	073121058.d	Client	AFFF21-SB03-18-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
52	WG30006-006	31-Jul-2021 22:18:09	073121059.d	Client	AFFF21-SB03-24-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
53	WG30006-007	31-Jul-2021 22:28:44	073121060.d	Client	AFFF21-SB03-28-072921-00	Soil	1	10645	Surrogates	Smp	0.1100		
54	WG30006-008	31-Jul-2021 22:39:20	073121061.d	Client	AFFF21-GW03-23-072921-00	Aqueous	1	10648	Surrogates	Smp	0.1100		SUR: MFOSA(low),TeDA(low),CENTRIFUGED,NCM
55	WG30006-009	31-Jul-2021 22:49:59	073121062.d	Client	AFFF21-GW03-15-072921-00	Aqueous	1	10648	Surrogates	Smp	0.1100		mis-prep, rr-10X
56	WG29007-003	31-Jul-2021 23:00:44	073121063.d	Client	AFFF21-SB13-12-0728210-0	Soil	1	10645	Surrogates	Smp	0.1100		reanalyzed with MS/MSD, not reported
57	ID CCV 1000C_SVLC-1573	31-Jul-2021 23:11:23	073121064.d	CCV					Analytes	L-5	1.00		
58	CCB 4	31-Jul-2021 23:22:02	073121065.d	InstBlk					Surrogates	Smp	0.1100		
59	WG29009-004	31-Jul-2021 23:32:42	073121066.d	Client	AFFF01-FRB-072821-01-T2	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS contamination, rx
60	WG29009-008	31-Jul-2021 23:43:21	073121067.d	Client	AFFF01-FRB-072821-01-T1	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
61	WG29009-009	31-Jul-2021 23:54:01	073121068.d	Client	AFFF01-RB-072821-01-T1	Aqueous	1	10648	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
62	WG29007-010	01-Aug-2021 00:04:43	073121069.d	Client	AFFF21-FRB-01-072821-03-	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
63	WG29007-018	01-Aug-2021 00:15:21	073121070.d	Client	AFFF21-FRB-02-072821-T4	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
64	WG29007-019	01-Aug-2021 00:26:04	073121071.d	Client	AFFF21-RB-01-072821-T4	Aqueous	1	10559	Surrogates	Smp	0.1100		6:2-FTS CONTAMINATION, RX
65	ID CCV 1000D_SVLC-1573	01-Aug-2021 00:36:49	073121072.d	CCV					Analytes	L-5	1.00		

Report Date: 09-Aug-2021 19:40:13 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\organics\LL\LCMSMS02.i\080421-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 22-Jul-2021 23:17:47 Cal End Date: 23-Jul-2021 00:53:22

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1546	04-Aug-2021 12:17:56	080421005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1547	04-Aug-2021 12:28:33	080421006.d	CCV					Analytes	L-3	1.00		
98	ID IBLK A	04-Aug-2021 12:49:43	080421008.d	InstBlk					Surrogates	Smp	0.1100		
2	WQ10851-002	04-Aug-2021 13:11:01	080421010.d	LCS		Aqueous	1		Analytes	100x PDS	0.2000		
3	WQ10972-001	04-Aug-2021 13:21:34	080421011.d	MBlk		Aqueous	1	10972	Surrogates	Smp	0.1100		ADONA @ 1.79; 6:2 @ 3.95ng/L
4	WQ10972-002	04-Aug-2021 13:32:15	080421012.d	LCS		Aqueous	1	10972	Analytes	100x PDS	0.2000		ADONA/6:2 HIGH - MANIFOLD CONT?
5	WQ10799-001	04-Aug-2021 13:42:50	080421013.d	MBlk		Aqueous	1	10799	Surrogates	Smp	0.1100		
6	WQ10799-004	04-Aug-2021 13:53:25	080421014.d	MBlk		Aqueous	1	10799	Surrogates	Smp	0.1100		
7	WQ10799-002	04-Aug-2021 14:04:02	080421015.d	LCS		Aqueous	1	10799	Surrogates	Smp	0.1100		
8	WQ10799-003	04-Aug-2021 14:14:45	080421016.d	LCSD		Aqueous	1	10799	Surrogates	Smp	0.1100		
9	WQ10799-104	04-Aug-2021 14:25:23	080421017.d	LCS		Aqueous	1	10799	Analytes	100x PDS	0.2000		
10	WG20004-014	04-Aug-2021 14:36:01	080421018.d	Client	AOPC3-W7-9-071421	Aqueous	1	10799	Surrogates	Smp	0.1100		
11	WG31020-010	04-Aug-2021 14:46:43	080421019.d	Client	AFFF01-FRB-02-073021-T1	Aqueous	1	10799	Surrogates	Smp	0.1100		
12	WG31020-015	04-Aug-2021 14:57:18	080421020.d	Client	AFFF01-FRB-01-073021-T2	Aqueous	1	10799	Surrogates	Smp	0.1100		
13	WG28008-006	04-Aug-2021 15:07:52	080421021.d	Client	ASTC-DECON-(072721)	Aqueous	1	10799	Surrogates	Smp	0.1100		
14	WG29004-001	04-Aug-2021 15:18:25	080421022.d	Client	FTKX-FB-1-072721	Aqueous	1	10799	Surrogates	Smp	0.1100		
15	WG29004-002	04-Aug-2021 15:29:02	080421023.d	Client	FTKX-EB-1-072721	Aqueous	1	10799	Surrogates	Smp	0.1100		
16	WG29004-007	04-Aug-2021 15:39:41	080421024.d	Client	FTKX-FD-1-SW-072721	Aqueous	1	10799	Surrogates	Smp	0.1100		sur: TeDA(low), RX
17	ID CCV 1000_SVLC-1573	04-Aug-2021 15:50:19	080421025.d	CCV					Analytes	L-5	1.00		
18	CCB 1	04-Aug-2021 16:00:58	080421026.d	InstBlk					Surrogates	Smp	0.1100		
19	WG30020-003	04-Aug-2021 16:11:34	080421027.d	Client	AFFF01-SW04-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		RR-1X(6:2)
20	WG30020-004	04-Aug-2021 16:22:16	080421028.d	Client	AFFF01-SW05-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		6:2 ND, NCM
21	WG30020-004DU	04-Aug-2021 16:32:55	080421029.d	Client		Aqueous	1	10747	Surrogates	Smp	0.1100		6:2 ND, NCM
22	WG24008-001	04-Aug-2021 16:43:33	080421030.d	Client	AOPC20-SW01-EF-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
23	WG24008-003	04-Aug-2021 16:54:08	080421031.d	Client	AOPC13-SW01-EF-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
24	WG24008-004	04-Aug-2021 17:04:46	080421032.d	Client	AOPC13-SW01-EF-072221-FD	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
25	WG24008-005	04-Aug-2021 17:15:23	080421033.d	Client	AOPC15-SW01-EF-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
26	WG24008-005MS	04-Aug-2021 17:25:58	080421034.d	MS		Aqueous	1	10417	Analytes	100x PDS	0.2000		
27	WG24008-005MD	04-Aug-2021 17:36:37	080421035.d	MSD		Aqueous	1	10417	Analytes	100x PDS	0.2000		
28	WG24009-008	04-Aug-2021 17:47:17	080421036.d	Client	FB-12-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
29	WG24009-009	04-Aug-2021 17:57:55	080421037.d	Client	AOPC17,21-EXW-4-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
30	WG24009-010	04-Aug-2021 18:08:35	080421038.d	Client	AOPC18-A-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
31	ID CCV 1000A_SVLC-1573	04-Aug-2021 18:19:17	080421039.d	CCV					Analytes	L-5	1.00		6:2(130.9%), RR/NCM affected samples
32	CCB 2	04-Aug-2021 18:29:52	080421040.d	InstBlk					Surrogates	Smp	0.1100		
33	WG24008-006	04-Aug-2021 18:40:28	080421041.d	Client	AOPC15-SW01-IN-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		RR-1X(6:2)
34	WG24009-011	04-Aug-2021 18:51:03	080421042.d	Client	FB-13-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		6:2 ND, NCM
35	WG30020-002	04-Aug-2021 19:01:42	080421043.d	Client	AFFF01-SW03-072921-00-T2	Aqueous	5	10747	Surrogates	Smp	0.1100		RR-1X
36	WG30020-002MS	04-Aug-2021 19:12:20	080421044.d	MS		Aqueous	5	10747	Analytes	100x PDS	0.2000		
37	WG30020-011	04-Aug-2021 19:22:57	080421045.d	Client	AFFF01-SB13-01-072921-00	Soil	5	10645	Surrogates	Smp	0.1100		RR-5X(6:2)
38	WG24009-007	04-Aug-2021 19:33:40	080421046.d	Client	AOPC1,6,7-14C60A-072221	Aqueous	10	10417	Surrogates	Smp	0.1100		RR-5X(6:2)
39	WG24009-003	04-Aug-2021 19:44:18	080421047.d	Client	AOPC5-14D28A-072221	Aqueous	20	10417	Surrogates	Smp	0.1100		RR-20X(6:2)
40	WG24008-002	04-Aug-2021 19:54:57	080421048.d	Client	AOPC13-SW01-IN-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		RR-50x(6:2)
41	WG24009-004	04-Aug-2021 20:05:40	080421049.d	Client	AOPC5-14D36A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		RR-100X(6:2)
42	WG24009-006	04-Aug-2021 20:16:18	080421050.d	Client	AOPC6-14D02A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		RR-100X(6:2)

Report Date: 09-Aug-2021 19:40:13 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\organics\LL\LCMSMS02.i\080421-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
43	ID CCV 1000B_SVLC-1573	04-Aug-2021 20:26:55	080421051.d	CCV					Analytes	L-5	1.00		
44	CCB 3	04-Aug-2021 20:37:35	080421052.d	InstBlk					Surrogates	Smp	0.1100		
45	WQ11005-001	04-Aug-2021 20:48:12	080421053.d	MBlk		Aqueous	1	11005	Surrogates	Smp	0.1100		
46	WQ11005-002	04-Aug-2021 20:58:49	080421054.d	LCS		Aqueous	1	11005	Analytes	100x PDS	0.0200		
47	WQ11005-003	04-Aug-2021 21:09:32	080421055.d	LCSD		Aqueous	1	11005	Analytes	100x PDS	0.0200		
48	WQ11005-102	04-Aug-2021 21:20:15	080421056.d	LCS		Aqueous	1	11005	Analytes	10x PDS	0.0200		
49	WQ11005-103	04-Aug-2021 21:30:54	080421057.d	LCSD		Aqueous	1	11005	Analytes	10x PDS	0.0200		
50	WH03029-001	04-Aug-2021 21:41:33	080421058.d	Client	1-0-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		
51	WH03029-002	04-Aug-2021 21:52:14	080421059.d	Client	1-1-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		
52	WH03029-003	04-Aug-2021 22:02:49	080421060.d	Client	1-2-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		sur: BA(low),insufficient sample,NCM
53	WH03029-004	04-Aug-2021 22:13:26	080421061.d	Client	1-3-A-B-C	Aqueous	1	11005	Surrogates	Smp	0.1100		
54	WH03029-005	04-Aug-2021 22:24:01	080421062.d	Client	5-0-A	Aqueous	1	11005	Surrogates	Smp	0.1100		
55	WG29003-001	04-Aug-2021 22:34:45	080421063.d	Client	FTKX-FSDB-3-SO-0-2-07272	Soil	1	10498	Surrogates	Smp	0.1100		
56	WG29003-002	04-Aug-2021 22:45:24	080421064.d	Client	FTKX-FSDB-5-SO-2-3-07272	Soil	1	10498	Surrogates	Smp	0.1100		
57	WG29003-004	04-Aug-2021 22:56:04	080421065.d	Client	FTKX-SP-38-072721	Aqueous	1	10559	Surrogates	Smp	0.1100		sur: TeDA(LOW), CONFIRMED BY MS/MSD,NCM
58	WG29003-004MS	04-Aug-2021 23:06:43	080421066.d	MS		Aqueous	1	10559	Surrogates	Smp	0.1100		
59	WG29003-004MD	04-Aug-2021 23:17:22	080421067.d	MSD		Aqueous	1	10559	Surrogates	Smp	0.1100		
60	ID CCV 1000C_SVLC-1573	04-Aug-2021 23:28:01	080421068.d	CCV					Analytes	L-5	1.00		
61	WG24010-006	04-Aug-2021 23:38:41	080421069.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
62	WG24010-007	04-Aug-2021 23:49:21	080421070.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
63	WG24010-008	04-Aug-2021 23:59:59	080421071.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
64	WG24010-009	05-Aug-2021 00:10:40	080421072.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
65	WG24010-010	05-Aug-2021 00:21:18	080421073.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
66	WG23021-001	05-Aug-2021 00:31:56	080421074.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
67	WG23021-002	05-Aug-2021 00:42:35	080421075.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
68	WG23021-003	05-Aug-2021 00:53:15	080421076.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
69	WG23021-004	05-Aug-2021 01:03:55	080421077.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
70	WG23021-005	05-Aug-2021 01:14:37	080421078.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
71	WG23021-006	05-Aug-2021 01:25:19	080421079.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
72	WG23073-002	05-Aug-2021 01:35:49	080421080.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
73	WG23024-001	05-Aug-2021 01:46:19	080421081.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
74	WG24010-001	05-Aug-2021 01:56:50	080421082.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
75	WG24010-002	05-Aug-2021 02:07:33	080421083.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
76	WG22022-001	05-Aug-2021 02:18:15	080421084.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
77	WG27023-001	05-Aug-2021 02:28:56	080421085.d	Client		Aqueous	50		Surrogates	Smp	0.1100		RR-5X
78	WG24010-003	05-Aug-2021 02:39:38	080421086.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
79	WG24010-004	05-Aug-2021 02:50:17	080421087.d	Client		Aqueous	50		Surrogates	Smp	0.1100		
80	WG24010-005	05-Aug-2021 03:01:00	080421088.d	Client		Aqueous	50		Surrogates	Smp	0.1100		

Report Date: 06-Aug-2021 18:04:57 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58	080521006.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34	080521007.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09	080521008.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48	080521009.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22	080521010.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58	080521011.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33	080521012.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14	080521013.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51	080521014.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31	080521015.d	ICal					Analytes	L-10	1.00		
11	ID IBLK A	05-Aug-2021 14:50:11	080521016.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1590	05-Aug-2021 15:00:44	080521017.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK_SVLC-1562	05-Aug-2021 15:11:18	080521018.d	CheckStd					IsomerCheck	Smp	1.00		
14	ID IBLK B	05-Aug-2021 15:21:52	080521019.d	InstBlk					Surrogates	Smp	0.1100		
15	WQ10751-001	05-Aug-2021 15:32:30	080521020.d	Client		Soil	1	10751	Surrogates	Smp	0.1100		
16	WQ10751-002	05-Aug-2021 15:43:10	080521021.d	LCS		Soil	1	10751	Analytes	100x PDS	0.1000		
17	WQ10751-003	05-Aug-2021 15:53:47	080521022.d	LCSD		Soil	1	10751	Analytes	100x PDS	0.1000		
18	WG26022-001	05-Aug-2021 16:04:23	080521023.d	Client	OK-2	Soil	1	10751	Surrogates	Smp	0.1100		RR-100X
19	WG26022-002	05-Aug-2021 16:15:00	080521024.d	Client	OK-2A	Soil	1	10751	Surrogates	Smp	0.1100		
20	WG26022-003	05-Aug-2021 16:25:41	080521025.d	Client	OK-2B	Soil	1	10751	Surrogates	Smp	0.1100		
21	WG26022-004	05-Aug-2021 16:36:20	080521026.d	Client	OK-2C	Soil	1	10751	Surrogates	Smp	0.1100		
22	WG26023-001	05-Aug-2021 16:46:57	080521027.d	Client	OK-3	Soil	1	10751	Surrogates	Smp	0.1100		RR-100X
23	WG26023-002	05-Aug-2021 16:57:33	080521028.d	Client	OK-3A	Soil	1	10751	Surrogates	Smp	0.1100		
24	WG26023-003	05-Aug-2021 17:08:12	080521029.d	Client	OK-3B	Soil	1	10751	Surrogates	Smp	0.1100		
25	WG26023-004	05-Aug-2021 17:18:48	080521030.d	Client	OK-3C	Soil	1	10751	Surrogates	Smp	0.1100		
26	WG27006-001	05-Aug-2021 17:29:25	080521031.d	Client	FP-16	Soil	1	10751	Surrogates	Smp	0.1100		RR-10X, all sur fail
27	WG27006-002	05-Aug-2021 17:40:02	080521032.d	Client	FP-16A	Soil	1	10751	Surrogates	Smp	0.1100		
28	ID CCV 1000_SVLC-1600	05-Aug-2021 17:50:44	080521033.d	CCV					Analytes	L-5	1.00		
29	CCB 1	05-Aug-2021 18:01:26	080521034.d	InstBlk					Surrogates	Smp	0.1100		
30	WG27006-003	05-Aug-2021 18:12:05	080521035.d	Client	FP-16C	Soil	1	10751	Surrogates	Smp	0.1100		SUR: DoA(low), insuff sample,NCM
31	WG27006-004	05-Aug-2021 18:22:48	080521036.d	Client	FP-16E	Soil	1	10751	Surrogates	Smp	0.1100		
32	WG30020-003	05-Aug-2021 18:33:22	080521037.d	Client	AFFF01-SW04-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		
33	WG30020-002	05-Aug-2021 18:43:57	080521038.d	Client	AFFF01-SW03-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		
34	WG30020-002MS	05-Aug-2021 18:54:33	080521039.d	MS		Aqueous	1	10747	Analytes	100x PDS	0.2000		
35	WG24008-001	05-Aug-2021 19:05:12	080521040.d	Client	AOPC20-SW01-EF-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		
36	WG24008-006	05-Aug-2021 19:15:51	080521041.d	Client	AOPC15-SW01-IN-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
37	WG24009-009	05-Aug-2021 19:26:28	080521042.d	Client	AOPC17,21-EXW-4-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
38	WG24009-010	05-Aug-2021 19:37:05	080521043.d	Client	AOPC18-A-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
39	WG30020-011	05-Aug-2021 19:47:44	080521044.d	Client	AFFF01-SB13-01-072921-00	Soil	5	10645	Surrogates	Smp	0.1100		
40	WG24009-007	05-Aug-2021 19:58:23	080521045.d	Client	AOPC1,6,7-14C60A-072221	Aqueous	5	10417	Surrogates	Smp	0.1100		
41	ID CCV 1000A_SVLC-1600	05-Aug-2021 20:09:03	080521046.d	CCV					Analytes	L-5	1.00		
42	CCB 2	05-Aug-2021 20:19:42	080521047.d	InstBlk					Surrogates	Smp	0.1100		
43	WG24008-002	05-Aug-2021 20:30:19	080521048.d	Client	AOPC13-SW01-IN-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		
44	WG24009-003	05-Aug-2021 20:41:01	080521049.d	Client	AOPC5-14D28A-072221	Aqueous	20	10417	Surrogates	Smp	0.1100		

Report Date: 06-Aug-2021 18:04:57 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
45	WG24009-004	05-Aug-2021 20:51:40	080521050.d	Client	AOPC5-14D36A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		
46	WG24009-006	05-Aug-2021 21:02:17	080521051.d	Client	AOPC6-14D02A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		
50	WG29024-001	05-Aug-2021 21:44:57	080521055.d	Client	PFAS in Soil	Soil	1	10561	Surrogates	Smp	0.1100		
58	ID CCV 1000B_SVLC-1600	05-Aug-2021 23:10:09	080521063.d	CCV					Analytes	L-5	1.00		
59	CCB 3	05-Aug-2021 23:20:49	080521064.d	InstBlk					Surrogates	Smp	0.1100		
60	WQ11064-001	05-Aug-2021 23:31:28	080521065.d	MBlk		Soil	1	11064	Surrogates	Smp	0.1100		
61	WQ11064-002	05-Aug-2021 23:42:07	080521066.d	LCS		Soil	1	11064	Analytes	100x PDS	0.1000		
64	WG29007-011	06-Aug-2021 00:14:04	080521069.d	Client	AFFF21-SB01-00-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		
65	WG31020-011	06-Aug-2021 00:24:41	080521070.d	Client	AFFF01-SB14-02-073021-00	Soil	1	11064	Surrogates	Smp	0.1100		
66	WG29007-012	06-Aug-2021 00:35:19	080521071.d	Client	AFFF21-SB01-09-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		
67	WG29007-013	06-Aug-2021 00:45:58	080521072.d	Client	AFFF21-SB01-09-072821-01	Soil	1	10498	Surrogates	Smp	0.1100		
68	WG29007-014	06-Aug-2021 00:56:43	080521073.d	Client	AFFF21-SB01-12-072821-01	Soil	1	10561	Surrogates	Smp	0.1100		
74	ID CCV 1000_SVLC-1600	06-Aug-2021 02:00:13	080521079.d	CCV					Analytes	L-5	1.00		
75	WH03021-001	06-Aug-2021 02:10:59	080521080.d	Client	AFFF01-SB23-01-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-5X
76	WH03021-001	06-Aug-2021 02:21:39	080521081.d	Client	AFFF01-SB23-01-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
77	WH03022-017	06-Aug-2021 02:32:19	080521082.d	Client	AFFF01-SB20-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
78	WH03022-027	06-Aug-2021 02:42:59	080521083.d	Client	AFFF01-SB03-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-5X
79	WH03022-028	06-Aug-2021 02:53:39	080521084.d	Client	AFFF01-SB03-05-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
80	WH03022-029	06-Aug-2021 03:04:24	080521085.d	Client	AFFF01-SB03-11-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
81	WH03022-018	06-Aug-2021 03:15:04	080521086.d	Client	AFFF01-SB20-12-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
82	WH03022-019	06-Aug-2021 03:25:38	080521087.d	Client	AFFF01-SB20-12-080221-01	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
83	WH03022-020	06-Aug-2021 03:36:09	080521088.d	Client	AFFF01-SB20-16-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
84	WH03022-021	06-Aug-2021 03:46:48	080521089.d	Client	AFFF01-SB21-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
85	WH03022-022	06-Aug-2021 03:57:20	080521090.d	Client	AFFF01-SB21-13-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
86	WH03022-023	06-Aug-2021 04:07:53	080521091.d	Client	AFFF01-SB21-24-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
87	WH03022-024	06-Aug-2021 04:18:28	080521092.d	Client	AFFF01-SB16-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
88	WH03022-025	06-Aug-2021 04:29:10	080521093.d	Client	AFFF01-SB16-10-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
89	WH03022-026	06-Aug-2021 04:39:45	080521094.d	Client	AFFF01-SB16-15-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		

Pace Environmental Services, LLC
Analyte Quantitation Report

SAMPLE CALC PFBS REPORTED RESULT 7.9 ng/L

((39532 * 1000) / 142589) / 1.292942 = 214.43

214.43 * 1 * 0.037 = 7.9339 ng/L

Data File:	\\Organics\LL\LCMSMS02.i\073121-DOD.b\073121046.d		
Injection Date:	31-Jul-2021 19:59:43	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	39
Lab Sample ID:	WG24009-001	Lab Prep. Batch:	10417
Client ID:	AOPC22-10J02A-072221	Sample Group:	WG24009
Sample Info:	WG24009-001	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker
Final Conc.:	Amt * DF * CF	Matrix/Level:	Aqueous

Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0370000

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	297	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.699	1	520039	20	>100:1			1001.00	943.13	82.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.705	0/-1	46900	21	37:1			93.620	3.4639		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.067	0	474472	14	>100:1			1001.00	918.92	81.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.067		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	0	142589	14	>100:1			1001.00	821.53	78.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.120	1/1	39532	14	63:1	Target = 3.51		214.64	7.9418		
298.9 > 99	44	2.120	2.120		12307	14	69:1	3.21 (1.75-5.27)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.460	2.451	1/1	15734	13	79:1	Target = 2.74		118.18	4.3725		
349 > 99	44	2.460	2.451		5564	14	48:1	2.82 (1.37-4.11)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.389	2.380	1	105073	16	>100:1			5005.00	5270.55	96.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.380		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.425	2.425	0	547287	17	>100:1			1001.00	907.50	81.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.425		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.541	2.541	0	1039302	16	>100:1			5005.00	4880.02	82.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.541		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.800	2.791	1	427581	16	>100:1			1001.00	881.64	79	

TETRA TECH

INTERNAL CORRESPONDENCE

TO: D. WILSON **DATE:** OCTOBER 6, 2021

FROM: GLORIA SCHIFINO **COPIES:** DV FILE

SUBJECT: **ORGANIC DATA VALIDATION – PER & POLYFLUOROALKYL SUBSTANCES (PFAS), NASA AMES**
SAMPLE DELIVERY GROUP (SDG) WG31010

SAMPLES: 8/ Aqueous samples

AOPC1-WU4-25-072921	AOPC2,26-PFAS-C-072921
AOPC2-PFAS-E-072921	AOPC2-PFAS-F-072921
AOPC2-PFAS-F-072921-FD	ERB-02-072921
ERB-03-072921	FB-16-072921

Overview

The sample set for NASA Ames, SDG WG31010 consisted of eight (8) aqueous samples. All samples were analyzed for PFAS. One (1) field duplicate sample pair (AOPC2-PFAS-F-072921/AOPC2-PFAS-F-072921-FD) was included in this SDG.

The samples were collected by Tetra Tech, Inc. on July 29, 2021 and analyzed by Pace Analytical. The analyses were conducted in compliance with Department of Defense (DoD)/Department of Energy (DOE) for Environmental Laboratories version 5.3 PFAS using LC/MS/MS (May 2019). The data contained in this SDG was validated via Stage 2B:

*	• Data completeness
*	• Hold times/Sample Preservation
*	• Mass Calibration
*	• LC/MS/MS System Tuning and Performance
*	• Mass Spectral Acquisition Rate
*	• Instrument Sensitivity Check
*	• Ion Transition Check
*	• Initial/Continuing Calibrations
	• Laboratory Method/Preparation and Field Blank Results
*	• Field Reagent Blank Results
*	• Extraction Internal Standard Recoveries
*	• Injection Internal Standard Recoveries
*	• Laboratory Control Sample Recoveries
	• Field Duplicate Precision
*	• Compound Identification
*	• Compound Quantitation
*	• Matrix spike/matrix spike duplicate recoveries

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, and documentation supporting these findings is presented in Appendix C.

PFAS

The following compound was detected in the procedural blank on extracted on 8/12/2021 for all samples associated with batch number 11942 at the following maximum concentration.

Compound	Concentration	Action Level Limit of Quantitation LOQ) > or <
6:2 FTS	3.4 ng/L	<LOQ

The detected results reported < 5x the blank concentration were qualified as estimated (J+).

Field duplicate imprecision greater than 30% relative percent difference was present for sample pair (PFAS04-FD01-052021/ PFAS04-SB104-0002-052021) for PFOS. The detected results were qualified as estimated (J).

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

Additional Comments

Equipment blank sample ERB-02-072921 was not used for blank action assessment because there is evidence of laboratory contamination that affected the blank. All 28 PFAS compounds were detected in this blank. Other blanks in this SDG such as the batch method blank, ERB-03-072921 and FB-16-072921 did not contain any contamination. We suspected blank contamination so we requested that the laboratory re-analyze the blank again and we also requested that the lab re-extract and re-analyze the remaining volume of the blank. When we received the results from the lab on 10/1/21, the re-analysis of the blank ERB-02-072921 was comparable (28 detected PFAS compounds) to the initial results and the re-extracted blank did not contain any contamination. Therefore, we have concluded that the laboratory contaminated the blank either during sample preparation or analysis because the re-extracted blank did not contain any contamination. All internal standard recoveries met control limits in the re-extracted sample. Contamination in the initial analysis was not used to assess the potential of field contamination.

The following labeled extraction internal standard recovery 4:2 FTS was >150% quality control limit for sample AOPC1-WU4-25-072921. No validation because the sample result was nondetected.

Detected results reported below the LOQ but above the Detection Limit (DL) were qualified as estimated, (J).

Non-detected results were reported to the LOD.

Executive Summary

Laboratory Performance Issues: One analyte was detected on the procedural blank.

Other Factors Affecting Data Quality: Detected results below the LOQ were estimated.
Field duplicate imprecision the relative percent difference was greater than 30% the reporting limit for sample pair (PFAS04-FD01-052021/ PFAS04-SB104-0002-052021) for PFOS.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled “Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis be QSM Table B15” (May 2020). The text of this report has been formulated to address only those areas affecting data quality.

Tetra Tech, Inc.
Gloria Schifino
Chemist/Data Validator

for

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

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

Data Qualifier Definitions

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

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

Appendix A

Qualified Analytical Results

Qualifier Codes:

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

PROJ_NO: 09033A	NSAMPLE	AOPC1-WU4-25-072921			AOPC2,26-PFAS-C-072921			AOPC2-PFAS-E-072921			AOPC2-PFAS-F-072921		
SDG: WG31010	LAB_ID	WG31010-002			WG31010-001			WG31010-005			WG31010-006		
FRACTION: PFAS	SAMP_DATE	7/29/2021			7/29/2021			7/29/2021			7/29/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.5	U		3.4	U		3.8	U		3.5	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.5	U		3.4	U		3.8	U		3.5	U	
4:2 FLUOROTELOMER SULFONATE		3.5	U		3.4	U		3.8	U		3.5	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		17			13	J+	A	3.8	U		4.5	J	P
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.5	U		3.4	U		3.8	U		3.5	U	
9CL-PF3ONS		3.5	U		3.4	U		3.8	U		3.5	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.5	U		3.4	U		3.8	U		3.5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.5	U		3.4	U		3.8	U		3.5	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.5	U		3.4	U		3.8	U		3.5	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		27			4.6			4.4			1.8	J	P
PERFLUOROBUTANESULFONIC ACID (PFBS)		7			9			8.7			6.4		
PERFLUOROBUTANOIC ACID (PFBA)		5.2			7.2			9.4			2.5	J	P
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U		1.7	U		1.9	U		1.7	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U		1.7	U		1.9	U		1.7	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U		1.7	U		1.9	U		1.7	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.2	J	P	0.89	J	P	1.9	U		1.7	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		5.8			1.7	U		1.9	U		1.7	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		55			23			15			18		
PERFLUOROHEXANOIC ACID (PFHXA)		13			1.3	J	P	2.7	J	P	1.7	U	
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U		1.7	U		1.9	U		1.7	U	
PERFLUORONONANOIC ACID (PFNA)		1.8	U		1.7	U		1.9	U		1.3	J	P
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.8	U		1.7	U		1.9	U		1.7	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		13			35			4			11	J	G
PERFLUOROPENTANESULFONIC ACID (PFPES)		6.1			2.6	J	P	3.2	J	P	2.4	J	P

PROJ_NO: 09033A	NSAMPLE	AOPC2-PFAS-F-072921-FD			ERB-02-072921			ERB-03-072921			FB-16-072921		
SDG: WG31010	LAB_ID	WG31010-007			WG31010-003			WG31010-004			WG31010-008		
FRACTION: PFAS	SAMP_DATE	7/29/2021			7/29/2021			7/29/2021			7/29/2021		
MEDIA: WATER	QC_TYPE	FD			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	AOPC2-PFAS-F-072921											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.6	U		2.5	J	P	3.6	U		3.5	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.6	U		3.7	J	P	3.6	U		3.5	U	
4:2 FLUOROTELOMER SULFONATE		3.6	U		4.8	J	P	3.6	U		3.5	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		4.5	J	P	770			3.6	U		3.5	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.6	U		3.7	J	P	3.6	U		3.5	U	
9CL-PF3ONS		3.6	U		3.4	J	P	3.6	U		3.5	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.6	U		8.3			3.6	U		3.5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.6	U		3.1	J	P	3.6	U		3.5	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.6	U		3.8	J	P	3.6	U		3.5	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.7	J	P	75			1.8	U		1.8	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		8.7			5.5			1.8	U		1.8	U	
PERFLUOROBUTANOIC ACID (PFBA)		3.2	J	P	43			1.8	U		1.8	U	
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U		2.1	J	P	1.8	U		1.8	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U		4			1.8	U		1.8	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U		3.3	J	P	1.8	U		1.8	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.8	U		6.6			1.8	U		1.8	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		1.8	U		24			1.8	U		1.8	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		23			35			1.8	U		1.8	U	
PERFLUOROHEXANOIC ACID (PFHXA)		1.8	U		89			1.8	U		1.8	U	
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U		3.3	J	P	1.8	U		1.8	U	
PERFLUORONONANOIC ACID (PFNA)		1.9	J	P	4.4			1.8	U		1.8	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.8	U		4.1			1.8	U		1.8	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		15	J	G	280			1.8	U		1.8	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		2.9	J	P	6.2			1.8	U		1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC1-WU4-25-072921			AOPC2,26-PFAS-C-072921			AOPC2-PFAS-E-072921			AOPC2-PFAS-F-072921		
SDG: WG31010	LAB_ID	WG31010-002			WG31010-001			WG31010-005			WG31010-006		
FRACTION: PFAS	SAMP_DATE	7/29/2021			7/29/2021			7/29/2021			7/29/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		12			1.1	J	P	1.1	J	P	1.7	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U		1.7	U		1.9	U		1.7	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U		1.7	U		1.9	U		1.7	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U		1.7	U		1.9	U		1.7	U	

PROJ_NO: 09033A	NSAMPLE	AOPC2-PFAS-F-072921-FD			ERB-02-072921			ERB-03-072921			FB-16-072921		
SDG: WG31010	LAB_ID	WG31010-007			WG31010-003			WG31010-004			WG31010-008		
FRACTION: PFAS	SAMP_DATE	7/29/2021			7/29/2021			7/29/2021			7/29/2021		
MEDIA: WATER	QC_TYPE	FD			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	AOPC2-PFAS-F-072921											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.8	U		190			1.8	U		1.8	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U		1.6	J	P	1.8	U		1.8	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U		2.1	J	P	1.8	U		1.8	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U		4			1.8	U		1.8	U	

Appendix B

Results as Reported by the Laboratory

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-001
Description: AOPC2,26-PFAS-C-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1100
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 1934	JJG	08/12/2021 1336	11942

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	13	B	6.8	3.4	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.0		3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.89	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.6	J	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	23		3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	7.2		3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.3	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.6		3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	35		3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		131	50-150
13C2_6:2FTS		121	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		86	50-150
13C7_PFUdA		79	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-001
Description: AOPC2,26-PFAS-C-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1100
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-002
Description: AOPC1-WU4-25-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1220
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 1945	JJG	08/12/2021 1336	11942

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	17	B	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	UQ	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.0		3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.2	J	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	6.1		3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	55		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	5.2		3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	5.8		3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	13		3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	27		3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	12		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	13		3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	173	50-150
13C2_6:2FTS		114	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		104	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		96	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-002
Description: AOPC1-WU4-25-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1220
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	50-150
13C8_PFOS		96	50-150
13C8_PFOSA		96	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-003
Description: ERB-02-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1630
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2235	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	J	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	PFAS by ID SOP	2.5	J	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	J	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	770		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.8	J	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	8.3		7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	J	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.1	J	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	J	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.5		3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	J	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	6.6		3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.3	J	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	4.1		3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	6.2		3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	35		3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	43		3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	4.0		3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	3.3	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	24		3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	89		3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	4.4		3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	75		3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190		3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.6	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	4.0		3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	280		3.8	1.9	0.96	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		110	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		69	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		109	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		89	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-003
Description: ERB-02-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1630		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	50-150
13C8_PFOS		100	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		102	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-004
Description: ERB-03-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1645
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2246	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		118	50-150
13C2_6:2FTS		129	50-150
13C2_8:2FTS		113	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		98	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		113	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		108	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		101	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-004
Description: ERB-03-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1645		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		111	50-150
13C8_PFOS		106	50-150
13C8_PFOSA		97	50-150
13C9_PFNA		106	50-150
d5-EtFOSAA		110	50-150
d3-MeFOSAA		109	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-005
Description: AOPC2-PFAS-E-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1445
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/21/2021 0439	JJG	08/18/2021 1159	12470

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.7		3.8	1.9	0.95	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.2	J	3.8	1.9	0.95	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	15		3.8	1.9	0.95	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.4		3.8	1.9	0.95	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.7	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	4.4		3.8	1.9	0.95	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.0		3.8	1.9	0.95	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		110	50-150
13C2_6:2FTS		114	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		56	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		83	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-005
Description: AOPC2-PFAS-E-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1445
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		98	50-150
13C8_PFOS		73	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-006
Description: AOPC2-PFAS-F-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1525
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2257	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.5	J	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.4		3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.4	J	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	18		3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.5	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.3	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	11		3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		147	50-150
13C2_6:2FTS		140	50-150
13C2_8:2FTS		146	50-150
13C2_PFDoA		117	50-150
13C2_PFTeDA		113	50-150
13C3_PFBS		126	50-150
13C3_PFHxS		133	50-150
13C3-HFPO-DA		135	50-150
13C4_PFBA		128	50-150
13C4_PFHpA		136	50-150
13C5_PFHxA		121	50-150
13C5_PFPeA		130	50-150
13C6_PFDA		113	50-150
13C7_PFUdA		121	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-006
Description: AOPC2-PFAS-F-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1525
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		122	50-150
13C8_PFOS		118	50-150
13C8_PFOSA		127	50-150
13C9_PFNA		129	50-150
d5-EtFOSAA		121	50-150
d3-MeFOSAA		127	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-007
Description: AOPC2-PFAS-F-072921-FD
Matrix: Aqueous
Date Sampled: 07/29/2021 1525
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2307	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.5	J	7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	8.7		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.9	J	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	23		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	15		3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		116	50-150
13C2_6:2FTS		108	50-150
13C2_8:2FTS		120	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		90	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		107	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		107	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		95	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-007
Description: AOPC2-PFAS-F-072921-FD
Matrix: Aqueous
Date Sampled: 07/29/2021 1525
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-008
Description: FB-16-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1700
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2318	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		113	50-150
13C2_6:2FTS		108	50-150
13C2_8:2FTS		120	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		106	50-150
13C3-HFPO-DA		110	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		95	50-150
13C7_PFUdA		97	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-008
Description: FB-16-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1700		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Appendix C

Support Documentation

ANALYTE	ORIGINAL AOPC2-PFAS-F-072921	DUPLICATE AOPC2-PFAS-F-072921-FD	RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
6:2 FLUOROTELOMER SULFONATE (6:2FTS)	4.5	4.5	6.9	0.00	FALSE	FALSE	FALSE	FALSE
PENTADECAFLUOROOCTANOIC ACID (PFOA)	1.8	1.7	3.4	5.71	FALSE	FALSE	FALSE	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	6.4	8.7	3.4	30.46	TRUE	FALSE	TRUE	FALSE
PERFLUOROBUTANOIC ACID (PFBA)	2.5	3.2	3.4	24.56	FALSE	FALSE	FALSE	FALSE
PERFLUOROHEXANESULFONIC ACID (PFHXS)	18	23	3.4	24.39	FALSE	TRUE	TRUE	FALSE
PERFLUORONONANOIC ACID (PFNA)	1.3	1.9	3.4	37.50	TRUE	FALSE	FALSE	FALSE
PERFLUOROOCTANESULFONIC ACID (PFOS)	11	15	3.4	30.77	TRUE	TRUE	TRUE	FALSE
PERFLUOROPENTANESULFONIC ACID (PFPES)	2.4	2.9	3.4	18.87	FALSE	FALSE	FALSE	FALSE

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122463

Client: Tetra Tech	Report Information: Mike Dahlquist	Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com
Address: 1999 Harrison St	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)
City: Oakland State: CA Zip Code: 94612	Printed Name: Callie Neaves, Anya Mikheicheva	Page 1 of 1
Project Name: NASA ARC PFAS		
Project No.: 103IG667601	P.O. No.	

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab / Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Air-Gaseous	No. of Containers by Preservative Type: Unpres.	HNO3	H2SO4	HCl	NaOH	ZnOAc/NaOH	Field Filtered	PFAS (QSM B-15)	Remarks / Cooler I.D.
AOPC2,26-PFAS-C-072921	7/29/21	1100	G	X			2							X	
AOPC1-WW4-25-072921	7/29/21	1220	G	X			2							X	
ERB-02-072921	7/29/21	1630	G	X			2							X	
ERB-03-072921	7/29/21	1645	G	X			2							X	
AOPC2-PFAS-E-072921	7/29/21	1445	G	X			6							X	MS/MSD
AOPC2-PFAS-F-072921	7/29/21	1525	G	X			2							X	
AOPC2-PFAS-F-072921-FD	7/29/21	1525	G	X			2							X	Field duplicate
FB-16-072921	7/29/21	1700	G	X			2							X	

WG31010
KES2

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☐ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves TE [signature]	7/30/21	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/31/21	0905	4. Laboratory received by: [signature]	7/31/21	0905

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack
Receipt Temp 4.1 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Case Narrative
Tetra Tech
Lot Number: WG31010

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Samples WG31010-005 (parent, MS, and MSD) required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

The method blank associated with batch 11942 had 6:2 FTS detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for 6:2 FTS have been flagged with a "B".

Sample WG31010-002 had the surrogate 4:2FTS recovered above the acceptance limits. This reflects a high bias for compounds associated with this surrogate. There were no detections for these compounds in the sample; therefore, there is no impact on data quality and no corrective action is required.

Sample Summary
Tetra Tech
Lot Number: WG31010
Project Name: NASA ARC PFAS
Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC2,26-PFAS-C-072921	Aqueous	07/29/2021 1100	07/31/2021
002	AOPC1-WU4-25-072921	Aqueous	07/29/2021 1220	07/31/2021
003	ERB-02-072921	Aqueous	07/29/2021 1630	07/31/2021
004	ERB-03-072921	Aqueous	07/29/2021 1645	07/31/2021
005	AOPC2-PFAS-E-072921	Aqueous	07/29/2021 1445	07/31/2021
006	AOPC2-PFAS-F-072921	Aqueous	07/29/2021 1525	07/31/2021
007	AOPC2-PFAS-F-072921-FD	Aqueous	07/29/2021 1525	07/31/2021
008	FB-16-072921	Aqueous	07/29/2021 1700	07/31/2021

(8 samples)

PFAS by LC/MS/MS - MB

Sample ID: WQ11942-001
Batch: 11942
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1336

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
6:2 FTS	3.4	J	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/13/2021 2207
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/13/2021 2207

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	50-150
13C2_6:2FTS		98	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		76	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		89	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ11942-001
Batch: 11942
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1336

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		89	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		80	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ11942-002
Batch: 11942
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1336

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	97	70-150	08/13/2021 2218
11Cl-PF3OUdS	15	15		1	99	70-150	08/13/2021 2218
8:2 FTS	15	15		1	99	67-138	08/13/2021 2218
6:2 FTS	15	21		1	136	64-140	08/13/2021 2218
4:2 FTS	15	15		1	102	63-143	08/13/2021 2218
GenX	32	34		1	106	70-150	08/13/2021 2218
ADONA	15	17		1	112	70-150	08/13/2021 2218
EtFOSAA	16	15		1	95	61-135	08/13/2021 2218
MeFOSAA	16	15		1	95	65-136	08/13/2021 2218
PFBS	14	14		1	101	72-130	08/13/2021 2218
PFDS	15	17		1	110	53-142	08/13/2021 2218
PFHpS	15	17		1	113	69-134	08/13/2021 2218
PFNS	15	16		1	106	69-127	08/13/2021 2218
PFOSA	16	17		1	106	67-137	08/13/2021 2218
PFPeS	15	15		1	103	71-127	08/13/2021 2218
PFHxS	15	16		1	107	68-131	08/13/2021 2218
PFBA	16	17		1	108	73-129	08/13/2021 2218
PFDA	16	17		1	105	71-129	08/13/2021 2218
PFDoA	16	19		1	118	72-134	08/13/2021 2218
PFHpA	16	16		1	99	72-130	08/13/2021 2218
PFHxA	16	17		1	107	72-129	08/13/2021 2218
PFNA	16	16		1	100	69-130	08/13/2021 2218
PFOA	16	17		1	107	71-133	08/13/2021 2218
PFPeA	16	17		1	107	72-129	08/13/2021 2218
PFTeDA	16	18		1	113	71-132	08/13/2021 2218
PFTrDA	16	18		1	114	65-144	08/13/2021 2218
PFUdA	16	16		1	103	69-133	08/13/2021 2218
PFOS	15	18		1	120	65-140	08/13/2021 2218

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		96	50-150
13C2_6:2FTS		90	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ11942-002
Batch: 11942
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1336

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		81	50-150
13C7_PFUdA		82	50-150
13C8_PFOA		91	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12002-001
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12002-001
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		96	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12002-002
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	100	70-150	08/14/2021 2153
11Cl-PF3OUdS	15	13		1	88	70-150	08/14/2021 2153
8:2 FTS	15	16		1	107	67-138	08/14/2021 2153
6:2 FTS	15	17		1	114	64-140	08/14/2021 2153
4:2 FTS	15	17		1	117	63-143	08/14/2021 2153
GenX	32	33		1	104	70-150	08/14/2021 2153
ADONA	15	17		1	112	70-150	08/14/2021 2153
EtFOSAA	16	15		1	97	61-135	08/14/2021 2153
MeFOSAA	16	18		1	114	65-136	08/14/2021 2153
PFBS	14	15		1	105	72-130	08/14/2021 2153
PFDS	15	12		1	75	53-142	08/14/2021 2153
PFHpS	15	17		1	110	69-134	08/14/2021 2153
PFNS	15	16		1	102	69-127	08/14/2021 2153
PFOSA	16	16		1	102	67-137	08/14/2021 2153
PFPeS	15	15		1	100	71-127	08/14/2021 2153
PFHxS	15	15		1	100	68-131	08/14/2021 2153
PFBA	16	17		1	109	73-129	08/14/2021 2153
PFDA	16	17		1	104	71-129	08/14/2021 2153
PFDoA	16	19		1	118	72-134	08/14/2021 2153
PFHpA	16	17		1	106	72-130	08/14/2021 2153
PFHxA	16	16		1	103	72-129	08/14/2021 2153
PFNA	16	17		1	104	69-130	08/14/2021 2153
PFOA	16	17		1	108	71-133	08/14/2021 2153
PFPeA	16	17		1	105	72-129	08/14/2021 2153
PFTeDA	16	18		1	112	71-132	08/14/2021 2153
PFTrDA	16	17		1	108	65-144	08/14/2021 2153
PFUdA	16	19		1	119	69-133	08/14/2021 2153
PFOS	15	15		1	99	65-140	08/14/2021 2153

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		58	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12002-002
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		90	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12470-001
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		86	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12470-001
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		86	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12470-002
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	104	70-150	08/20/2021 2050
11Cl-PF3OUdS	15	14		1	91	70-150	08/20/2021 2050
8:2 FTS	15	17		1	110	67-138	08/20/2021 2050
6:2 FTS	15	15		1	97	64-140	08/20/2021 2050
4:2 FTS	15	13		1	89	63-143	08/20/2021 2050
GenX	32	30		1	94	70-150	08/20/2021 2050
ADONA	15	18		1	117	70-150	08/20/2021 2050
EtFOSAA	16	14		1	90	61-135	08/20/2021 2050
MeFOSAA	16	15		1	92	65-136	08/20/2021 2050
PFBS	14	14		1	97	72-130	08/20/2021 2050
PFDS	15	16		1	104	53-142	08/20/2021 2050
PFHpS	15	16		1	103	69-134	08/20/2021 2050
PFNS	15	16		1	104	69-127	08/20/2021 2050
PFOSA	16	17		1	107	67-137	08/20/2021 2050
PFPeS	15	15		1	103	71-127	08/20/2021 2050
PFHxS	15	15		1	101	68-131	08/20/2021 2050
PFBA	16	16		1	99	73-129	08/20/2021 2050
PFDA	16	18		1	110	71-129	08/20/2021 2050
PFDoA	16	18		1	111	72-134	08/20/2021 2050
PFHpA	16	17		1	108	72-130	08/20/2021 2050
PFHxA	16	17		1	105	72-129	08/20/2021 2050
PFNA	16	17		1	105	69-130	08/20/2021 2050
PFOA	16	17		1	105	71-133	08/20/2021 2050
PFPeA	16	16		1	102	72-129	08/20/2021 2050
PFTeDA	16	16		1	102	71-132	08/20/2021 2050
PFTrDA	16	16		1	99	65-144	08/20/2021 2050
PFUdA	16	17		1	109	69-133	08/20/2021 2050
PFOS	15	15		1	102	65-140	08/20/2021 2050

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12470-002
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		92	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG31010-005MS
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	13		1	89	70-150	08/21/2021 0450
11Cl-PF3OUdS	ND	14	12		1	81	70-150	08/21/2021 0450
8:2 FTS	ND	15	13		1	92	67-138	08/21/2021 0450
6:2 FTS	ND	14	17		1	115	64-140	08/21/2021 0450
4:2 FTS	ND	14	12		1	87	63-143	08/21/2021 0450
GenX	ND	30	28		1	91	70-150	08/21/2021 0450
ADONA	ND	14	15		1	103	70-150	08/21/2021 0450
EtFOSAA	ND	15	13		1	89	61-135	08/21/2021 0450
MeFOSAA	ND	15	14		1	95	65-136	08/21/2021 0450
PFBS	8.7	13	21		1	92	72-130	08/21/2021 0450
PFDS	ND	15	14		1	92	53-142	08/21/2021 0450
PFHpS	ND	14	14		1	95	69-134	08/21/2021 0450
PFNS	ND	15	14		1	98	69-127	08/21/2021 0450
PFOSA	ND	15	14		1	90	67-137	08/21/2021 0450
PFPeS	3.2	14	16		1	92	71-127	08/21/2021 0450
PFHxS	15	14	30		1	106	68-131	08/21/2021 0450
PFBA	9.4	15	24		1	97	73-129	08/21/2021 0450
PFDA	ND	15	16		1	103	71-129	08/21/2021 0450
PFDoA	ND	15	15		1	100	72-134	08/21/2021 0450
PFHpA	ND	15	15		1	99	72-130	08/21/2021 0450
PFHxA	2.7	15	17		1	95	72-129	08/21/2021 0450
PFNA	ND	15	17		1	109	69-130	08/21/2021 0450
PFOA	4.4	15	20		1	105	71-133	08/21/2021 0450
PFPeA	1.1	15	16		1	95	72-129	08/21/2021 0450
PFTeDA	ND	15	15		1	101	71-132	08/21/2021 0450
PFTrDA	ND	15	15		1	97	65-144	08/21/2021 0450
PFUdA	ND	15	18		1	117	69-133	08/21/2021 0450
PFOS	4.0	14	18		1	101	65-140	08/21/2021 0450

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		128	50-150
13C2_6:2FTS		135	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		71	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		105	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG31010-005MS
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		100	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG31010-005MD
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	14	13		1	91	2.7	70-150	30	08/21/2021 0501
11Cl-PF3OUdS	ND	14	12		1	82	1.9	70-150	30	08/21/2021 0501
8:2 FTS	ND	15	11		1	76	19	67-138	30	08/21/2021 0501
6:2 FTS	ND	14	15		1	101	13	64-140	30	08/21/2021 0501
4:2 FTS	ND	14	13		1	88	1.7	63-143	30	08/21/2021 0501
GenX	ND	31	26		1	86	5.5	70-150	30	08/21/2021 0501
ADONA	ND	14	16		1	110	6.9	70-150	30	08/21/2021 0501
EtFOSAA	ND	15	13		1	86	2.9	61-135	30	08/21/2021 0501
MeFOSAA	ND	15	16		1	107	13	65-136	30	08/21/2021 0501
PFBS	8.7	13	23		1	104	7.9	72-130	30	08/21/2021 0501
PFDS	ND	15	13		1	92	0.36	53-142	30	08/21/2021 0501
PFHpS	ND	15	13		1	92	2.8	69-134	30	08/21/2021 0501
PFNS	ND	15	13		1	89	9.2	69-127	30	08/21/2021 0501
PFOSA	ND	15	14		1	91	1.2	67-137	30	08/21/2021 0501
PFPeS	3.2	14	18		1	104	9.9	71-127	30	08/21/2021 0501
PFHxS	15	14	27		1	84	11	68-131	30	08/21/2021 0501
PFBA	9.4	15	24		1	96	0.46	73-129	30	08/21/2021 0501
PFDA	ND	15	14		1	90	13	71-129	30	08/21/2021 0501
PFDoA	ND	15	16		1	103	3.9	72-134	30	08/21/2021 0501
PFHpA	ND	15	15		1	96	2.8	72-130	30	08/21/2021 0501
PFHxA	2.7	15	19		1	108	11	72-129	30	08/21/2021 0501
PFNA	ND	15	15		1	99	8.9	69-130	30	08/21/2021 0501
PFOA	4.4	15	20		1	102	1.9	71-133	30	08/21/2021 0501
PFPeA	1.1	15	16		1	95	0.12	72-129	30	08/21/2021 0501
PFTeDA	ND	15	16		1	104	2.9	71-132	30	08/21/2021 0501
PFTrDA	ND	15	15		1	98	1.5	65-144	30	08/21/2021 0501
PFUdA	ND	15	15		1	100	15	69-133	30	08/21/2021 0501
PFOS	4.0	14	16		1	86	12	65-140	30	08/21/2021 0501

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		123	50-150
13C2_6:2FTS		136	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		105	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: WG31010-005MD
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		105	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31010

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC2,26-PFAS-C-072921	131	121	96	75	74	96	104	100	97
AOPC1-WU4-25-072921	173 *	114	98	88	79	97	96	102	104
ERB-02-072921	110	117	108	91	69	95	104	104	103
ERB-03-072921	118	129	113	96	98	103	99	113	103
AOPC2-PFAS-E-072921	110	114	90	74	56	89	80	97	95
AOPC2-PFAS-F-072921	147	140	146	117	113	126	133	135	128
AOPC2-PFAS-F-072921-FD	116	108	120	88	90	96	98	107	99
FB-16-072921	113	108	120	91	88	97	106	110	100
WQ11942-001	103	98	86	76	82	97	89	90	91
WQ11942-002	96	90	82	72	79	90	87	88	88
WQ12002-001	100	117	93	79	76	80	87	93	88
WQ12002-002	95	100	93	77	58	83	89	94	89
WQ12470-001	92	94	95	86	81	85	90	96	91
WQ12470-002	100	92	96	81	77	86	82	96	93
AOPC2-PFAS-E-072921MS	128	135	92	84	71	97	90	102	103
AOPC2-PFAS-E-072921MSD	123	136	98	83	70	94	87	105	103

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31010

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC2,26-PFAS-C-072921	96	101	104	86	79	97	86	86	
AOPC1-WU4-25-072921	102	104	108	83	96	97	96	96	
ERB-02-072921	109	96	94	94	89	94	100	100	
ERB-03-072921	108	105	103	92	101	111	106	97	
AOPC2-PFAS-E-072921	91	96	96	79	83	98	73	85	
AOPC2-PFAS-F-072921	136	121	130	113	121	122	118	127	
AOPC2-PFAS-F-072921-FD	99	99	107	94	95	98	94	100	
FB-16-072921	107	100	100	95	97	96	98	101	
WQ11942-001	93	90	89	87	77	89	82	88	
WQ11942-002	91	88	93	81	82	91	79	92	
WQ12002-001	93	86	90	83	85	96	81	88	
WQ12002-002	90	84	91	84	84	90	88	82	
WQ12470-001	91	98	91	86	92	93	88	90	
WQ12470-002	84	92	91	84	84	92	79	85	
AOPC2-PFAS-E-072921MS	96	99	105	87	78	100	79	88	
AOPC2-PFAS-E-072921MSD	97	96	101	92	86	105	79	91	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31010

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC2,26-PFAS-C-072921	95	83	83						0
AOPC1-WU4-25-072921	93	92	94						1
ERB-02-072921	102	94	106						0
ERB-03-072921	106	110	109						0
AOPC2-PFAS-E-072921	89	85	87						0
AOPC2-PFAS-F-072921	129	121	127						0
AOPC2-PFAS-F-072921-FD	101	92	103						0
FB-16-072921	98	93	100						0
WQ11942-001	80	96	86						0
WQ11942-002	86	94	88						0
WQ12002-001	94	89	87						0
WQ12002-002	93	83	92						0
WQ12470-001	94	90	98						0
WQ12470-002	89	95	96						0
AOPC2-PFAS-E-072921MS	88	93	98						0
AOPC2-PFAS-E-072921MSD	97	97	92						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 3
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31010

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): AOPC2-PFAS-E-072921

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2 Lab Sample ID: WG31010-005MS

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	SAMPLE CONCENTRATION	MS CONCENTRATION	MS %REC #	QC LIMITS REC.
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	14		13	89	70-150
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	14		12	81	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15		13	92	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	14		17	115	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	14		12	87	63-143
Hexafluoropropylene oxide dimer acid (GenX)	30		28	91	70-150
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	14		15	103	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	15		13	89	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	15		14	95	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	13	8.7	21	92	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15		14	92	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	14		14	95	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15		14	98	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	15		14	90	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	14	3.2	16	92	71-127
Perfluorohexanesulfonic acid (PFHxS)	14	15	30	106	68-131
Perfluoro-n-butanoic acid (PFBA)	15	9.4	24	97	73-129
Perfluoro-n-decanoic acid (PFDA)	15		16	103	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	15		15	100	72-134
Perfluoro-n-heptanoic acid (PFHpA)	15		15	99	72-130
Perfluoro-n-hexanoic acid (PFHxA)	15	2.7	17	95	72-129
Perfluoro-n-nonanoic acid (PFNA)	15		17	109	69-130
Perfluoro-n-octanoic acid (PFOA)	15	4.4	20	105	71-133
Perfluoro-n-pentanoic acid (PFPeA)	15	1.1	16	95	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	15		15	101	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	15		15	97	65-144
Perfluoro-n-undecanoic acid (PFUdA)	15		18	117	69-133
Perfluorooctanesulfonic acid (PFOS)	14	4	18	101	65-140

* Values outside of QC Limits

FORM 3
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31010

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): AOPC2-PFAS-E-072921

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2 Lab Sample ID: WG31010-005MS

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	MSD CONCENTRATION	MSD %R #	RPD #	QC LIMITS	
					RPD	%R
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	14	13	91	2.7	0-30	70-150
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	14	12	82	1.9	0-30	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	11	76	19	0-30	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	14	15	101	13	0-30	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	14	13	88	1.7	0-30	63-143
Hexafluoropropylene oxide dimer acid (GenX)	31	26	86	5.5	0-30	70-150
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	14	16	110	6.9	0-30	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	15	13	86	2.9	0-30	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	15	16	107	13	0-30	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	13	23	104	7.9	0-30	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	13	92	0.36	0-30	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	13	92	2.8	0-30	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	13	89	9.2	0-30	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	15	14	91	1.2	0-30	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	14	18	104	9.9	0-30	71-127
Perfluorohexanesulfonic acid (PFHxS)	14	27	84	11	0-30	68-131
Perfluoro-n-butanoic acid (PFBA)	15	24	96	0.46	0-30	73-129
Perfluoro-n-decanoic acid (PFDA)	15	14	90	13	0-30	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	15	16	103	3.9	0-30	72-134
Perfluoro-n-heptanoic acid (PFHpA)	15	15	96	2.8	0-30	72-130
Perfluoro-n-hexanoic acid (PFHxA)	15	19	108	11	0-30	72-129
Perfluoro-n-nonanoic acid (PFNA)	15	15	99	8.9	0-30	69-130
Perfluoro-n-octanoic acid (PFOA)	15	20	102	1.9	0-30	71-133
Perfluoro-n-pentanoic acid (PFPeA)	15	16	95	0.12	0-30	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	15	16	104	2.9	0-30	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	15	15	98	1.5	0-30	65-144
Perfluoro-n-undecanoic acid (PFUdA)	15	15	100	15	0-30	69-133
Perfluorooctanesulfonic acid (PFOS)	14	16	86	12	0-30	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31010

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ11942-002 Lab Sample ID: WQ11942-002

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	15	99	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	15	99	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	21	136	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	15	102	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	17	112	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	14	97	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	34	106	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	15	95	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	15	95	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	14	101	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	17	110	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	17	113	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	16	106	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	17	106	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	15	103	71-127
Perfluoro-n-butanoic acid (PFBA)	16	17	108	73-129
Perfluoro-n-decanoic acid (PFDA)	16	17	105	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	19	118	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	16	99	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	17	107	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	16	100	69-130
Perfluoro-n-octanoic acid (PFOA)	16	17	107	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	17	107	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	18	113	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	18	114	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	16	103	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	16	107	68-131
Perfluorooctanesulfonic acid (PFOS)	15	18	120	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31010

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ12002-002 Lab Sample ID: WQ12002-002

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	13	88	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	16	107	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	17	114	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	17	117	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	17	112	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	15	100	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	33	104	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	15	97	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	18	114	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	15	105	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	12	75	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	17	110	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	16	102	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	16	102	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	15	100	71-127
Perfluoro-n-butanoic acid (PFBA)	16	17	109	73-129
Perfluoro-n-decanoic acid (PFDA)	16	17	104	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	19	118	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	17	106	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	16	103	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	17	104	69-130
Perfluoro-n-octanoic acid (PFOA)	16	17	108	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	17	105	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	18	112	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	17	108	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	19	119	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	15	100	68-131
Perfluorooctanesulfonic acid (PFOS)	15	15	99	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31010

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ12470-002 Lab Sample ID: WQ12470-002

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	14	91	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	17	110	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	15	97	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	13	89	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	18	117	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	15	104	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	30	94	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	14	90	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	15	92	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	14	97	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	16	104	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	16	103	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	16	104	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	17	107	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	15	103	71-127
Perfluoro-n-butanoic acid (PFBA)	16	16	99	73-129
Perfluoro-n-decanoic acid (PFDA)	16	18	110	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	18	111	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	17	108	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	17	105	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	17	105	69-130
Perfluoro-n-octanoic acid (PFOA)	16	17	105	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	16	102	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	16	102	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	16	99	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	17	109	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	15	101	68-131
Perfluorooctanesulfonic acid (PFOS)	15	15	102	65-140

* Values outside of QC Limits

CLIENT SAMPLE ID

WQ11942-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG31010

Project No.: 103IG667601
Lab Sample ID: WQ11942-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 08/12/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 08/13/2021

Time Analyzed: 22:07

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC2,26-PFAS-C-072921	WG31010-001		19:34
AOPC1-WU4-25-072921	WG31010-002		19:45
WQ11942-002	WQ11942-002		22:18

CLIENT SAMPLE ID

WQ12002-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG31010

Project No.: 103IG667601
Lab Sample ID: WQ12002-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 08/12/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 08/14/2021

Time Analyzed: 21:42

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
ERB-02-072921	WG31010-003		22:35
ERB-03-072921	WG31010-004		22:46
AOPC2-PFAS-F-072921	WG31010-006		22:57
AOPC2-PFAS-F-072921-FD	WG31010-007		23:07
FB-16-072921	WG31010-008		23:18
WQ12002-002	WQ12002-002		21:53

CLIENT SAMPLE ID

WQ12470-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG31010

Project No.: 103IG667601
Lab Sample ID: WQ12470-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 08/18/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 08/20/2021

Time Analyzed: 20:40

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC2-PFAS-E-072921	WG31010-005		04:39
WQ12470-002	WQ12470-002		20:50
AOPC2-PFAS-E-072921MS	WG31010-005MS		04:50
AOPC2-PFAS-E-072921MSD	WG31010-005MD		05:01

Report Date: 21-Aug-2021 12:36:25 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	082021013.d	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13
2	082021014.d	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51
3	082021015.d	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26
4	082021016.d	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05
5	082021017.d	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39
6	082021018.d	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14
7	082021019.d	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48
8	082021020.d	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29
9	082021021.d	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07
10	082021022.d	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.674	3.098	3.207	3.181	3.700	3.492	3.392	3.468	3.459	3.469	3.414	3.103-4.296	0.19895	1.850
1 4:2 FTS	0.648	1.402	1.453	1.505	1.793	1.706	1.709	1.855	1.910	1.864	1.584	0.659-2.926	0.37794	0.896
15 PFHxA	20.986	15.528	19.135	19.396	20.319	18.078	17.821	18.757	18.646	18.310	18.697	16.050-24.587	1.42273	10.159
22 PFPeS	2.946	2.931	3.331	2.941	2.714	2.838	2.725	3.008	2.926	2.939	2.929	2.190-3.237	0.17448	1.357
28 GenX	0.815	0.731	0.763	0.743	0.823	0.819	0.754	0.783	0.812	0.777	0.782	0.720-0.925	0.03409	0.411
13 PFHpA	3.913	3.910	4.099	3.631	3.706	3.525	3.694	3.844	3.689	3.524	3.753	3.136-4.275	0.18967	1.853
14 PFHxS	2.174	2.674	2.378	2.771	2.791	3.159	2.804	2.919	3.171	3.103	2.794	1.814-3.767	0.32551	1.395
29 ADONA	3.404	3.407	3.136	3.256	3.551	3.102	3.342	2.990	2.945	2.990	3.212	2.938-4.163	0.20427	1.775
2 6:2 FTS	2.385	2.243	1.860	1.793	1.821	1.823	1.990	1.824	1.862	1.888	1.948	1.153-2.488	0.22243	0.910
20 PFOA	3.083	3.563	2.689	2.667	2.905	2.898	2.876	2.765	2.859	2.854	2.915	2.136-3.673	0.25624	1.452
12 PFHpS	4.119	2.659	2.819	2.909	2.932	2.919	2.980	3.058	3.004	2.914	3.031	1.756-4.107	0.39177	1.466
17 PFNA	5.828	7.144	6.483	6.705	6.621	7.065	6.594	5.987	6.222	6.192	6.484	5.346-7.895	0.42486	3.310
18 PFOS	3.257	3.567	3.186	3.034	3.590	3.369	3.434	3.520	3.395	3.459	3.381	3.055-4.124	0.17821	1.795
19 PFOSA	45.840	26.854	26.101	30.090	34.574	30.039	33.416	33.002	30.593	31.700	32.220	17.090-52.057	5.82797	17.287
16 PFNS	2.626	3.657	2.213	2.873	2.581	2.747	3.068	2.742	2.716	2.782	2.800	1.503-3.658	0.35918	1.290
10 PFDA	15.497	16.295	12.739	15.112	12.784	12.471	13.850	14.146	13.660	12.833	13.938	8.789-16.778	1.33162	6.392
3 8:2 FTS	Disabled	1.346	2.659	2.372	2.035	1.850	1.832	1.801	1.933	1.870	1.966	0.946-3.123	0.36272	1.017
6 N-MeFOSAA	1.431	1.017	1.552	1.319	1.311	1.304	1.305	1.329	1.302	1.325	1.319	0.837-1.784	0.15776	0.655
9 PFDS	4.458	4.488	2.960	3.444	2.714	2.635	2.726	2.847	2.649	2.635	3.155	0.393-5.034	0.77351	1.357
25 PFUdA	14.824	15.776	12.099	14.317	13.548	15.639	12.572	14.946	13.315	13.077	14.011	8.028-19.067	1.83987	6.774
5 N-EtFOSAA	2.128	2.098	1.982	1.796	1.614	1.547	1.652	1.554	1.611	1.518	1.750	0.828-2.399	0.26194	0.807
26 MeFOSA	1.340	1.171	0.871	1.056	0.844	1.022	0.976	1.034	1.080	1.054	1.044	0.418-1.269	0.14168	0.422
27 EtFOSA	1.520	0.917	1.067	1.004	1.019	1.035	0.992	1.023	0.949	0.989	1.051	0.494-1.543	0.17498	0.509
11 PFDoA	11.681	9.117	10.306	11.188	10.425	10.868	10.652	10.913	9.834	10.240	10.522	8.369-12.480	0.68511	5.212
4 10:2 FTS	3.903	4.201	3.007	2.534	3.743	3.280	3.163	3.289	3.034	3.325	3.347	2.348-5.137	0.46474	1.871
34 PFDOS	2.558	2.982	3.279	3.246	2.998	2.959	3.025	2.962	3.040	3.064	3.011	2.412-3.583	0.19506	1.499
24 PFTrDA	6.688	7.234	6.811	7.701	8.052	7.917	7.624	7.976	7.893	7.301	7.519	6.545-9.558	0.50222	4.026
23 PFTeDA	10.950	11.447	11.502	11.343	11.303	11.411	11.130	11.068	10.817	10.306	11.127	10.192-12.413	0.37024	5.651
35 PFHxDA	10.647	10.023	10.817	11.033	10.668	10.563	10.888	11.070	10.643	10.570	10.692	9.768-11.567	0.29977	5.334
36 PFODA	11.849	14.480	13.500	13.647	13.569	13.369	13.580	13.529	12.852	12.599	13.297	11.326-15.811	0.74751	6.784

Report Date: 21-Aug-2021 12:36:25 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	082021013.d	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13
2	082021014.d	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51
3	082021015.d	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26
4	082021016.d	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05
5	082021017.d	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39
6	082021018.d	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14
7	082021019.d	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48
8	082021020.d	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29
9	082021021.d	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07
10	082021022.d	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	617	632	620	606	612	610	587	564	585	578	Avg:A Wt:C2	601		RSD=3.6	
	102.7	105.1	103.1	100.8	101.8	101.6	97.7	93.9	97.3	96.2	Org:N Dep:R				
8 PFBA	1.128720	1.041643	1.049716	1.034108	1.067269	1.012516	1.096593	1.081459	0.995072	1.011554	Avg:A Wt:C2	1.051865		RSD=4.0	
	107.3	99	99.8	98.3	101.5	96.3	104.3	102.8	94.6	96.2	Org:N Dep:R				
D 50 13C5_PFPeA	642	646	636	641	630	639	616	571	597	596	Avg:A Wt:C2	621		RSD=4.1	
	103.3	104	102.4	103.2	101.3	102.8	99.1	91.9	96.1	95.9	Org:N Dep:R				
21 PFPeA	1.162404	1.117030	1.019116	1.051473	1.081656	1.052306	1.093582	1.119401	1.009725	1.026322	Avg:A Wt:C2	1.073301		RSD=4.7	
	108.3	104.1	95	98	100.8	98	101.9	104.3	94.1	95.6	Org:N Dep:R				
D 44 13C3_PFBS	188	193	186	190	194	193	186	185	181	191	Avg:A Wt:C2	189		RSD=2.2	
	99.7	102.5	98.5	100.7	102.6	102.1	98.5	97.9	96.1	101.4	Org:N Dep:R				
7 PFBS	1.578396	1.317806	1.237623	1.228698	1.297635	1.257719	1.303221	1.265183	1.275548	1.265599	Avg:A Wt:C2	1.302743		RSD=7.7	
	121.2	101.2	95	94.3	99.6	96.5	100	97.1	97.9	97.1	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	1.807447	2.638137	2.077719	1.923504	2.134919	2.020312	2.006705	2.359216	1.990817	2.250092	Avg:A Wt:C2	2.120887		RSD=11.3	
	85.2	124.4	98	90.7	100.7	95.3	94.6	111.2	93.9	106.1	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	21.3132	20.7060	21.8748	20.5616	21.1182	20.6842	21.1520	18.0190	21.9538	20.2386	Avg:A Wt:C2	20.7621		RSD=5.3	
	102.7	99.7	105.4	99	101.7	99.6	101.9	86.8	105.7	97.5	Org:N Dep:R				
D 49 13C5_PFHxA	686	648	629	703	649	676	680	650	627	659	Avg:A Wt:C2	661		RSD=3.8	
	103.8	98.1	95.2	106.3	98.3	102.4	102.9	98.4	94.9	99.7	Org:N Dep:R				
15 PFHxA	1.187075	1.047821	1.020141	0.947742	1.127037	0.955635	0.920017	0.993106	0.984186	0.947618	Avg:A Wt:C2	1.013038		RSD=8.5	
	117.2	103.4	100.7	93.6	111.3	94.3	90.8	98	97.2	93.5	Org:N Dep:R				
22 PFPeS	0.842555	0.802335	0.937696	0.864883	0.842459	0.827245	0.861519	0.872004	0.890581	0.871057	Avg:A Wt:C2	0.861233		RSD=4.3	
	97.8	93.2	108.9	100.4	97.8	96.1	100	101.3	103.4	101.1	Org:N Dep:R				
28 GenX	0.945681	0.743521	0.689800	0.664174	0.708970	0.713439	0.663983	0.689316	0.697698	0.675410	Ln:A Wt:C2	0.673128	23.6768	R^2=0.997	
	105.3	92.9	93.7	95.2	103.6	105.1	98.3	102.2	103.5	100.3	Org:N Dep:R			RSE=5	
D 66 13C3_GenX	247	246	235	238	244	236	240	220	229	226	Avg:A Wt:C2	236		RSD=3.8	
	104.6	104.3	99.6	100.7	103.4	99.9	101.6	93.2	97.1	95.6	Org:N Dep:R				
13 PFHpA	1.240877	1.166952	1.143162	1.111780	1.078455	1.065436	1.055609	1.146786	1.114864	1.043696	Avg:A Wt:C2	1.116762		RSD=5.4	
	111.1	104.5	102.4	99.6	96.6	95.4	94.5	102.7	99.8	93.5	Org:N Dep:R				
D 47 13C4_PFHpA	524	547	553	559	574	532	557	486	513	516	Avg:A Wt:C2	536		RSD=4.9	
	97.7	102	103.2	104.2	107	99.2	103.8	90.8	95.7	96.3	Org:N Dep:R				
D 45 13C3_PFHxS	135	151	151	146	147	144	140	132	141	139	Avg:A Wt:C2	142		RSD=4.5	
	94.6	106.1	105.9	102.3	103.1	100.9	98.5	92.5	98.8	97.4	Org:N Dep:R				
14 PFHxS	1.066690	1.181421	1.126948	1.045113	1.081209	1.090399	1.062555	1.124839	1.100705	1.105706	Avg:A Wt:C2	1.098558		RSD=3.6	
	97.1	107.5	102.6	95.1	98.4	99.3	96.7	102.4	100.2	100.7	Org:N Dep:R				
29 ADONA	7.518989	7.039757	6.552487	7.073507	7.586510	6.909073	7.392763	6.900277	6.365317	6.777996	Avg:A Wt:C2	7.011668		RSD=5.7	
	107.2	100.4	93.5	100.9	108.2	98.5	105.4	98.4	90.8	96.7	Org:N Dep:R				
2 6:2 FTS	2.998609	3.177386	2.505293	2.171849	2.345683	2.529857	2.296124	2.637983	2.277211	2.282192	Avg:A Wt:C2	2.522219		RSD=13.2	
	118.9	126	99.3	86.1	93	100.3	91	104.6	90.3	90.5	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	17.5046	19.0262	18.5346	19.1606	19.3816	17.9802	19.0454	15.3556	16.9358	17.6656	Avg:A Wt:C2	18.0590		RSD=6.9	
	96.9	105.4	102.6	106.1	107.3	99.6	105.5	85	93.8	97.8	Org:N Dep:R				
D 53 13C8_PFOA	601	582	581	622	564	567	563	529	512	506	Avg:A Wt:C2	563		RSD=6.7	
	106.9	103.5	103.3	110.6	100.2	100.8	100	93.9	90.9	89.9	Org:N Dep:R				
20 PFOA	1.125874	1.125166	0.929049	0.895486	1.018262	0.990294	0.988765	0.953596	0.945546	1.006436	Avg:A Wt:C2	0.997847		RSD=7.7	
	112.8	112.8	93.1	89.7	102	99.2	99.1	95.6	94.8	100.9	Org:N Dep:R				
12 PFHpS	1.346717	1.053252	1.018516	1.064064	1.016927	1.026210	1.064063	1.026115	0.940035	0.969221	Avg:A Wt:C2	1.052512		RSD=10.5	
	128	100.1	96.8	101.1	96.6	97.5	101.1	97.5	89.3	92.1	Org:N Dep:R				
D 54 13C8_PFOS	152	152	144	150	149	145	137	127	140	139	Avg:A Wt:C2	144		RSD=5.5	
	105.8	106.1	100.1	104.2	104	101.2	95.4	88.8	97.2	97.1	Org:N Dep:R				
D 56 13C9_PFNA	679	715	680	668	663	656	659	620	622	642	Avg:A Wt:C2	660		RSD=4.3	
	102.8	108.3	102.9	101.1	100.3	99.4	99.8	93.9	94.2	97.3	Org:N Dep:R				
17 PFNA	1.112627	1.063337	1.075724	1.037724	1.084006	1.104368	1.104857	1.064969	1.051807	0.998279	Avg:A Wt:C2	1.069770		RSD=3.3	
	104	99.4	100.6	97	101.3	103.2	103.3	99.6	98.3	93.3	Org:N Dep:R				
18 PFOS	1.252705	1.165365	1.126777	1.062569	1.062276	1.067198	1.190475	1.196046	1.127515	1.150029	Avg:A Wt:C2	1.140095		RSD=5.6	
	109.9	102.2	98.8	93.2	93.2	93.6	104.4	104.9	98.9	100.9	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.977556	3.502440	3.845390	3.410858	3.396166	3.528752	3.943055	4.239882	3.612344	3.775502	Avg:A Wt:C2	3.723194		RSD=7.5	
	106.8	94.1	103.3	91.6	91.2	94.8	105.9	113.9	97	101.4	Org:N Dep:R				
D 55 13C8_PFOSA	318	294	310	300	313	292	304	302	285	285	Avg:A Wt:C2	300		RSD=3.8	
	105.9	97.8	103.1	99.8	104.3	97.3	101.2	100.6	95	95	Org:N Dep:R				
19 PFOSA	1.014355	1.062533	0.978467	0.999276	1.055907	1.115413	1.017026	1.012920	1.072565	1.116999	Avg:A Wt:C2	1.044546		RSD=4.6	
	97.1	101.7	93.7	95.7	101.1	106.8	97.4	97	102.7	106.9	Org:N Dep:R				
16 PFNS	0.793588	0.971999	0.730939	0.894077	0.784396	0.833647	0.959841	0.847457	0.819008	0.817409	Avg:A Wt:C2	0.845236		RSD=9.0	
	93.9	115	86.5	105.8	92.8	98.6	113.6	100.3	96.9	96.7	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	21.6514	21.4574	20.8050	23.4084	22.1666	20.3804	22.2806	18.3890	19.9854	20.1546	Avg:A Wt:C2	21.0679		RSD=6.8	
	102.8	101.8	98.8	111.1	105.2	96.7	105.8	87.3	94.9	95.7	Org:N Dep:R				
10 PFDA	1.312548	1.174268	1.040218	1.116284	1.041629	1.019065	1.122576	1.144935	1.046091	1.053352	Avg:A Wt:C2	1.107097		RSD=8.1	
	118.6	106.1	94	100.8	94.1	92	101.4	103.4	94.5	95.1	Org:N Dep:R				
D 51 13C6_PFDA	634	665	670	635	663	668	644	569	583	606	Avg:A Wt:C2	634		RSD=5.8	
	100	105	105.7	100.2	104.6	105.4	101.7	89.8	92	95.5	Org:N Dep:R				
3 8:2 FTS	Disabled	2.147772	2.595179	2.226776	2.416743	2.251974	2.025063	2.220551	2.071763	2.028451	Avg:A Wt:C2	2.220475		RSD=8.5	
	Disabled	96.7	116.9	100.3	108.8	101.4	91.2	100	93.3	91.4	Org:N Dep:R				
D 58 d3-MeFOSAA	139	143	134	129	133	133	132	126	130	142	Avg:A Wt:C2	134		RSD=4.3	
	103.5	106.7	100.1	95.9	99	99.5	98.2	93.8	97.1	106.1	Org:N Dep:R				
6 N-MeFOSAA	0.707192	0.854259	0.915805	0.822346	0.813874	0.758649	0.842798	0.825585	0.775018	0.744141	Avg:A Wt:C2	0.805967		RSD=7.5	
	87.7	106	113.6	102	101	94.1	104.6	102.4	96.2	92.3	Org:N Dep:R				
9 PFDS	0.833442	0.854616	0.855904	0.801202	0.772285	0.778049	0.836763	0.909750	0.792896	0.797810	Avg:A Wt:C2	0.823272		RSD=5.2	
	101.2	103.8	104	97.3	93.8	94.5	101.6	110.5	96.3	96.9	Org:N Dep:R				
D 60 d5-EtFOSAA	124	129	129	118	127	127	123	110	108	112	Avg:A Wt:C2	121		RSD=6.7	
	102.9	106.9	107.1	97.9	104.9	105.1	101.8	91.5	89.4	92.4	Org:N Dep:R				
D 52 13C7_PFUdA	721	689	691	707	682	718	713	592	624	581	Avg:A Wt:C2	672		RSD=7.9	
	107.3	102.5	102.8	105.3	101.5	106.9	106.2	88.1	92.8	86.5	Org:N Dep:R				
25 PFUdA	0.841970	0.994078	0.842628	0.930254	0.921512	0.925977	0.829842	0.986382	0.845311	0.907831	Avg:A Wt:C2	0.902578		RSD=6.7	
	93.3	110.1	93.4	103.1	102.1	102.6	91.9	109.3	93.7	100.6	Org:N Dep:R				
5 N-EtFOSAA	1.249146	1.116395	1.096808	1.085210	0.937516	0.898596	0.992673	0.973960	1.000523	0.956066	Avg:A Wt:C2	1.030689		RSD=10.2	
	121.2	108.3	106.4	105.3	91	87.2	96.3	94.5	97.1	92.8	Org:N Dep:R				
D 61 d7-MeFOSE	110	105	109	102	104	105	106	97.5780	101	108	Avg:A Wt:C2	105		RSD=3.6	
	104.9	100.3	104.1	97	99.1	100.1	101.2	93.3	96.9	103.1	Org:N Dep:R				
D 57 d3-MeFOSA	57.9800	56.7780	54.7120	54.8460	48.1510	53.2970	58.2680	53.5350	54.9390	63.5570	Avg:A Wt:C2	55.6063		RSD=7.2	
	104.3	102.1	98.4	98.6	86.6	95.8	104.8	96.3	98.8	114.3	Org:N Dep:R				
32 MeFOSE	1.141383	1.038046	1.174349	1.188706	1.210876	1.170614	1.094582	1.162222	1.101485	1.041761	Avg:A Wt:C2	1.132402		RSD=5.3	
	100.8	91.7	103.7	105	106.9	103.4	96.7	102.6	97.3	92	Org:N Dep:R				
26 MeFOSA	1.388065	1.216492	0.952259	1.133975	1.217732	1.064047	1.020636	1.073666	1.092436	0.941408	Avg:A Wt:C2	1.110072		RSD=12.2	
	125	109.6	85.8	102.2	109.7	95.9	91.9	96.7	98.4	84.8	Org:N Dep:R				
31 11Cl-PF3OUDS	3.146560	3.187258	3.238127	3.252621	3.113031	3.166569	3.421501	3.372843	3.117384	3.231994	Avg:A Wt:C2	3.224789		RSD=3.2	
	97.6	98.8	100.4	100.9	96.5	98.2	106.1	104.6	96.7	100.2	Org:N Dep:R				
D 62 d9-EtFOSE	115	114	129	121	113	129	113	110	127	120	Avg:A Wt:C2	119		RSD=6.0	
	96.9	95.6	108.4	101.6	94.7	108.2	95.1	92.4	106.5	100.5	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	1.303467	0.964237	0.908890	0.913559	0.975549	0.870728	0.921310	0.994862	0.863766	0.968147	Ln:A Wt:C2	0.904816	16.3519	R^2=0.993	
	107.9	88.5	91.4	97.4	106	95.3	101.5	109.8	95.3	106.9	Org:N Dep:R			RSE=7.9	
D 59 d5-EtFOSA	53.1750	49.8490	49.2600	49.2070	50.6490	54.6270	51.7340	47.4730	54.7700	49.4010	Avg:A Wt:C2	51.0145		RSD=4.9	
	104.2	97.7	96.6	96.5	99.3	107.1	101.4	93.1	107.4	96.8	Org:N Dep:R				
27 EtFOSA	1.371697	1.252984	1.236500	1.104599	1.120812	1.026827	1.119078	1.153755	0.983787	1.146418	Avg:A Wt:C2	1.151646		RSD=9.8	
	119.1	108.8	107.4	95.9	97.3	89.2	97.2	100.2	85.4	99.5	Org:N Dep:R				
D 38 13C2_PFDoA	690	739	676	704	688	694	666	603	650	651	Avg:A Wt:C2	676		RSD=5.4	
	102	109.3	100	104.1	101.7	102.7	98.6	89.2	96.1	96.3	Org:N Dep:R				
11 PFDoA	1.139519	1.070602	1.070129	1.034651	1.028668	1.046564	1.097777	1.159288	0.988726	0.986097	Avg:A Wt:C2	1.062202		RSD=5.4	
	107.3	100.8	100.7	97.4	96.8	98.5	103.3	109.1	93.1	92.8	Org:N Dep:R				
4 10:2 FTS	3.220590	2.799139	3.451333	2.456295	3.067632	3.331067	2.562684	3.138862	2.741874	2.704128	Avg:A Wt:C2	2.947360		RSD=11.5	
	109.3	95	117.1	83.3	104.1	113	86.9	106.5	93	91.7	Org:N Dep:R				
34 PFDOS	0.724617	0.630478	0.728814	0.708113	0.662808	0.680264	0.782075	0.778515	0.733280	0.769866	Avg:A Wt:C2	0.719883		RSD=7.0	
	100.7	87.6	101.2	98.4	92.1	94.5	108.6	108.1	101.9	106.9	Org:N Dep:R				
24 PFTrDA	0.986339	0.882399	0.910150	0.870227	0.937886	0.866320	0.935963	0.942751	0.880563	0.851964	Avg:A Wt:C2	0.906456		RSD=4.8	
	108.8	97.3	100.4	96	103.5	95.6	103.3	104	97.1	94	Org:N Dep:R				
D 42 13C2_PFTeDA	953	963	913	954	948	937	940	924	934	967	Avg:A Wt:C2	943		RSD=1.8	
	101	102.1	96.7	101.2	100.5	99.3	99.6	97.9	99.1	102.5	Org:N Dep:R				
23 PFTeDA	0.883198	0.862391	0.871268	0.818614	0.822684	0.808525	0.838477	0.804818	0.804174	0.731460	Avg:A Wt:C2	0.824561		RSD=5.3	
	107.1	104.6	105.7	99.3	99.8	98.1	101.7	97.6	97.5	88.7	Org:N Dep:R				
35 PFHxDA	0.809254	0.784921	0.720830	0.729766	0.695040	0.691613	0.703106	0.675082	0.641913	0.640323	Avg:A Wt:C2	0.709185		RSD=7.8	
	114.1	110.7	101.6	102.9	98	97.5	99.1	95.2	90.5	90.3	Org:N Dep:R				
D 40 13C2_PFHxDA	928	952	944	923	931	910	907	887	919	932	Avg:A Wt:C2	923		RSD=2.0	
	100.6	103.1	102.3	100	100.8	98.6	98.2	96.1	99.5	100.9	Org:N Dep:R				
36 PFODA	0.917445	0.876698	0.882181	0.892738	0.877045	0.878893	0.918030	0.894690	0.840647	0.843705	Avg:A Wt:C2	0.882207		RSD=2.9	
	104	99.4	100	101.2	99.4	99.6	104.1	101.4	95.3	95.6	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	082021013.d	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13
2	082021014.d	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51
3	082021015.d	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26
4	082021016.d	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05
5	082021017.d	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39
6	082021018.d	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14
7	082021019.d	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48
8	082021020.d	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29
9	082021021.d	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07
10	082021022.d	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	711817	750237	682698	710112	779629	695301	722568	665972	664793	701785	0.35
* 39 13C2_PFHxA	635476	661097	654818	592976	708776	594798	647550	611274	601331	613844	0.86
* 41 13C2_PFOA	612554	620732	601914	590213	635131	573295	573964	544064	546360	532997	3.47
* 43 13C3_PFBA	585791	589980	580253	549732	601915	558882	569173	530685	545012	544810	1.81
* 48 13C4_PFOS	142432	145418	148433	147337	152674	141674	157483	140620	136839	146571	0.71

13C2_PFDA ((|701785 - 711817| / (701785 + 711817)) / 2) * 100 = 0.35
13C2_PFHxA ((|613844 - 635476| / (613844 + 635476)) / 2) * 100 = 0.87
13C2_PFOA ((|532997 - 612554| / (532997 + 612554)) / 2) * 100 = 3.47
13C3_PFBA ((|544810 - 585791| / (544810 + 585791)) / 2) * 100 = 1.81
13C4_PFOS ((|146571 - 142432| / (146571 + 142432)) / 2) * 100 = 0.72

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	082021013.d	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13
2	082021014.d	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51
3	082021015.d	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26
4	082021016.d	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05
5	082021017.d	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39
6	082021018.d	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14
7	082021019.d	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48
8	082021020.d	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29
9	082021021.d	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07
10	082021022.d	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	617106	631637	619939	605639	612112	610466	587119	564178	584822	578242	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	34827	65794	130152	313148	653288	1236213	3219153	6101356	8729100	11698456	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	641739	645981	636336	641171	629666	638720	615520	571146	597215	595547	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	37298	72158	129700	337087	681082	1344258	3365607	6393414	9045341	12224455	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	188203	193452	185991	190114	193652	192763	185921	184892	181449	191379	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	13130	22536	40697	103248	222140	428637	1070949	2067873	3068986	4282258	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	1799	5102	8490	18470	42110	78061	198222	397050	612321	850663	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	106566	103530	109374	102808	105591	103421	105760	90095	109769	101193	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	685601	647916	628678	702501	649325	676258	679627	650218	626964	658569	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	635476	661097	654818	592976	708776	594798	647550	611274	601331	613844	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	40693	67890	128268	332895	731813	1292511	3126342	6457352	9255741	12481442	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	7437	14559	32718	77116	153029	299151	751218	1512306	2273641	3127331	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	23373	36620	64902	157926	346222	673221	1593376	3035092	4800030	6102749	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1235776	1231303	1176101	1188890	1220862	1179535	1199862	1100763	1146635	1129452	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	32491	63806	126503	310488	618730	1133157	2937550	5578232	8577524	10770688	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	523678	546775	553303	558542	573719	531781	556560	486423	512919	515988	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	134688	150973	150728	145666	146711	143590	140160	131665	140562	138655	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	6537	16231	30915	69268	144349	284958	677621	1347727	2111891	2790272	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	47699	100117	186072	485304	1048469	1869067	4880359	8558305	12642418	17705889	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	2488	5731	8804	19725	43099	86244	207283	384014	548414	764397	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	87523	95131	92673	95803	96908	89901	95227	76778	84679	88328	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	612554	620732	601914	590213	635131	573295	573964	544064	546360	532997	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	601453	582163	581331	622484	563802	567014	562582	528654	511773	505909	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	33858	65503	108017	278713	574098	1123021	2781307	5041221	7258570	10183303	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	8634	15138	29230	73779	142033	280561	709902	1286185	1886863	2558734	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	151947	152285	143772	149542	149352	145329	136973	127494	139567	139425	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	142432	145418	148433	147337	152674	141674	157483	140620	136839	146571	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	679257	714938	679649	667765	662557	656460	659112	619854	622392	642472	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	37788	76022	146223	346478	718216	1449947	3641124	6601252	9819541	12827321	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	8832	16469	30067	73729	147230	287856	756612	1415095	2190505	2975961	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	28164	49710	103053	237691	472733	955915	2516829	5038015	7048212	9812083	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	318153	293685	309571	299679	313093	292074	303889	302094	285379	285337	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	16136	31205	60581	149731	330597	651566	1545315	3059971	4591315	6374421	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	5788	14210	20177	64177	112465	232614	631067	1037239	1646014	2188171	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	108257	107287	104025	117042	110833	101902	111403	91945	99927	100773	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	41594	78121	139399	354543	690717	1361950	3616950	6513843	9149023	12756096	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	711817	750237	682698	710112	779629	695301	722568	665972	664793	701785	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	633790	665274	670047	635220	663112	668235	644402	568927	583061	605500	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
3 8:2 FTS	Disabled	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	Disabled	4415	10345	24968	51321	87937	216123	391187	594990	783311	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	693730	715064	671076	642771	663389	667120	658383	628356	650892	711283	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	4906	12217	24583	52858	107983	202444	554884	1037523	1513360	2117179	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	6104	12546	23725	57750	111190	218005	552439	1118121	1600175	2144604	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	620904	644888	646125	590881	633381	634337	614587	552410	539669	557940	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	720833	688618	690922	707166	681974	718387	713170	591970	623669	581276	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	30346	68454	116438	328922	628447	1330419	2959092	5839085	7907917	10554003	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7756	14399	28347	64123	118761	228005	610084	1076050	1619854	2133709	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	109709	104899	108954	101502	103682	104751	105919	97578	101335	107812	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	57980	56778	54712	54846	48151	53297	58268	53535	54939	63557	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	6261	10889	25590	60328	125546	245246	579685	1134073	1674285	2246287	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	4024	6907	10420	31097	58635	113421	297352	574787	900260	1196662	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	22519	45722	87710	229096	437971	867006	2207357	4050762	6147735	8489696	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	115492	113945	129207	121008	112837	128976	113367	110085	126899	119758	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	7527	10987	23487	55274	110078	224606	522231	1095194	1644166	2318868	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	53175	49849	49260	49207	50649	54627	51734	47473	54770	49401	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3647	6246	12182	27177	56768	112185	289472	547722	808230	1132684	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	689905	739042	675993	703607	687538	694489	666493	602897	650076	651030	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	39308	79122	144680	363994	707248	1453655	3658303	6989310	9641203	12839569	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3361	5790	13844	27714	65551	130889	275213	556426	792371	1050772	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	5329	9294	20286	51252	95824	191397	518476	960798	1486002	2078076	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	34024	65213	123051	306149	644832	1203300	3119064	5683818	8586495	11093078	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	953240	963287	912555	954477	948336	937013	939910	923612	934427	966619	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	42095	83073	159016	390674	780181	1515197	3940465	7433394	11271630	14140854	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	37564	74715	136133	336777	647029	1258523	3186899	5987157	8844370	11931134	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	928361	951879	944279	922972	930923	909846	906520	886879	918543	931649	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	42586	83451	166605	411986	816461	1599314	4161065	7934814	11582563	15720730	

Report Date: 21-Aug-2021 12:36:25 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	082021013.d	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13
2	082021014.d	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51
3	082021015.d	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26
4	082021016.d	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05
5	082021017.d	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39
6	082021018.d	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14
7	082021019.d	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48
8	082021020.d	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29
9	082021021.d	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07
10	082021022.d	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.712	1.711	1.711	1.710	1.711	1.709	1.710	1.712	1.711	1.711	1.710	0.056
8 PFBA	1.712	1.711	1.711	1.710	1.711	1.715	1.717	1.712	1.711	1.711	1.712	0.120
D 50 13C5_PFPeA	2.077	2.077	2.077	2.076	2.077	2.083	2.087	2.077	2.088	2.088	2.080	0.230
21 PFPeA	2.077	2.077	2.077	2.076	2.088	2.083	2.087	2.088	2.088	2.088	2.082	0.247
D 44 13C3_PFBS	2.130	2.130	2.130	2.140	2.141	2.136	2.140	2.141	2.141	2.141	2.136	0.223
7 PFBS	2.141	2.130	2.130	2.140	2.141	2.136	2.140	2.141	2.141	2.141	2.137	0.203
1 4:2 FTS	2.407	2.406	2.407	2.406	2.407	2.405	2.406	2.407	2.407	2.407	2.406	0.020
D 63 13C2_4:2 FTS_2	2.407	2.406	2.407	2.406	2.407	2.405	2.406	2.407	2.407	2.407	2.406	0.020
D 49 13C5_PFHxA	2.442	2.442	2.442	2.441	2.442	2.441	2.441	2.442	2.442	2.442	2.442	0.021
* 39 13C2_PFHxA	2.442	2.442	2.442	2.441	2.442	2.441	2.450	2.442	2.442	2.451	2.443	0.155
15 PFHxA	2.442	2.442	2.442	2.441	2.442	2.441	2.450	2.442	2.451	2.451	2.444	0.181
22 PFPeS	2.478	2.477	2.478	2.477	2.478	2.477	2.477	2.478	2.478	2.478	2.477	0.030
28 GenX	2.558	2.558	2.558	2.557	2.558	2.566	2.557	2.558	2.567	2.567	2.560	0.168
D 66 13C3_GenX	2.558	2.558	2.558	2.557	2.558	2.557	2.557	2.558	2.558	2.558	2.558	0.028
13 PFHpA	2.813	2.818	2.818	2.817	2.818	2.817	2.817	2.818	2.818	2.818	2.817	0.063
D 47 13C4_PFHpA	2.813	2.818	2.818	2.817	2.818	2.817	2.817	2.818	2.818	2.818	2.817	0.063
D 45 13C3_PFHxS	2.831	2.827	2.827	2.835	2.836	2.835	2.835	2.827	2.836	2.836	2.832	0.149
14 PFHxS	2.831	2.827	2.836	2.826	2.836	2.835	2.835	2.836	2.836	2.836	2.833	0.147
29 ADONA	2.858	2.854	2.854	2.853	2.864	2.853	2.862	2.864	2.863	2.864	2.859	0.167
2 6:2 FTS	3.169	3.172	3.181	3.178	3.174	3.178	3.178	3.181	3.181	3.181	3.177	0.127
D 64 13C2_6:2 FTS_2	3.169	3.179	3.174	3.178	3.181	3.178	3.178	3.181	3.181	3.174	3.177	0.111
* 41 13C2_PFOA	3.196	3.199	3.201	3.205	3.201	3.205	3.205	3.208	3.207	3.208	3.203	0.124
D 53 13C8_PFOA	3.196	3.199	3.201	3.205	3.201	3.205	3.205	3.201	3.207	3.208	3.202	0.117
20 PFOA	3.203	3.205	3.201	3.205	3.201	3.205	3.205	3.208	3.207	3.208	3.204	0.083
12 PFHpS	3.196	3.205	3.207	3.212	3.208	3.205	3.211	3.208	3.214	3.214	3.208	0.168
D 54 13C8_PFOS	3.571	3.575	3.577	3.582	3.577	3.574	3.582	3.577	3.585	3.585	3.578	0.140
* 48 13C4_PFOS	3.579	3.575	3.577	3.582	3.577	3.582	3.582	3.585	3.585	3.585	3.580	0.109
D 56 13C9_PFNA	3.579	3.583	3.585	3.582	3.585	3.582	3.590	3.585	3.593	3.585	3.584	0.115
17 PFNA	3.579	3.583	3.585	3.582	3.585	3.590	3.590	3.585	3.593	3.593	3.586	0.137
18 PFOS	3.571	3.575	3.577	3.582	3.585	3.582	3.582	3.585	3.585	3.585	3.580	0.142
30 9Cl-PF3ONS	3.784	3.787	3.789	3.787	3.790	3.787	3.795	3.790	3.797	3.799	3.790	0.125
D 55 13C8_PFOSA	3.864	3.868	3.861	3.868	3.863	3.868	3.868	3.871	3.870	3.871	3.867	0.086
19 PFOSA	3.856	3.868	3.861	3.868	3.863	3.868	3.868	3.871	3.870	3.871	3.866	0.121

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.922	3.917	3.927	3.925	3.920	3.925	3.934	3.928	3.927	3.929	3.925	0.119
D 65 13C2_8:2 FTS_2	3.930	3.926	3.927	3.934	3.928	3.934	3.934	3.928	3.936	3.937	3.931	0.098
10 PFDA	3.930	3.934	3.936	3.934	3.937	3.942	3.942	3.937	3.944	3.946	3.938	0.128
* 37 13C2_PFDA	3.930	3.934	3.936	3.934	3.937	3.942	3.942	3.937	3.944	3.946	3.938	0.128
D 51 13C6_PFDA	3.930	3.934	3.936	3.934	3.937	3.934	3.942	3.937	3.944	3.946	3.937	0.129
3 8:2 FTS	Disabled	3.926	3.927	3.934	3.937	3.934	3.934	3.928	3.936	3.937	3.932	0.107
D 58 d3-MeFOSAA	4.091	4.093	4.097	4.102	4.098	4.093	4.102	4.098	4.097	4.098	4.096	0.088
6 N-MeFOSAA	4.091	4.085	4.097	4.102	4.107	4.102	4.102	4.107	4.106	4.107	4.100	0.185
9 PFDS	4.239	4.232	4.225	4.231	4.237	4.231	4.241	4.237	4.236	4.237	4.234	0.109
D 60 d5-EtFOSAA	4.249	4.252	4.256	4.252	4.257	4.251	4.262	4.257	4.256	4.258	4.254	0.091
D 52 13C7_PFUdA	4.249	4.252	4.256	4.252	4.257	4.251	4.251	4.257	4.256	4.258	4.253	0.074
25 PFUdA	4.249	4.252	4.246	4.252	4.257	4.251	4.251	4.257	4.256	4.258	4.252	0.094
5 N-EtFOSAA	4.259	4.252	4.256	4.262	4.267	4.262	4.262	4.267	4.266	4.268	4.261	0.130
D 61 d7-MeFOSE	4.289	4.292	4.286	4.292	4.287	4.292	4.292	4.297	4.296	4.298	4.292	0.095
D 57 d3-MeFOSA	4.309	4.313	4.306	4.312	4.308	4.312	4.312	4.318	4.317	4.308	4.311	0.084
32 MeFOSE	4.299	4.303	4.296	4.302	4.308	4.302	4.302	4.297	4.307	4.308	4.302	0.095
26 MeFOSA	4.309	4.313	4.317	4.322	4.318	4.312	4.322	4.318	4.317	4.318	4.316	0.097
31 11Cl-PF3OUDS	4.392	4.393	4.389	4.393	4.398	4.393	4.393	4.398	4.397	4.398	4.394	0.064
D 62 d9-EtFOSE	4.458	4.459	4.453	4.459	4.454	4.459	4.459	4.454	4.462	4.455	4.457	0.066
33 EtFOSE	4.467	4.468	4.471	4.468	4.472	4.468	4.468	4.472	4.471	4.473	4.469	0.056
D 59 d5-EtFOSA	4.476	4.477	4.480	4.477	4.481	4.477	4.477	4.481	4.480	4.482	4.478	0.056
27 EtFOSA	4.485	4.486	4.489	4.486	4.481	4.486	4.486	4.490	4.489	4.491	4.486	0.067
D 38 13C2_PFDoA	4.521	4.522	4.525	4.531	4.526	4.531	4.531	4.535	4.534	4.527	4.528	0.111
11 PFDoA	4.521	4.522	4.525	4.531	4.526	4.531	4.531	4.526	4.534	4.536	4.528	0.111
4 10:2 FTS	4.539	4.539	4.543	4.540	4.535	4.540	4.540	4.544	4.543	4.545	4.540	0.063
34 PFDOS	4.745	4.739	4.741	4.745	4.742	4.745	4.745	4.748	4.747	4.749	4.744	0.071
24 PFTrDA	4.772	4.766	4.768	4.772	4.769	4.772	4.772	4.775	4.774	4.776	4.771	0.071
D 42 13C2_PFTeDA	4.990	4.990	4.991	4.990	4.992	4.996	4.996	4.998	4.997	4.998	4.993	0.070
23 PFTeDA	4.990	4.990	4.991	4.990	4.998	4.996	4.996	4.998	4.997	4.998	4.994	0.075
35 PFHxDA	5.385	5.385	5.395	5.394	5.390	5.394	5.394	5.399	5.395	5.399	5.393	0.086
D 40 13C2_PFHxDA	5.385	5.385	5.387	5.394	5.390	5.394	5.394	5.399	5.395	5.399	5.392	0.092
36 PFODA	5.765	5.772	5.774	5.772	5.775	5.772	5.779	5.775	5.780	5.782	5.774	0.090

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021013.d
Injection Date: 20-Aug-2021 17:50:13 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 1 Auto Sampler: 1
Sample Info: F.L. ICAL 50_SVLC-1596 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.711	4	617106	20	>100:1			1000.00	1026.58	100.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.711	4/0	34827	19	31:1			50.000	53.653		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	3	641739	16	>100:1			1000.00	1032.89	101.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.088	3/0	37298	15	40:1			50.000	54.151		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.141	4	188203	14	>100:1			1000.00	996.94	97.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	4/0	13130	21	>100:1	Target = 3.41		44.200	53.552		
298.9 > 99	44	2.130	2.141		3573	18	27:1	3.67 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	5/1	7437	16	>100:1	Target = 2.92		46.900	45.883		
349 > 99	44	2.469	2.478		2524	12	39:1	2.94 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	5	106566	16	>100:1			5000.00	5132.71	100.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	5/0	1799	21	30:1	Target = 1.58		46.700	39.798		
327 > 81	63	2.416	2.407		2776	16	13:1	0.64 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	5	685601	17	>100:1			1000.00	1037.90	105.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	5/0	40693	17	62:1	Target = 18.69		50.000	58.590		
313 > 119	49	2.442	2.442		1939	15	17:1	20.98 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	5	1235776	17	>100:1			5000.00	5232.27	101.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	5/0	23373	18	53:1	Target = 0.78		100.00	105.32		
285 > 185	66	2.558	2.558		28663	18	66:1	0.81 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.813	2.818	5	523678	17	>100:1			1000.00	977.07	91.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.813	2.818	5/0	32491	20	55:1	Target = 3.75		50.000	55.557		
363 > 169	47	2.813	2.818		8302	29	90:1	3.91 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.831	2.836	6	134688	17	>100:1			1000.00	946.24	91.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.831	2.836	6/0	6537	17	47:1	Target = 2.79		45.500	44.180		
399 > 99	45	2.840	2.836		3006	30	18:1	2.17 (1.39-4.19)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.858	2.864	6/0	47699	19	>100:1	Target = 3.21		47.100	50.508		
377 > 85	45	2.858	2.864		14009	16	91:1	3.40 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.196	3.208	6/0	8634	20	>100:1	Target = 3.03		47.600	60.905		
449 > 99	45	3.203	3.208		2096	22	17:1	4.11 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.169	3.181	6	87523	20	>100:1			5000.00	4846.50	90.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.169	3.174	6/0	2488	22	34:1	Target = 1.94		47.400	56.353		
427 > 81	64	3.169	3.174		1043	16	15:1	2.38 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.196	3.201	6	601453	22	>100:1			1000.00	1068.84	106.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.203	3.201	7/1	33858	18	34:1	Target = 2.91		50.000	56.415		
413 > 169	53	3.203	3.201		10981	17	75:1	3.08 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.571	3.577	7	151947	18				1000.00	1058.36	101.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.571	3.585	0/-7	8832	31	26:1	Target = 3.38	0.29	46.400	50.983		M
499 > 99	54	3.587	3.585		2711	28	22:1	3.25 (1.69-5.07)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.784	3.790	7/0	28164	20	>100:1			46.600	49.784		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.922	3.920	7/0	5788	19	63:1	Target = 2.80		48.000	45.067		
549 > 99	54	3.930	3.920		2204	22	5.6:1	2.62 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.239	4.237	7/0	6104	21	34:1	Target = 3.15		48.200	48.795		
599 > 99	54	4.228	4.237		1369	18	15:1	4.45 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.392	4.398	7/0	22519	23	>100:1			47.100	45.957		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.745	4.742	4/-3	5329	14	>100:1	Target = 3.01		48.400	48.718		
699 > 99	54	4.745	4.742		2083	23	25:1	2.55 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.579	3.585	7	679257	19	>100:1			1000.00	1028.48	102.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.579	3.585	7/0	37788	16	63:1	Target = 6.48		50.000	52.003		
463 > 169	56	3.587	3.585		6483	16	27:1	5.82 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.864	3.863	6	318153	18	>100:1			1000.00	1059.47	101.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.863	6/0	16136	15	>100:1	Target = 32.22		50.000	48.555		
498>478	55	3.848	3.863		352	5	7.6:1	45.84 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.930	3.928	7	108257	18	>100:1			5000.00	5138.49	97.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.939	3.937	1/-6	1312	9		Target = 1.96		47.900	27.290		M
527 > 81	65	3.905	3.937		878	18	11:1	1.49 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.539	4.535	7/0	3361	15	50:1	Target = 3.34		48.200	52.668		
627 > 80	65	4.521	4.535		861	14	11:1	3.90 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.930	3.937	7	633790	18	>100:1			1000.00	1000.05	95.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.930	3.937	7/0	41594	18	53:1	Target = 13.93		50.000	59.279		
513 > 169	51	3.922	3.937		2684	14	13:1	15.49 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.091	4.098	7	693730	18	>100:1			5000.00	5175.50	104.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.091	4.107	0/-7	4906	29	45:1	Target = 1.31	0.22	50.000	43.872		M
570 > 483	58	4.091	4.107		3427	26	25:1	1.43 (0.65-1.97)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.249	4.257	6	720833	16				1000.00	1072.99	105.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.249	4.257	6/0	30346	16	68:1	Target = 14.01		50.000	46.643		
563 > 169	52	4.239	4.257		2047	20	15:1	14.82 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.249	4.257	6	620904	17	>100:1			5000.00	5144.09	98	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.259	4.267	0/-6	7756	26		Target = 1.75		50.000	60.598		M
584 > 526	60	4.249	4.267		3644	24	13:1	2.12 (0.87-2.62)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.289	4.287	6	109709	14	>100:1			1000.00	1048.70	105.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.299	4.308	6/0	6261	12	29:1			50.000	50.397		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.309	4.308	6	57980	14	>100:1			1000.00	1042.69	120.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.309	4.318	6/0	4024	18	20:1	Target = 1.04		50.000	62.521		
512 > 219	57	4.320	4.318		3001	16	22:1	1.34 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.458	4.454	6	115492	17	>100:1			1000.00	969.24	102.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.467	4.472	6/0	7527	13	41:1			50.000	53.957		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.476	4.481	6	53175	14	>100:1			1000.00	1042.35	105	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.485	4.481	6/0	3647	12	35:1	Target = 1.05		50.000	59.554		
526 > 219	59	4.485	4.481		2399	19	13:1	1.52 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.521	4.526	6	689905	18	>100:1			1000.00	1020.41	100.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.521	4.526	6/0	39308	17	25:1	Target = 10.52		50.000	53.639		
613 > 169	38	4.521	4.526		3365	14	43:1	11.68 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.772	4.769	6/0	34024	19	72:1	Target = 7.51		50.000	54.406		
663 > 169	38	4.772	4.769		5087	28	71:1	6.68 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.990	4.992	5	953240	19	>100:1			1000.00	1010.49	100.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.990	4.998	5/0	42095	18	21:1	Target = 11.12		50.000	53.556		
713 > 169	42	4.984	4.998		3844	18	44:1	10.95 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.385	5.390	4	928361	18	>100:1			1000.00	1005.61	99.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.385	5.390	4/0	37564	17	>100:1	Target = 10.69		50.000	57.055		
813 > 269	40	5.385	5.390		3528	17	43:1	10.64 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.765	5.775	5/1	42586	22	>100:1	Target = 13.29		50.000	51.997		
913 > 319	40	5.765	5.775		3594	21	44:1	11.84 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.930	3.937	7	711817	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	5	635476	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.196	3.201	6	612554	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	4	585791	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.579	3.577	7	142432	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021014.d
Injection Date: 20-Aug-2021 18:00:51 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 2 Auto Sampler: 2
Sample Info: F.L. ICAL 100_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	631637	21	>100:1			1000.00	1050.76	103.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	65794	18	62:1			100.00	99.028		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	0	645981	15	>100:1			1000.00	1039.72	102.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.088	0/0	72158	14	84:1			100.00	104.07		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.141	0	193452	14	>100:1			1000.00	1024.74	99.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.141	0/0	22536	14	>100:1	Target = 3.41		88.400	89.422		
298.9 > 99	44	2.130	2.141		7273	19	57:1	3.09 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.478	0/0	14559	23	>100:1	Target = 2.92		93.800	87.385		
349 > 99	44	2.468	2.478		4967	21	28:1	2.93 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.407	0	103530	17	>100:1			5000.00	4986.48	98	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.407	0/0	5102	13	72:1	Target = 1.58		93.400	116.18		
327 > 81	63	2.397	2.407		3639	16	13:1	1.40 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	0	647916	17	>100:1			1000.00	980.85	99.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	0/0	67890	17	>100:1	Target = 18.69		100.00	103.43		
313 > 119	49	2.442	2.442		4372	20	44:1	15.52 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1231303	18	>100:1			5000.00	5213.33	100.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	0/0	36620	16	>100:1	Target = 0.78		200.00	185.74		
285 > 185	66	2.558	2.558		50083	18	>100:1	0.73 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	546775	16	>100:1			1000.00	1020.16	95.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	63806	18	62:1	Target = 3.75		100.00	104.49		
363 > 169	47	2.818	2.818		16318	14	91:1	3.91 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	150973	17	>100:1			1000.00	1060.65	102.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.836	0/0	16231	25	>100:1	Target = 2.79	0.15	91.000	97.864		
399 > 99	45	2.827	2.836		6069	30	66:1	2.67 (1.39-4.19)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.854	2.864	0/0	100117	18	>100:1	Target = 3.21		94.200	94.577		
377 > 85	45	2.854	2.864		29384	20	>100:1	3.40 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.205	3.208	1/1	15138	27	>100:1	Target = 3.03		95.200	95.267		
449 > 99	45	3.205	3.208		5691	24	30:1	2.65 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.179	3.181	1	95131	22	>100:1			5000.00	5267.78	98.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.172	3.174	1/0	5731	18	84:1	Target = 1.94		94.800	119.43		
427 > 81	64	3.179	3.174		2554	18	43:1	2.24 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.199	3.201	1	582163	22	>100:1			1000.00	1034.56	103.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.201	1/0	65503	20	68:1	Target = 2.91		100.00	112.76		
413 > 169	53	3.199	3.201		18382	19	66:1	3.56 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.575	3.577	1	152285	18	>100:1			1000.00	1060.71	102	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.575	3.585	0/-1	16469	33	98:1	Target = 3.38		92.800	94.857		M
499 > 99	54	3.575	3.585		4617	31	27:1	3.56 (1.69-5.07)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.790	1/0	49710	22	>100:1			93.200	87.674		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.917	3.920	0/-1	14210	23	79:1	Target = 2.80		96.000	110.40		
549 > 99	54	3.926	3.920		3885	22	44:1	3.65 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.232	4.237	0/-1	12546	20	91:1	Target = 3.15		96.400	100.07		
599 > 99	54	4.221	4.237		2795	18	27:1	4.48 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.393	4.398	1/0	45722	16	>100:1			94.200	93.104		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.739	4.742	0/-1	9294	15	>100:1	Target = 3.01		96.800	84.778		
699 > 99	54	4.739	4.742		3116	28	68:1	2.98 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.583	3.585	1	714938	20	>100:1			1000.00	1082.51	107.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.583	3.585	1/0	76022	17	>100:1	Target = 6.48		100.00	99.399		
463 > 169	56	3.591	3.585		10640	22	75:1	7.14 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.863	1	293685	25	>100:1			1000.00	977.99	93.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.868	3.863	1/0	31205	18	>100:1	Target = 32.22		100.00	101.72		
498>478	55	3.876	3.863		1162	18	14:1	26.85 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.926	3.928	0	107287	16	>100:1			5000.00	5092.44	96.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.926	3.937	7/7	4415	14	22:1	Target = 1.96		95.800	92.663		
527 > 81	65	3.934	3.937		3279	16	23:1	1.34 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.539	4.535	1/1	5790	12	68:1	Target = 3.34		96.400	91.552		
627 > 80	65	4.531	4.535		1378	18	8.6:1	4.20 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.937	1	665274	18	>100:1			1000.00	1049.73	100.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.934	3.937	1/0	78121	16	90:1	Target = 13.93		100.00	106.07		
513 > 169	51	3.934	3.937		4794	13	25:1	16.29 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.098	1	715064	17	>100:1			5000.00	5334.66	107.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.085	4.107	-1/-2	12217	29		Target = 1.31	0.14	100.00	105.99		M
570 > 483	58	4.093	4.107		12002	33	71:1	1.01 (0.65-1.97)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.252	4.257	1	688618	16	>100:1			1000.00	1025.04	101	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.252	4.257	1/0	68454	13	>100:1	Target = 14.01		100.00	110.14		
563 > 169	52	4.242	4.257		4339	20	36:1	15.77 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.252	4.257	1	644888	16	>100:1			5000.00	5342.79	101.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.252	4.267	0/-1	14399	37		Target = 1.75	0.08	100.00	108.32		
584 > 526	60	4.262	4.267		6863	35	42:1	2.09 (0.87-2.62)	0.09				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.287	1	104899	16	>100:1			1000.00	1002.72	101.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.303	4.308	1/0	10889	15	54:1			100.00	91.668		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.313	4.308	1	56778	17	>100:1			1000.00	1021.07	117.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.313	4.318	1/0	6907	14	34:1	Target = 1.04		100.00	109.59		
512 > 219	57	4.313	4.318		5897	17	38:1	1.17 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.454	1	113945	14	>100:1			1000.00	956.26	101	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.468	4.472	1/0	10987	13	83:1			100.00	88.495		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.481	1	49849	15	>100:1			1000.00	977.15	98.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.486	4.481	1/0	6246	15	21:1	Target = 1.05		100.00	108.80		
526 > 219	59	4.486	4.481		6806	19	38:1	0.91 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.522	4.526	1	739042	17	>100:1			1000.00	1093.08	107.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.522	4.526	1/0	79122	16	33:1	Target = 10.52		100.00	100.79		
613 > 169	38	4.522	4.526		8678	12	52:1	9.11 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.766	4.769	0/-1	65213	17	>100:1	Target = 7.51		100.00	97.346		
663 > 169	38	4.766	4.769		9014	19	>100:1	7.23 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.990	4.992	1	963287	20	>100:1			1000.00	1021.14	101.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.990	4.998	1/0	83073	19	15:1	Target = 11.12		100.00	104.59		
713 > 169	42	4.990	4.998		7257	22	78:1	11.44 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.385	5.390	1	951879	17	>100:1			1000.00	1031.08	102.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.385	5.390	1/0	74715	17	16:1	Target = 10.69		100.00	110.68		
813 > 269	40	5.385	5.390		7454	15	70:1	10.02 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.772	5.775	1/0	83451	21	>100:1	Target = 13.29		100.00	99.375		
913 > 319	40	5.765	5.775		5763	16	>100:1	14.48 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.934	3.937	1	750237	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	661097	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.199	3.201	1	620732	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	589980	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.575	3.577	0	145418	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021015.d
Injection Date: 20-Aug-2021 18:11:26 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 3 Auto Sampler: 3
Sample Info: F.L. ICAL 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	1	619939	21	>100:1			1000.00	1031.30	101.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	1/0	130152	20	>100:1			200.00	199.59		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	636336	16	>100:1			1000.00	1024.19	101.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.088	1/0	129700	13	>100:1			200.00	189.90		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.141	1	185991	14	>100:1			1000.00	985.22	96	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.141	0/-1	40697	16	>100:1	Target = 3.41		176.80	167.96		
298.9 > 99	44	2.130	2.141		12689	13	>100:1	3.20 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	32718	18	>100:1	Target = 2.92		187.60	204.26		
349 > 99	44	2.478	2.478		9822	14	>100:1	3.33 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	109374	17	>100:1			5000.00	5267.95	103.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	8490	17		Target = 1.58		186.80	183.00		
327 > 81	63	2.407	2.407		5842	18	34:1	1.45 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	628678	16	>100:1			1000.00	951.73	96.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	1/0	128268	17	>100:1	Target = 18.69		200.00	201.40		
313 > 119	49	2.442	2.442		6703	20	45:1	19.13 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	1	1176101	17	>100:1			5000.00	4979.61	96.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	1/0	64902	19	>100:1	Target = 0.78		400.00	374.73		
285 > 185	66	2.558	2.558		85039	17	>100:1	0.76 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	553303	18	>100:1			1000.00	1032.34	96.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	126503	18	>100:1	Target = 3.75		200.00	204.73		
363 > 169	47	2.818	2.818		30859	17	>100:1	4.09 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	150728	18	>100:1			1000.00	1058.93	102.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/1	30915	30	>100:1	Target = 2.79	0.20	182.00	186.70		
399 > 99	45	2.836	2.836		12999	27	56:1	2.37 (1.39-4.19)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.854	2.864	0/0	186072	17	>100:1	Target = 3.21		188.40	176.06		
377 > 85	45	2.854	2.864		59331	24	>100:1	3.13 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.207	3.208	1/1	29230	18	>100:1	Target = 3.03		190.40	184.25		
449 > 99	45	3.201	3.208		10368	18	59:1	2.81 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.174	3.181	1	92673	19	>100:1			5000.00	5131.67	95.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.174	1/0	8804	23	>100:1	Target = 1.94		189.60	188.33		
427 > 81	64	3.167	3.174		4732	26	28:1	1.86 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.201	3.201	1	581331	22	>100:1			1000.00	1033.08	103.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.201	3.201	0/-1	108017	19	82:1	Target = 2.91		200.00	186.21		
413 > 169	53	3.201	3.201		40167	19	>100:1	2.68 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.577	3.577	1	143772	18	>100:1			1000.00	1001.42	96.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.577	3.585	0/-1	30067	36	>100:1	Target = 3.38	0.15	185.60	183.43		M
499 > 99	54	3.577	3.585		9435	31	70:1	3.18 (1.69-5.07)	0.12				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.789	3.790	1/0	103053	20	>100:1			186.40	192.52		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.927	3.920	1/0	20177	16	>100:1	Target = 2.80		192.00	166.04		
549 > 99	54	3.927	3.920		9115	22	82:1	2.21 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.225	4.237	0/-1	23725	15	>100:1	Target = 3.15		192.80	200.44		
599 > 99	54	4.236	4.237		8013	21	76:1	2.96 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.389	4.398	0/-1	87710	18	>100:1			188.40	189.18		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.741	4.742	0/-1	20286	19	>100:1	Target = 3.01		193.60	196.00		
699 > 99	54	4.741	4.742		6185	18	36:1	3.27 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.585	1	679649	18	>100:1			1000.00	1029.08	102.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.585	3.585	1/0	146223	17	>100:1	Target = 6.48		200.00	201.11		
463 > 169	56	3.585	3.585		22552	16	>100:1	6.48 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.861	3.863	0	309571	16				1000.00	1030.89	98.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.861	3.863	0/0	60581	19	>100:1	Target = 32.22		200.00	187.35		
498>478	55	3.870	3.863		2321	20	28:1	26.10 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.927	3.928	0	104025	17	>100:1			5000.00	4937.61	93.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.927	3.937	1/1	10345	18	61:1	Target = 1.96		191.60	223.93		
527 > 81	65	3.944	3.937		3890	23	12:1	2.65 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.543	4.535	1/1	13844	18	>100:1	Target = 3.34		192.80	225.77		
627 > 80	65	4.525	4.535		4603	20	20:1	3.00 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.936	3.937	1	670047	18	>100:1			1000.00	1057.26	101	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.936	3.937	1/0	139399	18	>100:1	Target = 13.93		200.00	187.92		
513 > 169	51	3.936	3.937		10942	17	48:1	12.73 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.097	4.098	1	671076	18	>100:1			5000.00	5006.49	101.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.097	4.107	0/-1	24583	29	>100:1	Target = 1.31	0.12	200.00	227.26		M
570 > 483	58	4.097	4.107		15833	26	43:1	1.55 (0.65-1.97)	0.22				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.256	4.257	1	690922	15	>100:1			1000.00	1028.47	101.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.246	4.257	0/-1	116438	21	>100:1	Target = 14.01		200.00	186.72		
563 > 169	52	4.256	4.257		9623	19	59:1	12.09 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.256	4.257	1	646125	17	>100:1			5000.00	5353.04	102	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.256	4.267	0/-1	28347	28		Target = 1.75		200.00	212.83		M
584 > 526	60	4.256	4.267		14301	31	54:1	1.98 (0.87-2.62)	0.09				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.286	4.287	0	108954	16	>100:1			1000.00	1041.48	105.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.296	4.308	0/0	25590	19				200.00	207.41		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.306	4.308	0	54712	22	>100:1			1000.00	983.92	113.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.317	4.318	1/1	10420	18	42:1	Target = 1.04		200.00	171.57		
512 > 219	57	4.317	4.318		11962	12	51:1	0.87 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.453	4.454	0	129207	17	>100:1			1000.00	1084.34	114.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.471	4.472	1/1	23487	16	>100:1			200.00	182.83		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.480	4.481	1	49260	19	>100:1			1000.00	965.61	97.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.489	4.481	1/0	12182	19	67:1	Target = 1.05		200.00	214.74		
526 > 219	59	4.480	4.481		11414	14	73:1	1.06 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.525	4.526	1	675993	18	>100:1			1000.00	999.83	98.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.525	4.526	1/0	144680	14	66:1	Target = 10.52		200.00	201.49		
613 > 169	38	4.525	4.526		14038	13	>100:1	10.30 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.768	4.769	0/-1	123051	21	>100:1	Target = 7.51		200.00	200.81		
663 > 169	38	4.768	4.769		18064	21	99:1	6.81 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.991	4.992	1	912555	21	>100:1			1000.00	967.36	96.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.991	4.998	1/0	159016	20	23:1	Target = 11.12		200.00	211.33		
713 > 169	42	4.991	4.998		13824	20	>100:1	11.50 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.387	5.390	1	944279	19	>100:1			1000.00	1022.85	101.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.395	5.390	1/0	136133	18	30:1	Target = 10.69		200.00	203.28		
813 > 269	40	5.395	5.390		12584	18	>100:1	10.81 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.774	5.775	1/0	166605	23	15:1	Target = 13.29		200.00	199.99		
913 > 319	40	5.767	5.775		12341	23	>100:1	13.50 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.936	3.937	1	682698	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	1	654818	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.201	3.201	1	601914	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	580253	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.577	3.577	1	148433	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021016.d
Injection Date: 20-Aug-2021 18:22:05 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 4 Auto Sampler: 4
Sample Info: F.L. ICAL 500_SVLC-1599 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.710	1.711	0	605639	21	>100:1			1000.00	1007.51	98.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.710	1.711	0/0	313148	20	>100:1			500.00	491.56		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.076	2.077	0	641171	15	>100:1			1000.00	1031.98	101.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.076	2.088	0/0	337087	15	>100:1			500.00	489.83		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.141	1	190114	14	>100:1			1000.00	1007.06	98.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.141	1/0	103248	14	>100:1	Target = 3.41		442.00	416.88		
298.9 > 99	44	2.140	2.141		32454	14	>100:1	3.18 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.478	0/-1	77116	16	>100:1	Target = 2.92		469.00	470.99		
349 > 99	44	2.477	2.478		26216	17	>100:1	2.94 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.407	0	102808	17	>100:1			5000.00	4951.71	97.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.407	0/0	18470	16	>100:1	Target = 1.58		467.00	423.54		
327 > 81	63	2.406	2.407		12266	21	78:1	1.50 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.442	0	702501	18	>100:1			1000.00	1063.48	108.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.442	0/0	332895	18	>100:1	Target = 18.69		500.00	467.77		
313 > 119	49	2.441	2.442		17163	17	83:1	19.39 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.557	2.558	0	1188890	17	>100:1			5000.00	5033.75	97.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.557	2.558	0/0	157926	19	>100:1	Target = 0.78		1000.00	951.52		
285 > 185	66	2.557	2.558		212542	18	>100:1	0.74 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.817	2.818	1	558542	17	>100:1			1000.00	1042.12	97.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.817	2.818	1/0	310488	18	>100:1	Target = 3.75		500.00	497.77		
363 > 169	47	2.817	2.818		85493	16	>100:1	3.63 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.836	1	145666	17				1000.00	1023.37	99.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.826	2.836	0/-1	69268	26		Target = 2.79	0.19	455.00	432.86		
399 > 99	45	2.835	2.836		24997	26	>100:1	2.77 (1.39-4.19)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.853	2.864	0/-1	485304	18	>100:1	Target = 3.21		471.00	475.15		
377 > 85	45	2.863	2.864		149028	19	>100:1	3.25 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.212	3.208	1/0	73779	20	>100:1	Target = 3.03		476.00	481.22		
449 > 99	45	3.205	3.208		25359	23	>100:1	2.90 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.181	1	95803	21	>100:1			5000.00	5304.99	98.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.178	3.174	1/0	19725	24	>100:1	Target = 1.94		474.00	408.16		
427 > 81	64	3.172	3.174		11001	20	57:1	1.79 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.201	1	622484	21	>100:1			1000.00	1106.21	110.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.201	1/0	278713	18	>100:1	Target = 2.91		500.00	448.71		
413 > 169	53	3.205	3.201		104473	18	>100:1	2.66 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.577	1	149542	23	>100:1			1000.00	1041.61	100.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.585	1/0	73729	36	>100:1	Target = 3.38	0.24	464.00	432.45		
499 > 99	54	3.582	3.585		24294	36	>100:1	3.03 (1.69-5.07)	0.12				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.790	1/0	237691	19	>100:1			466.00	426.91		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.925	3.920	1/0	64177	23	>100:1	Target = 2.80		480.00	507.74		
549 > 99	54	3.925	3.920		22334	15	>100:1	2.87 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.231	4.237	1/0	57750	16	>100:1	Target = 3.15		482.00	469.08		
599 > 99	54	4.231	4.237		16767	13	59:1	3.44 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.393	4.398	1/0	229096	20	>100:1			471.00	475.07		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.745	4.742	1/0	51252	18	>100:1	Target = 3.01		484.00	476.09		
699 > 99	54	4.745	4.742		15788	18	>100:1	3.24 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.585	1	667765	19	>100:1			1000.00	1011.08	100.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.582	3.585	1/0	346478	19	>100:1	Target = 6.48		500.00	485.02		
463 > 169	56	3.582	3.585		51673	19	>100:1	6.70 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.863	1	299679	18	>100:1			1000.00	997.95	95.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.868	3.863	1/0	149731	19	>100:1	Target = 32.22		500.00	478.33		
498>478	55	3.860	3.863		4976	19	59:1	30.09 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.934	3.928	1	117042	17	>100:1			5000.00	5555.47	105.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.934	3.937	1/0	24968	15	>100:1	Target = 1.96		479.00	480.36		
527 > 81	65	3.934	3.937		10525	24	58:1	2.37 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.540	4.535	1/0	27714	23	>100:1	Target = 3.34		482.00	401.69		
627 > 80	65	4.540	4.535		10935	17	45:1	2.53 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.937	1	635220	18	>100:1			1000.00	1002.31	95.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.934	3.937	1/0	354543	18	>100:1	Target = 13.93		500.00	504.15		
513 > 169	51	3.942	3.937		23460	22	>100:1	15.11 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.102	4.098	1	642771	17	>100:1			5000.00	4795.32	96.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.102	4.107	0/-1	52858	31	>100:1	Target = 1.31	0.08	500.00	510.16		M
570 > 483	58	4.102	4.107		40074	32	>100:1	1.31 (0.65-1.97)	0.07				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.252	4.257	1	707166	16	>100:1			1000.00	1052.65	103.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.252	4.257	1/0	328922	16	>100:1	Target = 14.01		500.00	515.33		
563 > 169	52	4.252	4.257		22974	21	99:1	14.31 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.252	4.257	1	590881	17	>100:1			5000.00	4895.35	93.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.262	4.267	0/-1	64123	33	>100:1	Target = 1.75		500.00	526.45		M
584 > 526	60	4.262	4.267		35693	30	>100:1	1.79 (0.87-2.62)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.287	1	101502	15	>100:1			1000.00	970.25	97.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.302	4.308	1/0	60328	14	>100:1			500.00	524.86		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.312	4.308	1	54846	14	>100:1			1000.00	986.33	113.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.322	4.318	1/0	31097	17	>100:1	Target = 1.04		500.00	510.77		
512 > 219	57	4.312	4.318		29441	17	77:1	1.05 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.454	1	121008	16	>100:1			1000.00	1015.53	107.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.468	4.472	1/0	55274	14	>100:1			500.00	486.76		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.481	1	49207	16	>100:1			1000.00	964.57	97.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.486	4.481	1/0	27177	16	>100:1	Target = 1.05		500.00	479.57		
526 > 219	59	4.486	4.481		27053	18	>100:1	1.00 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.531	4.526	1	703607	17	>100:1			1000.00	1040.67	102.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.531	4.526	1/0	363994	18	>100:1	Target = 10.52		500.00	487.03		
613 > 169	38	4.531	4.526		32534	16	>100:1	11.18 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.772	4.769	1/0	306149	21	>100:1	Target = 7.51		500.00	480.02		
663 > 169	38	4.772	4.769		39750	24	>100:1	7.70 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.990	4.992	0	954477	20	>100:1			1000.00	1011.80	100.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.990	4.998	0/0	390674	20	74:1	Target = 11.12		500.00	496.39		
713 > 169	42	4.990	4.998		34439	18	>100:1	11.34 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.394	5.390	1	922972	19	>100:1			1000.00	999.77	99.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.394	5.390	1/0	336777	18	69:1	Target = 10.69		500.00	514.51		
813 > 269	40	5.394	5.390		30524	17	>100:1	11.03 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.772	5.775	1/0	411986	22	35:1	Target = 13.29		500.00	505.97		
913 > 319	40	5.772	5.775		30188	22	>100:1	13.64 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.934	3.937	1	710112	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.442	0	592976	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.201	1	590213	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.710	1.711	0	549732	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.577	1	147337	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021017.d
Injection Date: 20-Aug-2021 18:32:39 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 5 Auto Sampler: 5
Sample Info: F.L. ICAL 1000_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	1	612112	21	>100:1			1000.00	1018.28	100	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	1/0	653288	21	>100:1			1000.00	1014.64		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	629666	15	>100:1			1000.00	1013.46	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	681082	14	>100:1			1000.00	1007.78		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	193652	14	>100:1			1000.00	1025.80	100	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	222140	15	>100:1	Target = 3.41		884.00	880.53		
298.9 > 99	44	2.141	2.141		60033	14	>100:1	3.70 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	153029	16	>100:1	Target = 2.92		938.00	917.55		
349 > 99	44	2.478	2.478		56370	17	>100:1	2.71 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	105591	19	>100:1			5000.00	5085.75	100	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	42110	16	>100:1	Target = 1.58		934.00	940.18		
327 > 81	63	2.407	2.407		23480	15	>100:1	1.79 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	649325	18	>100:1			1000.00	982.98	100	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	1/0	731813	18	>100:1	Target = 18.69		1000.00	1112.53		
313 > 119	49	2.442	2.442		36016	15	>100:1	20.31 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	1	1220862	17	>100:1			5000.00	5169.12	100	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	1/0	346222	18	>100:1	Target = 0.78		2000.00	2071.32		
285 > 185	66	2.558	2.558		420655	17	>100:1	0.82 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	573719	17	>100:1			1000.00	1070.43	100	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	618730	18	>100:1	Target = 3.75		1000.00	965.70		
363 > 169	47	2.818	2.818		166927	18	>100:1	3.70 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	146711	17	>100:1			1000.00	1030.71	100	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/0	144349	25	>100:1	Target = 2.79	0.18	910.00	895.63		
399 > 99	45	2.836	2.836		51701	23	>100:1	2.79 (1.39-4.19)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/0	1048469	17	>100:1	Target = 3.21		942.00	1019.23		
377 > 85	45	2.854	2.864		295193	18	>100:1	3.55 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.208	1/0	142033	20	>100:1	Target = 3.03		952.00	919.81		
449 > 99	45	3.208	3.208		48434	19	>100:1	2.93 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.181	1	96908	20	>100:1			5000.00	5366.18	100	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.174	3.174	0/-1	43099	19	>100:1	Target = 1.94		948.00	881.65		
427 > 81	64	3.181	3.174		23661	19	>100:1	1.82 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.201	3.201	1	563802	20	>100:1			1000.00	1001.93	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.201	3.201	0/-1	574098	19	>100:1	Target = 2.91		1000.00	1020.46		
413 > 169	53	3.201	3.201		197614	21	>100:1	2.90 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.577	3.577	1	149352	19	>100:1			1000.00	1040.28	100	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	0/-1	147230	35	>100:1	Target = 3.38	0.25	928.00	864.66		M
499 > 99	54	3.577	3.585		41009	32	>100:1	3.59 (1.69-5.07)	0.07				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.790	3.790	1/0	472733	18	>100:1			932.00	850.14		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.920	3.920	0/-1	112465	18	>100:1	Target = 2.80		960.00	890.90		
549 > 99	54	3.928	3.920		43560	17	>100:1	2.58 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.237	1/0	111190	15	>100:1	Target = 3.15		964.00	904.30		
599 > 99	54	4.237	4.237		40963	15	>100:1	2.71 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.398	4.398	1/0	437971	18	>100:1			942.00	909.35		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.742	4.742	0/-1	95824	18	>100:1	Target = 3.01		968.00	891.25		
699 > 99	54	4.742	4.742		31954	19	>100:1	2.99 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.585	1	662557	18	>100:1			1000.00	1003.20	100	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.585	3.585	1/0	718216	19	>100:1	Target = 6.48		1000.00	1013.31		
463 > 169	56	3.585	3.585		108461	19	>100:1	6.62 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.863	0	313093	17	>100:1			1000.00	1042.62	100	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.863	0/0	330597	17	>100:1	Target = 32.22		1000.00	1010.88		
498>478	55	3.863	3.863		9562	16	87:1	34.57 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.928	3.928	0	110833	18	>100:1			5000.00	5260.76	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.937	1/1	51321	23	>100:1	Target = 1.96		958.00	1042.68		
527 > 81	65	3.928	3.937		25216	23	>100:1	2.03 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.535	4.535	0/0	65551	16	>100:1	Target = 3.34		964.00	1003.34		
627 > 80	65	4.535	4.535		17510	19	>100:1	3.74 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.937	3.937	1	663112	18	>100:1			1000.00	1046.32	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.937	3.937	1/0	690717	18	>100:1	Target = 13.93		1000.00	940.87		
513 > 169	51	3.945	3.937		54026	16	>100:1	12.78 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	663389	18	>100:1			5000.00	4949.14	100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	0/-1	107983	30	>100:1	Target = 1.31	0.08	1000.00	1009.81		M
570 > 483	58	4.098	4.107		82345	30	>100:1	1.31 (0.65-1.97)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.257	1	681974	16	>100:1			1000.00	1015.15	100	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.257	4.257	1/0	628447	15	>100:1	Target = 14.01		1000.00	1020.98		
563 > 169	52	4.257	4.257		46386	20	>100:1	13.54 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.257	4.257	1	633381	16	>100:1			5000.00	5247.46	100	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	0/-1	118761	33	>100:1	Target = 1.75		1000.00	909.60		M
584 > 526	60	4.257	4.267		73574	29	>100:1	1.61 (0.87-2.62)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.287	4.287	0	103682	12	>100:1			1000.00	991.09	100	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.308	4.308	1/1	125546	13	>100:1			1000.00	1069.30		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.308	4.308	0	48151	13	>100:1			1000.00	865.93	100	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.318	1/1	58635	14	>100:1	Target = 1.04		1000.00	1096.98		
512 > 219	57	4.318	4.318		69434	15	>100:1	0.84 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.454	4.454	0	112837	17	>100:1			1000.00	946.96	100	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.472	4.472	1/1	110078	17	>100:1			1000.00	1060.10		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.481	1	50649	14	>100:1			1000.00	992.84	100	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.481	4.481	0/-1	56768	15	>100:1	Target = 1.05		1000.00	973.23		
526 > 219	59	4.490	4.481		55660	14	>100:1	1.01 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.526	4.526	1	687538	17	>100:1			1000.00	1016.91	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.526	4.526	1/0	707248	16	>100:1	Target = 10.52		1000.00	968.43		
613 > 169	38	4.526	4.526		67838	16	>100:1	10.42 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.769	4.769	0/-1	644832	19	>100:1	Target = 7.51		1000.00	1034.67		
663 > 169	38	4.769	4.769		80078	20	>100:1	8.05 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.992	4.992	1	948336	20	>100:1			1000.00	1005.29	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	1/0	780181	21	>100:1	Target = 11.12		1000.00	997.72		
713 > 169	42	4.992	4.998		69024	21	>100:1	11.30 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.390	1	930923	18	>100:1			1000.00	1008.38	100	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.390	5.390	1/0	647029	18	>100:1	Target = 10.69		1000.00	980.06		
813 > 269	40	5.390	5.390		60650	19	>100:1	10.66 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.775	5.775	1/0	816461	23	72:1	Target = 13.29		1000.00	994.15		
913 > 319	40	5.775	5.775		60167	23	>100:1	13.56 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.937	3.937	1	779629	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	1	708776	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.201	3.201	1	635131	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	601915	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.577	3.577	0	152674	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021018.d
Injection Date: 20-Aug-2021 18:43:14 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 6 Auto Sampler: 6
Sample Info: F.L. ICAL 2000_SVLC-1601 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.709	1.711	0	610466	20	>100:1			1000.00	1015.54	99.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.711	1/1	1236213	22	>100:1			2000.00	1925.18		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.083	2.077	1	638720	17	>100:1			1000.00	1028.03	101.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.083	2.088	0/-1	1344258	16	>100:1			2000.00	1960.88		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.136	2.141	0	192763	15	>100:1			1000.00	1021.09	99.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.136	2.141	0/0	428637	15	>100:1	Target = 3.41		1768.00	1706.90		
298.9 > 99	44	2.136	2.141		122733	15	>100:1	3.49 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.478	0/0	299151	17	>100:1	Target = 2.92		1876.00	1801.96		
349 > 99	44	2.477	2.478		105394	17	>100:1	2.83 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.405	2.407	0	103421	18	>100:1			5000.00	4981.23	97.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.405	2.407	0/0	78061	17	>100:1	Target = 1.58		1868.00	1779.42		
327 > 81	63	2.405	2.407		45730	15	>100:1	1.70 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.442	0	676258	17	>100:1			1000.00	1023.76	104.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.442	0/0	1292511	18	>100:1	Target = 18.69		2000.00	1886.67		
313 > 119	49	2.441	2.442		71493	17	>100:1	18.07 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.557	2.558	0	1179535	17	>100:1			5000.00	4994.14	96.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.566	2.558	1/1	673221	18	>100:1	Target = 0.78		4000.00	4204.37		
285 > 185	66	2.557	2.558		821328	16	>100:1	0.81 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.817	2.818	0	531781	17	>100:1			1000.00	992.19	92.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.817	2.818	0/0	1133157	18	>100:1	Target = 3.75		2000.00	1908.08		
363 > 169	47	2.817	2.818		321383	17	>100:1	3.52 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.836	0	143590	16	>100:1			1000.00	1008.78	97.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.836	0/0	284958	25	>100:1	Target = 2.79	0.19	1820.00	1806.48		
399 > 99	45	2.826	2.836		90177	24	>100:1	3.15 (1.39-4.19)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.853	2.864	0/0	1869067	18	>100:1	Target = 3.21		1884.00	1856.43		
377 > 85	45	2.853	2.864		602367	18	>100:1	3.10 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.205	3.208	0/0	280561	21		Target = 3.03		1904.00	1856.42		
449 > 99	45	3.211	3.208		96115	20	>100:1	2.91 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.181	0	89901	21	>100:1			5000.00	4978.18	92.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.178	3.174	1/1	86244	22	>100:1	Target = 1.94		1896.00	1901.74		
427 > 81	64	3.178	3.174		47289	22	>100:1	1.82 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.201	1	567014	21	>100:1			1000.00	1007.64	100.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.201	1/0	1123021	21	>100:1	Target = 2.91		2000.00	1984.86		
413 > 169	53	3.198	3.201		387413	20	>100:1	2.89 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.574	3.577	0	145329	18	>100:1			1000.00	1012.26	97.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.585	0/0	287856	36	>100:1	Target = 3.38	0.27	1856.00	1737.33		
499 > 99	54	3.582	3.585		85418	34	>100:1	3.36 (1.69-5.07)	0.11				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.790	0/0	955915	19	>100:1			1864.00	1766.65		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.925	3.920	1/1	232614	20	>100:1	Target = 2.80		1920.00	1893.68		
549 > 99	54	3.925	3.920		84669	21	>100:1	2.74 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.231	4.237	0/0	218005	17		Target = 3.15		1928.00	1822.09		
599 > 99	54	4.231	4.237		82711	14		2.63 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.393	4.398	0/0	867006	17	>100:1			1884.00	1849.99		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.745	4.742	1/1	191397	20	>100:1	Target = 3.01		1936.00	1829.45		
699 > 99	54	4.745	4.742		64681	20		2.95 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.585	0	656460	19	>100:1			1000.00	993.97	99.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.590	3.585	1/1	1449947	19	>100:1	Target = 6.48		2000.00	2064.68		
463 > 169	56	3.582	3.585		205213	19	>100:1	7.06 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.863	1	292074	18	>100:1			1000.00	972.62	93.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.868	3.863	1/0	651566	18	>100:1	Target = 32.22		2000.00	2135.69		
498>478	55	3.868	3.863		21690	19	>100:1	30.03 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.934	3.928	1	101902	22	>100:1			5000.00	4836.84	91.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.934	3.937	0/-1	87937	18	>100:1	Target = 1.96		1916.00	1943.18		
527 > 81	65	3.934	3.937		47528	17	>100:1	1.85 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.540	4.535	1/0	130889	17	>100:1	Target = 3.34		1928.00	2179.00		
627 > 80	65	4.540	4.535		39902	15	>100:1	3.28 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.937	0	668235	17	>100:1			1000.00	1054.40	100.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.942	3.937	1/1	1361950	18	>100:1	Target = 13.93		2000.00	1840.97		
513 > 169	51	3.942	3.937		109209	16	>100:1	12.47 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.098	0	667120	17	>100:1			5000.00	4976.97	100.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.102	4.107	0/0	202444	33	>100:1	Target = 1.31	0.12	2000.00	1882.58		M
570 > 483	58	4.102	4.107		155150	31	>100:1	1.30 (0.65-1.97)	0.24				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.251	4.257	0	718387	16	>100:1			1000.00	1069.35	105.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.251	4.257	0/0	1330419	17	>100:1	Target = 14.01		2000.00	2051.85		
563 > 169	52	4.251	4.257		85070	15	>100:1	15.63 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.251	4.257	0	634337	17	>100:1			5000.00	5255.38	100.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.262	4.267	0/0	228005	33	>100:1	Target = 1.75		2000.00	1743.68		M
584 > 526	60	4.262	4.267		147383	30	>100:1	1.54 (0.87-2.62)	0.08				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.287	1	104751	14	>100:1			1000.00	1001.31	101	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.302	4.308	0/-1	245246	18	>100:1			2000.00	2067.49		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.312	4.308	1	53297	12	>100:1			1000.00	958.47	110.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.312	4.318	0/-1	113421	20	>100:1	Target = 1.04		2000.00	1917.08		
512 > 219	57	4.312	4.318		110895	15	>100:1	1.02 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.454	1	128976	16	>100:1			1000.00	1082.40	114.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.468	4.472	0/-1	224606	16	>100:1			2000.00	1906.58		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.481	0	54627	14	>100:1			1000.00	1070.81	107.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.486	4.481	1/1	112185	14	>100:1	Target = 1.05		2000.00	1783.23		
526 > 219	59	4.486	4.481		108358	15	>100:1	1.03 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.531	4.526	1	694489	17	>100:1			1000.00	1027.19	101	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.531	4.526	1/0	1453655	18	>100:1	Target = 10.52		2000.00	1970.56		
613 > 169	38	4.531	4.526		133748	17	>100:1	10.86 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.772	4.769	1/0	1203300	21	>100:1	Target = 7.51		2000.00	1911.44		
663 > 169	38	4.772	4.769		151987	21	>100:1	7.91 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.996	4.992	1	937013	20	>100:1			1000.00	993.28	98.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.996	4.998	0/-1	1515197	21	>100:1	Target = 11.12		2000.00	1961.10		
713 > 169	42	4.996	4.998		132776	18	>100:1	11.41 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.394	5.390	1	909846	18	>100:1			1000.00	985.55	97.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.394	5.390	1/0	1258523	18	>100:1	Target = 10.69		2000.00	1950.45		
813 > 269	40	5.394	5.390		119138	18	>100:1	10.56 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.772	5.775	0/-1	1599314	23	>100:1	Target = 13.29		2000.00	1992.49		
913 > 319	40	5.772	5.775		119627	22	>100:1	13.36 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.942	3.937	1	695301	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.442	0	594798	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.201	1	573295	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.709	1.711	0	558882	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.577	1	141674	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021019.d
Injection Date: 20-Aug-2021 18:53:48 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 7 Auto Sampler: 7
Sample Info: F.L. ICAL 5000_SVLC-1602 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.710	1.711	0	587119	21	>100:1			1000.00	976.70	95.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.717	1.711	1/1	3219153	22	>100:1			5000.00	5212.61		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.087	2.077	1	615520	17	>100:1			1000.00	990.69	97.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.087	2.088	0/-1	3365607	16	>100:1			5000.00	5094.48		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.141	0	185921	15	>100:1			1000.00	984.85	96	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.141	0/0	1070949	15	>100:1	Target = 3.41		4420.00	4421.62		
298.9 > 99	44	2.140	2.141		315667	15	>100:1	3.39 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.478	0/0	751218	18	>100:1	Target = 2.92		4690.00	4691.55		
349 > 99	44	2.477	2.478		275583	16	>100:1	2.72 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.407	0	105760	17	>100:1			5000.00	5093.89	100.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.407	0/0	198222	18	>100:1	Target = 1.58		4670.00	4418.58		
327 > 81	63	2.406	2.407		115975	17	>100:1	1.70 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.442	0	679627	17	>100:1			1000.00	1028.86	104.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.442	1/1	3126342	17	>100:1	Target = 18.69		5000.00	4540.88		
313 > 119	49	2.450	2.442		175427	16	>100:1	17.82 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.557	2.558	0	1199862	17	>100:1			5000.00	5080.21	98.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.557	2.558	0/0	1593376	19	>100:1	Target = 0.78		10000	9828.96		
285 > 185	66	2.566	2.558		2111620	18	>100:1	0.75 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.817	2.818	0	556560	18	>100:1			1000.00	1038.42	97	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.817	2.818	0/0	2937550	18	>100:1	Target = 3.75		5000.00	4726.21		
363 > 169	47	2.817	2.818		795012	17	>100:1	3.69 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.836	0	140160	16				1000.00	984.69	95.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.836	0/0	677621	25	>100:1	Target = 2.79	0.18	4550.00	4400.88		
399 > 99	45	2.835	2.836		241583	23	>100:1	2.80 (1.39-4.19)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.864	0/0	4880359	18	>100:1	Target = 3.21		4710.00	4966.00		
377 > 85	45	2.862	2.864		1459920	18	>100:1	3.34 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.211	3.208	1/1	709902	21	>100:1	Target = 3.03		4760.00	4812.24		
449 > 99	45	3.211	3.208		238156	20	>100:1	2.98 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.181	0	95227	20	>100:1			5000.00	5273.10	98.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.178	3.174	1/1	207283	21	>100:1	Target = 1.94		4740.00	4315.10		
427 > 81	64	3.178	3.174		104116	20	>100:1	1.99 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.201	1	562582	31	>100:1			1000.00	999.76	99.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.201	1/0	2781307	22	>100:1	Target = 2.91		5000.00	4954.49		
413 > 169	53	3.205	3.201		966953	22	>100:1	2.87 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.577	1	136973	19	>100:1			1000.00	954.06	91.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.585	0/-1	756612	39	>100:1	Target = 3.38	0.25	4640.00	4845.04		M
499 > 99	54	3.582	3.585		220292	37	>100:1	3.43 (1.69-5.07)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.795	3.790	1/0	2516829	19	>100:1			4660.00	4935.18		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.934	3.920	1/0	631067	18	>100:1	Target = 2.80		4800.00	5450.83		
549 > 99	54	3.925	3.920		205635	18	>100:1	3.06 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.241	4.237	1/0	552439	16	>100:1	Target = 3.15		4820.00	4898.99		
599 > 99	54	4.241	4.237		202613	16	>100:1	2.72 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.393	4.398	0/-1	2207357	19	>100:1			4710.00	4997.31		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.745	4.742	1/0	518476	19	>100:1	Target = 3.01		4840.00	5258.14		
699 > 99	54	4.745	4.742		171357	19	>100:1	3.02 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.590	3.585	1	659112	19	>100:1			1000.00	997.98	99.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.590	3.585	1/0	3641124	20	>100:1	Target = 6.48		5000.00	5164.00		
463 > 169	56	3.590	3.585		552178	20	>100:1	6.59 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.863	1	303889	18	>100:1			1000.00	1011.97	97.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.868	3.863	1/0	1545315	19	>100:1	Target = 32.22		5000.00	4868.27		
498>478	55	3.876	3.863		46244	19	>100:1	33.41 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.934	3.928	1	111403	18				5000.00	5287.81	100.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.934	3.937	0/-1	216123	23	>100:1	Target = 1.96		4790.00	4368.46		
527 > 81	65	3.934	3.937		117922	16		1.83 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.540	4.535	1/0	275213	18		Target = 3.34		4820.00	4190.91		
627 > 80	65	4.540	4.535		86984	17	>100:1	3.16 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.942	3.937	1	644402	19	>100:1			1000.00	1016.80	97.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.942	3.937	1/0	3616950	19	>100:1	Target = 13.93		5000.00	5069.91		
513 > 169	51	3.942	3.937		261146	19	>100:1	13.85 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.102	4.098	1	658383	17	>100:1			5000.00	4911.79	99.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.102	4.107	0/-1	554884	32	>100:1	Target = 1.31	0.08	5000.00	5228.49		M
570 > 483	58	4.102	4.107		425198	31	>100:1	1.30 (0.65-1.97)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.251	4.257	0	713170	15	>100:1			1000.00	1061.58	104.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.251	4.257	0/0	2959092	17	>100:1	Target = 14.01		5000.00	4597.06		
563 > 169	52	4.251	4.257		235354	17	>100:1	12.57 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.262	4.257	1	614587	16	>100:1			5000.00	5091.75	97	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.262	4.267	0/-1	610084	35	>100:1	Target = 1.75		5000.00	4815.58		M
584 > 526	60	4.262	4.267		369109	30	>100:1	1.65 (0.87-2.62)	0.22				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.287	1	105919	15	>100:1			1000.00	1012.47	102.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.302	4.308	0/-1	579685	14	>100:1			5000.00	4833.01		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.312	4.308	1	58268	14	>100:1			1000.00	1047.87	121	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.322	4.318	1/0	297352	14	>100:1	Target = 1.04		5000.00	4597.16		
512 > 219	57	4.312	4.318		304415	15	>100:1	0.97 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.454	1	113367	20	>100:1			1000.00	951.41	100.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.468	4.472	0/-1	522231	17	>100:1			5000.00	5073.08		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.481	0	51734	15	>100:1			1000.00	1014.10	102.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.486	4.481	1/1	289472	14	>100:1	Target = 1.05		5000.00	4858.60		
526 > 219	59	4.486	4.481		291546	15	>100:1	0.99 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.531	4.526	1	666493	17	>100:1			1000.00	985.78	96.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.531	4.526	1/0	3658303	17	>100:1	Target = 10.52		5000.00	5167.46		
613 > 169	38	4.531	4.526		343411	16	>100:1	10.65 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.772	4.769	1/0	3119064	21	>100:1	Target = 7.51		5000.00	5162.76		
663 > 169	38	4.772	4.769		409058	19	>100:1	7.62 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.996	4.992	1	939910	21	>100:1			1000.00	996.36	99.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.996	4.998	0/-1	3940465	21	>100:1	Target = 11.12		5000.00	5084.39		
713 > 169	42	4.996	4.998		354026	21	>100:1	11.13 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.394	5.390	1	906520	18	>100:1			1000.00	981.95	97.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.394	5.390	1/0	3186899	18	>100:1	Target = 10.69		5000.00	4957.14		
813 > 269	40	5.394	5.390		292697	18	>100:1	10.88 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.779	5.775	1/0	4161065	24	>100:1	Target = 13.29		5000.00	5203.03		
913 > 319	40	5.772	5.775		306405	24	>100:1	13.58 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.942	3.937	1	722568	16	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.442	1	647550	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.201	1	573964	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.710	1.711	0	569173	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.577	1	157483	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021020.d
Injection Date: 20-Aug-2021 19:04:29 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 8 Auto Sampler: 8
Sample Info: F.L. ICAL 10000_SVLC-1603 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.711	1	564178	21	>100:1			1000.00	938.54	92.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.711	1/0	6101356	20	>100:1			10000	10281		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	571146	16	>100:1			1000.00	919.27	90.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	6393414	16	>100:1			10000	10430		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	184892	15	>100:1			1000.00	979.40	95.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	2067873	15	>100:1	Target = 3.41		8840.00	8585.13		
298.9 > 99	44	2.141	2.141		596254	15	>100:1	3.46 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	1512306	17	>100:1	Target = 2.92		9380.00	9497.31		
349 > 99	44	2.478	2.478		502679	17	>100:1	3.00 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	90095	18	>100:1			5000.00	4339.39	85.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	397050	18		Target = 1.58		9340.00	10390		
327 > 81	63	2.407	2.407		214041	17	>100:1	1.85 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	650218	17	>100:1			1000.00	984.34	100.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	1/0	6457352	17	>100:1	Target = 18.69		10000	9803.24		
313 > 119	49	2.442	2.442		344259	17	>100:1	18.75 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	1	1100763	17	>100:1			5000.00	4660.62	90.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	1/0	3035092	18	>100:1	Target = 0.78		20000	20446		
285 > 185	66	2.558	2.558		3871720	18	>100:1	0.78 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	486423	18	>100:1			1000.00	907.56	84.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	5578232	17	>100:1	Target = 3.75		10000	10269		
363 > 169	47	2.818	2.818		1451036	18	>100:1	3.84 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	131665	16	>100:1			1000.00	925.00	89.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/1	1347727	25	>100:1	Target = 2.79	0.18	9100.00	9317.69		
399 > 99	45	2.836	2.836		461608	23	>100:1	2.91 (1.39-4.19)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/1	8558305	18	>100:1	Target = 3.21		9420.00	9270.35		
377 > 85	45	2.864	2.864		2861770	18	>100:1	2.99 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.208	1/1	1286185	21	>100:1	Target = 3.03		9520.00	9281.24		
449 > 99	45	3.208	3.208		420588	20	>100:1	3.05 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.181	1	76778	22	>100:1			5000.00	4251.50	79.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.174	1/0	384014	20	>100:1	Target = 1.94		9480.00	9915.11		
427 > 81	64	3.181	3.174		210423	21	>100:1	1.82 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.201	3.201	1	528654	20	>100:1			1000.00	939.47	93.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.201	1/0	5041221	21	>100:1	Target = 2.91		10000	9556.53		
413 > 169	53	3.208	3.201		1822980	21	>100:1	2.76 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.577	3.577	1	127494	19	>100:1			1000.00	888.04	85.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	1/0	1415095	36	>100:1	Target = 3.38	0.24	9280.00	9735.42		
499 > 99	54	3.585	3.585		401966	35	>100:1	3.52 (1.69-5.07)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.790	3.790	1/0	5038015	20	>100:1			9320.00	10613		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.928	3.920	1/0	1037239	17	>100:1	Target = 2.80		9600.00	9625.23		
549 > 99	54	3.928	3.920		378144	18	>100:1	2.74 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.237	1/0	1118121	16	>100:1	Target = 3.15		9640.00	10653		
599 > 99	54	4.237	4.237		392675	15	>100:1	2.84 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.398	4.398	1/0	4050762	17	>100:1			9420.00	9852.48		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.748	4.742	1/0	960798	19	>100:1	Target = 3.01		9680.00	10468		
699 > 99	54	4.748	4.742		324286	20	>100:1	2.96 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.585	1	619854	19	>100:1			1000.00	938.54	93.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.585	3.585	1/0	6601252	19	>100:1	Target = 6.48		10000	9955.12		
463 > 169	56	3.585	3.585		1102429	18	>100:1	5.98 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.863	1	302094	19	>100:1			1000.00	1005.99	96.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.871	3.863	1/0	3059971	18	>100:1	Target = 32.22		10000	9697.23		
498>478	55	3.871	3.863		92718	16	>100:1	33.00 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.928	3.928	1	91945	18	>100:1			5000.00	4364.23	83	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.928	3.937	0/-1	391187	18	>100:1	Target = 1.96		9580.00	9580.33		
527 > 81	65	3.928	3.937		217201	18		1.80 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.544	4.535	1/0	556426	17	>100:1	Target = 3.34		9640.00	10266		
627 > 80	65	4.544	4.535		169157	18	>100:1	3.28 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.937	3.937	1	568927	17	>100:1			1000.00	897.71	85.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.937	3.937	1/0	6513843	18	>100:1	Target = 13.93		10000	10342		
513 > 169	51	3.937	3.937		460471	17	>100:1	14.14 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	628356	19	56:1			5000.00	4687.78	94.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	1/0	1037523	36	>100:1	Target = 1.31	0.09	10000	10243		M
570 > 483	58	4.107	4.107		780396	34	>100:1	1.32 (0.65-1.97)	0.13				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.257	1	591970	17	>100:1			1000.00	881.17	86.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.257	4.257	1/0	5839085	17	>100:1	Target = 14.01		10000	10928		
563 > 169	52	4.257	4.257		390656	15	>100:1	14.94 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.257	4.257	1	552410	17	>100:1			5000.00	4576.63	87.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	1/0	1076050	35	>100:1	Target = 1.75		10000	9449.59		M
584 > 526	60	4.267	4.267		692291	28	>100:1	1.55 (0.87-2.62)	0.25				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.297	4.287	1	97578	15	>100:1			1000.00	932.74	94.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.297	4.308	0/-1	1134073	15	>100:1			10000	10263		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.308	1	53535	13	>100:1			1000.00	962.75	111.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.318	1/0	574787	14	>100:1	Target = 1.04		10000	9672.04		
512 > 219	57	4.318	4.318		555453	14	>100:1	1.03 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.454	4.454	1	110085	17	>100:1			1000.00	923.86	97.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.472	4.472	1/0	1095194	16	>100:1			10000	10977		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.481	1	47473	15	>100:1			1000.00	930.58	93.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.490	4.481	1/0	547722	14	>100:1	Target = 1.05		10000	10018		
526 > 219	59	4.490	4.481		535154	17	>100:1	1.02 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.526	1	602897	16	>100:1			1000.00	891.72	87.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.526	4.526	1/0	6989310	17	>100:1	Target = 10.52		10000	10914		
613 > 169	38	4.535	4.526		640442	17	>100:1	10.91 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.775	4.769	1/0	5683818	21	>100:1	Target = 7.51		10000	10400		
663 > 169	38	4.775	4.769		712567	20	>100:1	7.97 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.992	1	923612	20	>100:1			1000.00	979.08	97.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	1/0	7433394	21	>100:1	Target = 11.12		10000	9760.56		
713 > 169	42	4.998	4.998		671566	20	>100:1	11.06 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.390	1	886879	18	>100:1			1000.00	960.67	95.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.399	5.390	1/0	5987157	19	>100:1	Target = 10.69		10000	9519.12		
813 > 269	40	5.399	5.390		540841	19	>100:1	11.07 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.775	5.775	1/0	7934814	23	>100:1	Target = 13.29		10000	10141		
913 > 319	40	5.775	5.775		586501	22	>100:1	13.52 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.937	3.937	1	665972	18							
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	1	611274	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.201	1	544064	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	1	530685	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	140620	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021021.d
Injection Date: 20-Aug-2021 19:15:07 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 9 Auto Sampler: 9
Sample Info: F.L. ICAL 15000_SVLC-1604 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	584822	21	>100:1			1000.00	972.88	95.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	8729100	20	>100:1			15000	14190		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	597215	15	>100:1			1000.00	961.23	94.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	0/-1	9045341	16	>100:1			15000	14111		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	0	181449	16	>100:1			1000.00	961.16	93.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	0/0	3068986	15	>100:1	Target = 3.41		13260	12983		
298.9 > 99	44	2.141	2.141		887132	15	>100:1	3.45 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	0/0	2273641	18	>100:1	Target = 2.92		14070	14549		
349 > 99	44	2.478	2.478		776890	17	>100:1	2.92 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	0	109769	18	>100:1			5000.00	5286.98	104	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	0/0	612321	17	>100:1	Target = 1.58		14010	13151		
327 > 81	63	2.407	2.407		320510	17	>100:1	1.91 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	0	626964	17	>100:1			1000.00	949.13	96.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.451	2.442	1/1	9255741	17	>100:1	Target = 18.69		15000	14573		
313 > 119	49	2.451	2.442		496375	17	>100:1	18.64 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1146635	18	>100:1			5000.00	4854.85	93.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.558	1/1	4800030	17	>100:1	Target = 0.78		30000	31060		
285 > 185	66	2.558	2.558		5910549	18	>100:1	0.81 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	512919	17	>100:1			1000.00	956.99	89.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	8577524	17	>100:1	Target = 3.75		15000	14975		
363 > 169	47	2.818	2.818		2324720	17	>100:1	3.68 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	140562	17	>100:1			1000.00	987.51	95.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	0/0	2111891	26	>100:1	Target = 2.79	0.19	13650	13677		
399 > 99	45	2.836	2.836		665867	23	>100:1	3.17 (1.39-4.19)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.864	0/0	12642418	18	>100:1	Target = 3.21		14130	12827		
377 > 85	45	2.863	2.864		4291757	18	>100:1	2.94 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.214	3.208	1/1	1886863	21	>100:1	Target = 3.03		14280	12754		
449 > 99	45	3.214	3.208		628078	21	>100:1	3.00 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.181	0	84679	21	>100:1			5000.00	4689.01	87.4	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.174	1/1	548414	21	>100:1	Target = 1.94		14220	12839		
427 > 81	64	3.181	3.174		294398	21	>100:1	1.86 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.207	3.201	1	511773	21	>100:1			1000.00	909.47	90.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.207	3.201	1/0	7258570	22	>100:1	Target = 2.91		15000	14214		
413 > 169	53	3.207	3.201		2538105	22	>100:1	2.85 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	139567	20	>100:1			1000.00	972.13	93.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	0/-1	2190505	35	>100:1	Target = 3.38	0.25	13920	13766		
499 > 99	54	3.585	3.585		645124	35	>100:1	3.39 (1.69-5.07)	0.07				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.797	3.790	1/0	7048212	19	>100:1			13980	13564		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.927	3.920	1/0	1646014	17	>100:1	Target = 2.80		14400	13953		
549 > 99	54	3.927	3.920		605858	16	>100:1	2.71 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.236	4.237	0/-1	1600175	16	>100:1	Target = 3.15		14460	13926		
599 > 99	54	4.236	4.237		603907	17	>100:1	2.64 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.397	4.398	0/-1	6147735	18	>100:1			14130	13659		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.747	4.742	1/0	1486002	19	>100:1	Target = 3.01		14520	14790		
699 > 99	54	4.747	4.742		488780	20	>100:1	3.04 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.593	3.585	1	622392	19	>100:1			1000.00	942.38	93.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.593	3.585	1/0	9819541	20	>100:1	Target = 6.48		15000	14748		
463 > 169	56	3.593	3.585		1578175	19	>100:1	6.22 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.870	3.863	1	285379	19	>100:1			1000.00	950.33	91.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.870	3.863	1/0	4591315	18	>100:1	Target = 32.22		15000	15402		
498>478	55	3.870	3.863		150076	18		30.59 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.936	3.928	1	99927	20	>100:1			5000.00	4743.10	90.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.936	3.937	0/-1	594990	18	>100:1	Target = 1.96		14370	13408		
527 > 81	65	3.936	3.937		307796	19	>100:1	1.93 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.543	4.535	1/0	792371	18	>100:1	Target = 3.34		14460	13452		
627 > 80	65	4.543	4.535		261138	18	>100:1	3.03 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.944	3.937	1	583061	19	>100:1			1000.00	920.01	87.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.944	3.937	1/0	9149023	18	>100:1	Target = 13.93		15000	14173		
513 > 169	51	3.944	3.937		669746	18	>100:1	13.66 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.097	4.098	0	650892	17	48:1			5000.00	4855.91	98.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.106	4.107	0/0	1513360	32	>100:1	Target = 1.31	0.09	15000	14424		M
570 > 483	58	4.106	4.107		1161997	33	>100:1	1.30 (0.65-1.97)	0.11				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.256	4.257	0	623669	15	>100:1			1000.00	928.36	91.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.256	4.257	0/0	7907917	17	>100:1	Target = 14.01		15000	14048		
563 > 169	52	4.256	4.257		593867	15	>100:1	13.31 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.256	4.257	0	539669	17	>100:1			5000.00	4471.07	85.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.266	4.267	0/0	1619854	40	>100:1	Target = 1.75		15000	14561		M
584 > 526	60	4.266	4.267		1005058	31	>100:1	1.61 (0.87-2.62)	0.05				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.296	4.287	1	101335	13	>100:1			1000.00	968.66	97.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.307	4.308	0/-1	1674285	16	>100:1			15000	14590		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.317	4.308	1	54939	14	>100:1			1000.00	988.00	114.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.317	4.318	0/-1	900260	13	>100:1	Target = 1.04		15000	14762		
512 > 219	57	4.317	4.318		833282	14	>100:1	1.08 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.462	4.454	1	126899	21	>100:1			1000.00	1064.97	112.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.471	4.472	0/-1	1644166	17	>100:1			15000	14301		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.480	4.481	0	54770	18	>100:1			1000.00	1073.62	108.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.489	4.481	1/1	808230	14	>100:1	Target = 1.05		15000	12814		
526 > 219	59	4.489	4.481		851023	15	>100:1	0.94 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.534	4.526	1	650076	18	>100:1			1000.00	961.50	94.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.534	4.526	1/0	9641203	18	>100:1	Target = 10.52		15000	13962		
613 > 169	38	4.534	4.526		980376	17	>100:1	9.83 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.774	4.769	1/0	8586495	21	>100:1	Target = 7.51		15000	14572		
663 > 169	38	4.774	4.769		1087828	21	>100:1	7.89 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.997	4.992	1	934427	21	>100:1			1000.00	990.54	98.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.997	4.998	0/-1	11271630	21	>100:1	Target = 11.12		15000	14629		
713 > 169	42	4.997	4.998		1041990	21	>100:1	10.81 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.395	5.390	1	918543	17	>100:1			1000.00	994.97	98.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.395	5.390	1/0	8844370	19	>100:1	Target = 10.69		15000	13577		
813 > 269	40	5.395	5.390		830964	17	>100:1	10.64 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.780	5.775	1/0	11582563	23	>100:1	Target = 13.29		15000	14293		
913 > 319	40	5.780	5.775		901183	24	>100:1	12.85 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.944	3.937	1	664793	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	601331	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.207	3.201	1	546360	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	545012	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	136839	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021022.d
Injection Date: 20-Aug-2021 19:25:46 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 10 Auto Sampler: 10
Sample Info: F.L. ICAL 20000_SVLC-1605 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	578242	21	>100:1			1000.00	961.93	94.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	11698456	20	>100:1			20000	19234		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	595547	17	>100:1			1000.00	958.54	94.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	12224455	16	>100:1			20000	19125		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	191379	15	>100:1			1000.00	1013.76	98.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	4282258	15	>100:1	Target = 3.41		17680	17176		
298.9 > 99	44	2.141	2.141		1234203	15	>100:1	3.46 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	3127331	18	>100:1	Target = 2.92		18760	18974		
349 > 99	44	2.478	2.478		1063777	18	>100:1	2.93 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	101193	17	>100:1			5000.00	4873.92	95.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	850663	17	>100:1	Target = 1.58		18680	19818		
327 > 81	63	2.407	2.407		456129	17	>100:1	1.86 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	658569	17	>100:1			1000.00	996.98	101.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.451	2.442	1/0	12481442	17	>100:1	Target = 18.69		20000	18708		
313 > 119	49	2.451	2.442		681665	17	>100:1	18.31 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	1	1129452	18	>100:1			5000.00	4782.09	92.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.558	1/0	6102749	18	>100:1	Target = 0.78		40000	40100		
285 > 185	66	2.558	2.558		7848682	18	>100:1	0.77 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	515988	17	>100:1			1000.00	962.72	89.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	10770688	17	>100:1	Target = 3.75		20000	18691		
363 > 169	47	2.818	2.818		3056003	17	>100:1	3.52 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	138655	17	>100:1			1000.00	974.11	94.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	0/0	2790272	26	>100:1	Target = 2.79	0.19	18200	18318		
399 > 99	45	2.836	2.836		899042	25	>100:1	3.10 (1.39-4.19)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	0/0	17705889	18	>100:1	Target = 3.21		18840	18212		
377 > 85	45	2.864	2.864		5921213	17	>100:1	2.99 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.214	3.208	1/1	2558734	21	>100:1	Target = 3.03		19040	17533		
449 > 99	45	3.214	3.208		877863	21	>100:1	2.91 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.174	3.181	0	88328	23	>100:1			5000.00	4891.07	91.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.174	1/1	764397	21	>100:1	Target = 1.94		18960	17156		
427 > 81	64	3.181	3.174		404783	22		1.88 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.201	1	505909	21	>100:1			1000.00	899.05	89.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.201	1/0	10183303	22	>100:1	Target = 2.91		20000	20172		
413 > 169	53	3.208	3.201		3567995	22	>100:1	2.85 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	139425	19	>100:1			1000.00	971.14	93.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	1/0	2975961	36	>100:1	Target = 3.38	0.27	18560	18722		
499 > 99	54	3.585	3.585		860339	37	>100:1	3.45 (1.69-5.07)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.799	3.790	1/0	9812083	19	>100:1			18640	18902		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.929	3.920	1/0	2188171	18	>100:1	Target = 2.80		19200	18568		
549 > 99	54	3.929	3.920		786359	17	>100:1	2.78 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.237	1/0	2144604	16	>100:1	Target = 3.15		19280	18684		
599 > 99	54	4.237	4.237		813758	16	>100:1	2.63 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.398	4.398	1/0	8489696	17	>100:1			18840	18882		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.749	4.742	1/0	2078076	19	>100:1	Target = 3.01		19360	20704		
699 > 99	54	4.749	4.742		678088	20	>100:1	3.06 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.585	1	642472	20	>100:1			1000.00	972.79	97	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.593	3.585	1/0	12827321	19	>100:1	Target = 6.48		20000	18663		
463 > 169	56	3.593	3.585		2071412	20	>100:1	6.19 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.863	1	285337	18	>100:1			1000.00	950.19	91.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.871	3.863	1/0	6374421	18	>100:1	Target = 32.22		20000	21387		
498>478	55	3.871	3.863		201085	18	>100:1	31.70 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.928	1	100773	17	>100:1			5000.00	4783.25	90.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.937	1/0	783311	19	>100:1	Target = 1.96		19160	17503		
527 > 81	65	3.937	3.937		418835	19	>100:1	1.87 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.545	4.535	1/0	1050772	18	>100:1	Target = 3.34		19280	17689		
627 > 80	65	4.545	4.535		315948	16	>100:1	3.32 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.946	3.937	1	605500	17	>100:1			1000.00	955.41	91.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.946	3.937	1/0	12756096	18	>100:1	Target = 13.93		20000	19029		
513 > 169	51	3.946	3.937		993945	19	>100:1	12.83 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	711283	17	46:1			5000.00	5306.45	107.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	1/0	2117179	35	>100:1	Target = 1.31	0.10	20000	18466		M
570 > 483	58	4.107	4.107		1597349	31	>100:1	1.32 (0.65-1.97)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.258	4.257	1	581276	16	>100:1			1000.00	865.25	85.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.258	4.257	1/0	10554003	16	>100:1	Target = 14.01		20000	20116		
563 > 169	52	4.258	4.257		807010	15	>100:1	13.07 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.258	4.257	1	557940	15	>100:1			5000.00	4622.44	88.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.268	4.267	1/0	2133709	32	>100:1	Target = 1.75		20000	18552		M
584 > 526	60	4.268	4.267		1405459	31	>100:1	1.51 (0.87-2.62)	0.27				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.287	1	107812	13	>100:1			1000.00	1030.57	104	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.308	4.308	1/0	2246287	15	>100:1			20000	18399		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.308	4.308	1	63557	16	>100:1			1000.00	1142.98	132	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.318	1/0	1196662	14	>100:1	Target = 1.04		20000	16961		
512 > 219	57	4.318	4.318		1134829	15	>100:1	1.05 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.455	4.454	1	119758	15	>100:1			1000.00	1005.04	106.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.473	4.472	1/0	2318868	16	>100:1			20000	21382		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.482	4.481	1	49401	15	>100:1			1000.00	968.37	97.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.491	4.481	1/0	1132684	14	>100:1	Target = 1.05		20000	19909		
526 > 219	59	4.491	4.481		1145014	15	>100:1	0.98 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.527	4.526	1	651030	18	>100:1			1000.00	962.91	94.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.536	4.526	1/0	12839569	18	>100:1	Target = 10.52		20000	18567		
613 > 169	38	4.536	4.526		1253804	16	>100:1	10.24 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.776	4.769	1/0	11093078	21	>100:1	Target = 7.51		20000	18798		
663 > 169	38	4.776	4.769		1519190	19	>100:1	7.30 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.992	1	966619	21	>100:1			1000.00	1024.67	101.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	0/-1	14140854	21	>100:1	Target = 11.12		20000	17742		
713 > 169	42	4.998	4.998		1372085	21	>100:1	10.30 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.390	1	931649	18	>100:1			1000.00	1009.17	100.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.399	5.390	1/0	11931134	19	>100:1	Target = 10.69		20000	18058		
813 > 269	40	5.399	5.390		1128684	19	>100:1	10.57 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.782	5.775	1/0	15720730	24	>100:1	Target = 13.29		20000	19127		
913 > 319	40	5.782	5.775		1247742	24	>100:1	12.59 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.946	3.937	1	701785	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.442	1	613844	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.201	1	532997	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	544810	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	146571	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021023.d		
Injection Date:	20-Aug-2021 19:36:27	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	11
Lab Sample ID:	ID IBLK	Lab Prep. Batch:	
Sample Info:	ID IBLK	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.711	1	605530	21	>100:1			1001.00	1007.33	98.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.711	1/0	10755	18	8.2:1			16.902	16.902		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	613134	16	>100:1			1001.00	986.85	97.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	195393	14	>100:1			1001.00	1035.02	100.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.141		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.478		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	106593	17	>100:1			5005.00	5134.01	100.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.407		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	626624	17	>100:1			1001.00	948.62	96.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.442		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	1	1210016	18	>100:1			5005.00	5123.20	99.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.558		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	576101	17	>100:1			1001.00	1074.88	100.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.818		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	146604	16				1001.00	1029.96	99.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.836		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.864	-1/-2	2370	13	3.2:1	Target = 3.55		2.3079	2.3079		
377 > 85	45	2.864	2.864		1924	23	5.8:1	1.23 (1.77-5.32)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.208		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.181	1	94785	20	>100:1			5005.00	5248.62	97.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.174		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.201	1	568810	21	>100:1			1001.00	1010.83	100.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.201		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	139967	18	>100:1			1001.00	974.91	93.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	1/0	1833	35	7.4:1	Target = 3.58	0.28	11.498	11.498		
499 > 99	54	3.585	3.585		239	10	4.5:1	7.66 (1.79-5.38)					
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.806	3.790	1/0	1715	22	6.4:1			3.2943	3.2943		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.920		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.237		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.398		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.755	4.742	1/0	575	13	12:1	Target = 2.99		5.7123	5.7123		
699 > 99	54	4.755	4.742		169	14		3.40 (1.49-4.49)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.593	3.585	1	653809	19	>100:1			1001.00	989.95	98.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.585		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.863	1	303634	18				1001.00	1011.12	97	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.863		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.928	1	114797	19	>100:1			5005.00	5448.91	103.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.937		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.535		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.945	3.937	1	629331	17	>100:1			1001.00	993.02	94.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.937		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	699078	18	>100:1			5005.00	5215.39	105.4	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.107		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.257	1	640208	15	>100:1			1001.00	952.98	93.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.257		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.257	4.257	1	670130	17	>100:1			5005.00	5551.92	105.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	1/0	2687	49		Target = 1.61	0.05	19.471	19.471		
584 > 526	60	4.277	4.267		1695	16	9.0:1	1.58 (0.80-2.42)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.297	4.287	1	99141	15	>100:1			1001.00	947.68	95.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.308		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.308	1	55066	18	>100:1			1001.00	990.28	114.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.318		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.463	4.454	1	117489	15	>100:1			1001.00	986.00	104.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.472		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.481	1	54124	16	>100:1			1001.00	1060.95	106.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.490	4.481	1/0	1480	13	16:1	Target = 1.01		23.768	23.768		
526 > 219	59	4.490	4.481		1636	11	11:1	0.90 (0.50-1.52)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.526	1	678444	17				1001.00	1003.46	98.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.526		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.775	4.769	1/0	3848	15	11:1	Target = 8.05		6.2634	6.2634		
663 > 169	38	4.775	4.769		1030	21	10.0:1	3.73 (4.02-12.07)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.992	1	921018	20	>100:1			1001.00	976.33	97.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	1/0	7641	22	11:1	Target = 11.30		10.071	10.071		
713 > 169	42	4.998	4.998		570	15	7.6:1	13.40 (5.65-16.95)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.390	1	946303	18	>100:1			1001.00	1025.04	101.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.399	5.390	1/0	13917	18	19:1	Target = 10.66		20.758	20.758		
813 > 269	40	5.399	5.390		1274	21	13:1	10.92 (5.33-16.00)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.789	5.775	1/0	12009	18	8.3:1	Target = 13.56		14.399	14.399		
913 > 319	40	5.789	5.775		1072	19	8.3:1	11.20 (6.78-20.35)					
*** 37 13C2_PFDA**													
515 > 470		3.945	3.937	1	761480	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.442	1	671165	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.201	3.201	1	609715	20	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	1	611765	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	143718	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021024.d
Injection Date: 20-Aug-2021 19:47:02 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC-1618 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	502.55	100.5	70 - 130
D 46 13C4_PFBA	612112	634452			103.6	50 - 150
D 50 13C5_PFPeA	629666	660499			104.9	50 - 150
21 PFPeA			500.00	486.47	97.3	70 - 130
7 PFBS			442.50	428.14	96.8	70 - 130
D 44 13C3_PFBS	193652	196489			101.5	50 - 150
1 4:2 FTS			467.50	460.18	98.4	70 - 130
D 63 13C2_4:2 FTS_2	105591	110830			105	50 - 150
D 49 13C5_PFHxA	649325	655078			100.9	50 - 150
15 PFHxA			500.00	530.58	106.1	70 - 130
22 PFPeS			470.00	494.51	105.2	70 - 130
28 GenX			2500.00	2248.93	90	70 - 130
D 66 13C3_GenX	1220862	1284433			105.2	50 - 150
D 47 13C4_PFHpA	573719	602229			105	50 - 150
13 PFHpA			500.00	432.58	86.5	70 - 130
D 45 13C3_PFHxS	146711	155165			105.8	50 - 150
14 PFHxS			456.00	446.64	97.9	70 - 130
29 ADONA			2355.00	2220.60	94.3	70 - 130
2 6:2 FTS			475.00	498.69	105	70 - 130
D 64 13C2_6:2 FTS_2	96908	93869			96.9	50 - 150
D 53 13C8_PFOA	563802	601347			106.7	50 - 150
20 PFOA			500.00	489.51	97.9	70 - 130
12 PFHpS			475.00	437.93	92.2	70 - 130
D 54 13C8_PFOS	149352	145974			97.7	50 - 150
18 PFOS			462.75	498.14	107.6	70 - 130
17 PFNA			500.00	500.46	100.1	70 - 130
D 56 13C9_PFNA	662557	683113			103.1	50 - 150
30 9Cl-PF3ONS			2330.00	2271.07	97.5	70 - 130
D 55 13C8_PFOSA	313093	328777			105	50 - 150
19 PFOSA			500.00	471.64	94.3	70 - 130
16 PFNS			480.00	505.89	105.4	70 - 130
D 65 13C2_8:2 FTS_2	110833	114992			103.8	50 - 150
10 PFDA			500.00	450.40	90.1	70 - 130
3 8:2 FTS			480.00	517.20	107.7	70 - 130
D 51 13C6_PFDA	663112	750001			113.1	50 - 150
D 58 d3-MeFOSAA	663389	763181			115	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	561.63	112.3	70 - 130
9 PFDS			482.50	503.84	104.4	70 - 130
25 PFUdA			500.00	566.91	113.4	70 - 130
D 60 d5-EtFOSAA	633381	684044			108	50 - 150
D 52 13C7_PFUdA	681974	713067			104.6	50 - 150
5 N-EtFOSAA			500.00	474.52	94.9	70 - 130
D 61 d7-MeFOSE	103682	114661			110.6	50 - 150
D 57 d3-MeFOSA	48151	60846			126.4	50 - 150
31 11Cl-PF3OUDS			2355.00	2317.96	98.4	70 - 130
D 62 d9-EtFOSE	112837	124421			110.3	50 - 150
D 59 d5-EtFOSA	50649	52801			104.2	50 - 150
11 PFDoA			500.00	489.55	97.9	70 - 130
D 38 13C2_PFDoA	687538	702316			102.1	50 - 150
4 10:2 FTS			2410.00	2279.84	94.6	70 - 130
24 PFTrDA			500.00	540.71	108.1	70 - 130
D 42 13C2_PFTeDA	948336	948443			100	50 - 150
23 PFTeDA			500.00	540.54	108.1	70 - 130
D 40 13C2_PFHxDA	930923	980938			105.4	50 - 150

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021024.d
Injection Date: 20-Aug-2021 19:47:02 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC-1618 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	634452	20	>100:1			1000.00	1055.44	103.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	335381	19	>100:1			500.00	502.55		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	660499	14	>100:1			1000.00	1063.08	104.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	0/-1	344869	17	>100:1			500.00	486.47		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	0	196489	14	>100:1			1000.00	1040.83	101.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	0/0	109594	17	>100:1	Target = 3.41		442.50	428.14		
298.9 > 99	44	2.141	2.141		30909	17	>100:1	3.54 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	0/0	83683	17	>100:1	Target = 2.92		470.00	494.51		
349 > 99	44	2.478	2.478		26660	15	>100:1	3.13 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	0	110830	18	>100:1			5000.00	5338.08	105	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	0/0	21634	18	>100:1	Target = 1.58		467.50	460.18		
327 > 81	63	2.407	2.407		12026	20	56:1	1.79 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	0	655078	17	>100:1			1000.00	991.69	100.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	0/0	352102	18	>100:1	Target = 18.69		500.00	530.58		
313 > 119	49	2.451	2.442		18233	13	>100:1	19.31 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1284433	17	>100:1			5000.00	5438.28	105.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	0/0	394962	17	>100:1	Target = 0.78		2500.00	2248.93		
285 > 185	66	2.567	2.558		529891	16	>100:1	0.74 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	602229	18	>100:1			1000.00	1123.63	105	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	290930	17	>100:1	Target = 3.75		500.00	432.58		
363 > 169	47	2.818	2.818		81700	16	>100:1	3.56 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	155165	17	>100:1			1000.00	1090.10	105.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	0/0	76134	24	>100:1	Target = 2.79	0.14	456.00	446.64		
399 > 99	45	2.836	2.836		24405	24	>100:1	3.11 (1.39-4.19)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.864	0/0	2415936	18	>100:1	Target = 3.21		2355.00	2220.60		
377 > 85	45	2.854	2.864		732763	18	>100:1	3.29 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.207	3.208	0/0	71520	21	>100:1	Target = 3.03		475.00	437.93		
449 > 99	45	3.214	3.208		23409	20	>100:1	3.05 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.174	3.181	0	93869	19	>100:1			5000.00	5197.90	96.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.174	1/1	23614	21	>100:1	Target = 1.94		475.00	498.69		
427 > 81	64	3.181	3.174		11320	21	76:1	2.08 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.201	3.201	0	601347	21	>100:1			1000.00	1068.65	106.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.207	3.201	1/1	293729	19	>100:1	Target = 2.91		500.00	489.51		
413 > 169	53	3.207	3.201		109657	19	>100:1	2.67 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	145974	19	>100:1			1000.00	1016.75	97.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	1/0	82903	37	>100:1	Target = 3.38	0.22	462.75	498.14		
499 > 99	54	3.585	3.585		23464	34	>100:1	3.53 (1.69-5.07)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.799	3.790	1/0	1234303	19	>100:1			2330.00	2271.07		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.929	3.920	1/0	62418	19	>100:1	Target = 2.80		480.00	505.89		
549 > 99	54	3.937	3.920		23528	15	>100:1	2.65 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.237	1/0	60550	15	>100:1	Target = 3.15		482.50	503.84		
599 > 99	54	4.237	4.237		18624	14		3.25 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.398	4.398	1/0	1091146	17	>100:1			2355.00	2317.96		
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.585	1	683113	19	>100:1			1000.00	1034.32	103.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.593	3.585	1/0	365723	20	>100:1	Target = 6.48		500.00	500.46		
463 > 169	56	3.585	3.585		55161	19	>100:1	6.63 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.863	1	328777	17	>100:1			1000.00	1094.85	105	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.871	3.863	1/0	161971	17	>100:1	Target = 32.22		500.00	471.64		
498>478	55	3.871	3.863		4071	22	38:1	39.78 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.928	1	114992	18	>100:1			5000.00	5458.17	103.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.937	1/0	26412	16	>100:1	Target = 1.96		480.00	517.20		
527 > 81	65	3.937	3.937		14098	22		1.87 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.544	4.535	1/0	154538	17	>100:1	Target = 3.34		2410.00	2279.84		
627 > 80	65	4.544	4.535		47488	16	>100:1	3.25 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.937	3.937	1	750001	18	>100:1			1000.00	1183.42	113.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.946	3.937	1/0	373978	18	>100:1	Target = 13.93		500.00	450.40		
513 > 169	51	3.937	3.937		29893	17	>100:1	12.51 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	763181	19	>100:1			5000.00	5693.63	115	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	1/0	69091	17	>100:1	Target = 1.31		500.00	561.63		
570 > 483	58	4.107	4.107		42671	18	>100:1	1.61 (0.65-1.97)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.257	1	713067	16	>100:1			1000.00	1061.43	104.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.257	4.257	1/0	364865	16	>100:1	Target = 14.01		500.00	566.91		
563 > 169	52	4.257	4.257		19630	12	98:1	18.58 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.257	4.257	1	684044	16	>100:1			5000.00	5667.19	108	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.268	4.267	1/0	66911	16		Target = 1.75		500.00	474.52		
584 > 526	60	4.268	4.267		41604	14	>100:1	1.60 (0.87-2.62)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.287	1	114661	13	>100:1			1000.00	1096.04	110.6	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.308	1	60846	13	>100:1			1000.00	1094.23	126.4	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.464	4.454	1	124421	16	>100:1			1000.00	1044.17	110.3	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.482	4.481	1	52801	16	>100:1			1000.00	1035.02	104.2	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.536	4.526	1	702316	16	>100:1			1000.00	1038.76	102.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.536	4.526	1/0	365208	16	>100:1	Target = 10.52		500.00	489.55		
613 > 169	38	4.536	4.526		34902	22	>100:1	10.46 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.775	4.769	1/0	344228	21	>100:1	Target = 7.51		500.00	540.71		
663 > 169	38	4.775	4.769		43594	28	>100:1	7.89 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.992	1	948443	19	>100:1			1000.00	1005.40	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	0/-1	422726	21	82:1	Target = 11.12		500.00	540.54		
713 > 169	42	4.998	4.998		37555	19	>100:1	11.25 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.398	5.390	1	980938	19	>100:1			1000.00	1062.56	105.4	
*** 37 13C2_PFDA**													
515 > 470		3.946	3.937	1	787518	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	678631	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.207	3.201	1	611364	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	627595	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	158151	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A02.d
Injection Date: 13-Aug-2021 16:53:59 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 94
Sample Info: ID CCV 100A_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	101.93	101.9	70 - 130
D 46 13C4_PFBA	574801	545149			94.8	50 - 150
D 50 13C5_PFPeA	538043	512785			95.3	50 - 150
21 PFPeA			100.00	96.305	96.3	70 - 130
7 PFBS			88.400	96.941	109.7	70 - 130
D 44 13C3_PFBS	187099	165513			88.5	50 - 150
1 4:2 FTS			93.400	79.585	85.2	70 - 130
D 63 13C2_4:2 FTS_2	103169	99301			96.3	50 - 150
D 49 13C5_PFHxA	593317	593069			100	50 - 150
15 PFHxA			100.00	95.258	95.3	70 - 130
22 PFPeS			93.800	107.36	114.5	70 - 130
28 GenX			200.00	240.05	120	70 - 130
D 66 13C3_GenX	1107213	1148403			103.7	50 - 150
D 47 13C4_PFHpA	479053	470133			98.1	50 - 150
13 PFHpA			100.00	104.83	104.8	70 - 130
D 45 13C3_PFHxS	139557	127100			91.1	50 - 150
14 PFHxS			91.000	97.810	107.5	70 - 130
29 ADONA			94.200	99.710	105.8	70 - 130
D 64 13C2_6:2 FTS_2	86994	89414			102.8	50 - 150
2 6:2 FTS			94.800	113.68	119.9	70 - 130
D 53 13C8_PFOA	486725	458188			94.1	50 - 150
20 PFOA			100.00	114.67	114.7	70 - 130
12 PFHpS			95.200	110.18	115.7	70 - 130
18 PFOS			92.800	94.791	102.1	70 - 130
D 54 13C8_PFOS	130612	138084			105.7	50 - 150
17 PFNA			100.00	104.12	104.1	70 - 130
D 56 13C9_PFNA	580651	607872			104.7	50 - 150
30 9Cl-PF3ONS			93.200	78.006	83.7	70 - 130
D 55 13C8_PFOSA	268160	268873			100.3	50 - 150
19 PFOSA			100.00	88.338	88.3	70 - 130
16 PFNS			96.000	89.554	93.3	70 - 130
D 65 13C2_8:2 FTS_2	97398	103831			106.6	50 - 150
3 8:2 FTS			95.800	83.922	87.6	70 - 130
10 PFDA			100.00	90.975	91	70 - 130
D 51 13C6_PFDA	542953	559431			103	50 - 150
6 N-MeFOSAA			100.00	90.649	90.6	70 - 130

Report Date: 15-Aug-2021 10:20:50 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A02.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	728447			122.1	50 - 150
9 PFDS			96.400	87.781	91.1	70 - 130
D 60 d5-EtFOSAA	592804	606019			102.2	50 - 150
D 52 13C7_PFUdA	631526	617097			97.7	50 - 150
5 N-EtFOSAA			100.00	87.112	87.1	70 - 130
25 PFUdA			100.00	101.02	101	70 - 130
D 61 d7-MeFOSE	89085	86996			97.7	50 - 150
32 MeFOSE			100.00	78.093	78.1	70 - 130
D 57 d3-MeFOSA	50589	49557			98	50 - 150
26 MeFOSA			100.00	91.703	91.7	70 - 130
31 11Cl-PF3OUDS			94.200	83.202	88.3	70 - 130
D 62 d9-EtFOSE	90529	85575			94.5	50 - 150
33 EtFOSE			100.00	94.424	94.4	70 - 130
D 59 d5-EtFOSA	43442	45385			104.5	50 - 150
27 EtFOSA			100.00	94.484	94.5	70 - 130
11 PFDoA			100.00	98.700	98.7	70 - 130
D 38 13C2_PFDoA	595792	589341			98.9	50 - 150
4 10:2 FTS			96.400	103.32	107.2	70 - 130
34 PFDOS			96.800	94.420	97.5	70 - 130
24 PFTrDA			100.00	104.72	104.7	70 - 130
23 PFTeDA			100.00	106.20	106.2	70 - 130
D 42 13C2_PFTeDA	902749	756606			83.8	50 - 150
35 PFHxDA			100.00	106.11	106.1	70 - 130
D 40 13C2_PFHxDA	845704	781901			92.5	50 - 150
36 PFODA			100.00	100.01	100	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A02.d
Injection Date: 13-Aug-2021 16:53:59 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 94
Sample Info: ID CCV 100A_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.724	1.724	2	545149	20	>100:1			1000.00	981.49	94.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.731	1.731	2/0	55536	19	45:1			100.00	101.93		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.120	2.120	4	512785	17	>100:1			1000.00	985.11	95.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.120	2.120	4/0	53845	16	65:1			100.00	96.305		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.172	2.172	3	165513	16	>100:1			1000.00	922.60	88.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.172	2.172	3/0	19130	17	>100:1	Target = 3.26		88.400	96.941		
298.9 > 99	44	2.172	2.172		5709	14	64:1	3.35 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.523	2.523	4/1	15945	17	>100:1	Target = 3.15		93.800	107.36		
349 > 99	44	2.523	2.523		5462	22		2.91 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.451	2.451	4	99301	17	>100:1			5000.00	4969.92	96.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.451	2.451	4/0	3404	13	29:1	Target = 1.68		93.400	79.585		
327 > 81	63	2.442	2.451		2854	17	11:1	1.19 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.487	2.487	4	593069	18	>100:1			1000.00	1013.97	100	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.487	2.487	4/0	59032	18	96:1	Target = 18.18		100.00	95.258		
313 > 119	49	2.496	2.487		2789	12	25:1	21.16 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.614	2.614	4	1148403	19	>100:1			5000.00	5333.54	103.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.614	2.614	4/0	38500	18	36:1	Target = 0.79		200.00	240.05		
285 > 185	66	2.599	2.614		52354	18	56:1	0.73 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.873	2.873	5	470133	18	>100:1			1000.00	971.89	98.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.873	2.873	5/0	55054	17	92:1	Target = 3.65		100.00	104.83		
363 > 169	47	2.880	2.873		13582	23	59:1	4.05 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.888	2.888	5	127100	16				1000.00	946.56	91.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.888	2.888	5/0	13617	26	>100:1	Target = 3.10	0.11	91.000	97.810		
399 > 99	45	2.880	2.888		4100	25	32:1	3.32 (1.55-4.66)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.912	2.912	5/0	83497	19	>100:1	Target = 3.01		94.200	99.710		
377 > 85	45	2.912	2.912		28350	25	>100:1	2.94 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.276	3.276	6/1	13325	20	>100:1	Target = 2.85		95.200	110.18		
449 > 99	45	3.276	3.276		4455	17	44:1	2.99 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.241	3.241	6	89414	22	>100:1			5000.00	5541.51	102.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.241	3.241	5/-1	4942	21		Target = 1.74		94.800	113.68		
427 > 81	64	3.248	3.241		2031	19	15:1	2.43 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.269	3.269	6	458188	22	>100:1			1000.00	983.65	94.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.262	3.262	6/0	52297	27	38:1	Target = 2.92		100.00	114.67		
413 > 169	53	3.269	3.262		14063	16	77:1	3.71 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.651	3.651	7	138084	21				1000.00	1037.98	105.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.651	3.651	7/0	14836	42	87:1	Target = 3.34	0.22	92.800	94.791		
499 > 99	54	3.651	3.651		3870	30	42:1	3.83 (1.67-5.02)	0.13				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.854	3.854	6/-1	40851	18	>100:1			93.200	78.006		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	4.005	4.005	7/0	10120	19	65:1	Target = 2.63		96.000	89.554		
549 > 99	54	3.995	4.005		5054	18	21:1	2.00 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.297	4.297	6/-1	10019	17	57:1	Target = 2.65		96.400	87.781		
599 > 99	54	4.308	4.297		4121	23	40:1	2.43 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.472	4.472	7/0	38217	17	>100:1			94.200	83.202		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.826	4.826	7/0	9760	23	>100:1	Target = 3.08		96.800	94.420		
699 > 99	54	4.817	4.826		3941	15	78:1	2.47 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.657	3.657	6	607872	23	>100:1			1000.00	1066.95	104.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.657	3.657	6/0	69610	23	>100:1	Target = 6.55		100.00	104.12		
463 > 169	56	3.662	3.657		9503	26	51:1	7.32 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.904	3.904	4	268873	17	>100:1			1000.00	985.21	100.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.895	3.895	4/0	26609	18	>100:1	Target = 33.36		100.00	88.338		
498>478	55	3.904	3.895		843	14		31.56 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		4.005	4.005	7	103831	21				5000.00	5434.41	106.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.995	3.995	6/-1	3903	14	15:1	Target = 2.44		95.800	83.922		
527 > 81	65	4.016	3.995		2215	18	9.4:1	1.76 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.619	4.619	7/0	5538	20	47:1	Target = 3.72		96.400	103.32		
627 > 80	65	4.603	4.619		1409	21	19:1	3.93 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		4.016	4.016	7	559431	16	>100:1			1000.00	1024.90	103	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	4.016	4.016	7/0	59144	16	63:1	Target = 13.09		100.00	90.975		
513 > 169	51	4.005	4.016		5526	21	35:1	10.70 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.169	4.169	7	728447	17	>100:1			5000.00	5823.16	122.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.169	4.169	6/-1	10815	26	97:1	Target = 1.36	0.13	100.00	90.649		
570 > 483	58	4.178	4.169		8674	22	20:1	1.24 (0.68-2.04)	0.11				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.328	4.328	6	617097	16	>100:1			1000.00	1041.45	97.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.328	4.328	7/1	59014	16	>100:1	Target = 14.48		100.00	101.02		
563 > 169	52	4.328	4.328		5217	21	33:1	11.31 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.328	4.328	6	606019	16	>100:1			5000.00	5449.33	102.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.338	4.338	7/1	11076	25	39:1	Target = 1.63	0.13	100.00	87.112		
584 > 526	60	4.338	4.338		7917	34	33:1	1.39 (0.81-2.44)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.308	4.308	2	86996	16	>100:1			1000.00	1043.81	97.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.328	3/1	7654	13	32:1			100.00	78.093		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.328	4.328	3	49557	13	86:1			1000.00	983.17	98	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.347	4.347	3/0	4812	11	44:1	Target = 1.09		100.00	91.703		
512 > 219	57	4.338	4.347		4444	18	20:1	1.08 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.472	4.472	2	85575	17	>100:1			1000.00	914.60	94.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.490	4.490	3/1	7719	23	37:1			100.00	94.424		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.499	4.499	3	45385	14	>100:1			1000.00	1026.36	104.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.508	4.508	3/0	4843	21	24:1	Target = 1.02		100.00	94.484		
526 > 219	59	4.508	4.508		4851	21	70:1	0.99 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.611	4.611	7	589341	18	>100:1			1000.00	1010.39	98.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.611	4.611	7/0	61557	16	14:1	Target = 10.77		100.00	98.700		
613 > 169	38	4.611	4.611		5825	22	48:1	10.56 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.859	4.859	7/0	58155	16	>100:1	Target = 8.06		100.00	104.72		
663 > 169	38	4.859	4.859		7588	16	54:1	7.66 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.087	5.087	8	756606	22	>100:1			1000.00	845.82	83.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.087	5.087	7/-1	64603	21	80:1	Target = 11.68		100.00	106.20		
713 > 169	42	5.087	5.087		5705	15	64:1	11.32 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.516	5.516	10	781901	22	>100:1			1000.00	935.22	92.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.516	5.516	9/-1	57590	19	13:1	Target = 10.53		100.00	106.11		
813 > 269	40	5.516	5.516		5992	20	39:1	9.61 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.947	5.947	0/-10	67564	41	9.4:1	Target = 13.30		100.00	100.01		M
913 > 319	40	5.947	5.947		5211	40	66:1	12.96 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		4.016	4.016	7	627863	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.496	2.496	4	602835	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.269	3.269	6	492293	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.731	1.731	2	521925	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.651	3.651	7	135761	23	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A03.d
Injection Date: 13-Aug-2021 17:04:32 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 200A_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	204.33	102.2	70 - 130
D 46 13C4_PFBA	545149	549533			100.8	50 - 150
D 50 13C5_PFPeA	512785	510448			99.5	50 - 150
21 PFPeA			200.00	201.52	100.8	70 - 130
7 PFBS			176.80	179.10	101.3	70 - 130
D 44 13C3_PFBS	165513	176820			106.8	50 - 150
1 4:2 FTS			186.80	166.08	88.9	70 - 130
D 63 13C2_4:2 FTS_2	99301	97939			98.6	50 - 150
D 49 13C5_PFHxA	593069	582802			98.3	50 - 150
15 PFHxA			200.00	196.88	98.4	70 - 130
22 PFPeS			187.60	171.37	91.3	70 - 130
28 GenX			400.00	393.84	98.5	70 - 130
D 66 13C3_GenX	1148403	1144739			99.7	50 - 150
D 47 13C4_PFHpA	470133	464670			98.8	50 - 150
13 PFHpA			200.00	203.90	101.9	70 - 130
D 45 13C3_PFHxS	127100	127842			100.6	50 - 150
14 PFHxS			182.00	179.60	98.7	70 - 130
29 ADONA			188.40	193.79	102.9	70 - 130
D 64 13C2_6:2 FTS_2	89414	84576			94.6	50 - 150
2 6:2 FTS			189.60	206.49	108.9	70 - 130
D 53 13C8_PFOA	458188	457993			100	50 - 150
20 PFOA			200.00	202.06	101	70 - 130
12 PFHpS			190.40	226.12	118.8	70 - 130
18 PFOS			185.60	209.44	112.8	70 - 130
D 54 13C8_PFOS	138084	120688			87.4	50 - 150
17 PFNA			200.00	200.47	100.2	70 - 130
D 56 13C9_PFNA	607872	561022			92.3	50 - 150
30 9Cl-PF3ONS			186.40	195.06	104.6	70 - 130
D 55 13C8_PFOSA	268873	256515			95.4	50 - 150
19 PFOSA			200.00	205.91	103	70 - 130
16 PFNS			192.00	203.28	105.9	70 - 130
D 65 13C2_8:2 FTS_2	103831	83593			80.5	50 - 150
3 8:2 FTS			191.60	256.04	133.6	70 - 130
10 PFDA			200.00	201.02	100.5	70 - 130
D 51 13C6_PFDA	559431	504164			90.1	50 - 150
6 N-MeFOSAA			200.00	189.39	94.7	70 - 130

Report Date: 15-Aug-2021 10:20:51 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A03.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	728447	669120			91.9	50 - 150
9 PFDS			192.80	181.33	94.1	70 - 130
D 60 d5-EtFOSAA	606019	561244			92.6	50 - 150
D 52 13C7_PFUdA	617097	568307			92.1	50 - 150
5 N-EtFOSAA			200.00	209.09	104.5	70 - 130
25 PFUdA			200.00	202.87	101.4	70 - 130
D 61 d7-MeFOSE	86996	84989			97.7	50 - 150
32 MeFOSE			200.00	184.32	92.2	70 - 130
D 57 d3-MeFOSA	49557	39641			80	50 - 150
26 MeFOSA			200.00	249.44	124.7	70 - 130
31 11Cl-PF3OUDS			188.40	191.88	101.8	70 - 130
D 62 d9-EtFOSE	85575	93135			108.8	50 - 150
33 EtFOSE			200.00	180.98	90.5	70 - 130
D 59 d5-EtFOSA	45385	43940			96.8	50 - 150
27 EtFOSA			200.00	176.20	88.1	70 - 130
11 PFDoA			200.00	205.21	102.6	70 - 130
D 38 13C2_PFDoA	589341	562352			95.4	50 - 150
4 10:2 FTS			192.80	212.93	110.4	70 - 130
34 PFDOS			193.60	215.63	111.4	70 - 130
24 PFTrDA			200.00	220.65	110.3	70 - 130
23 PFTeDA			200.00	206.62	103.3	70 - 130
D 42 13C2_PFTeDA	756606	762835			100.8	50 - 150
35 PFHxDA			200.00	206.01	103	70 - 130
D 40 13C2_PFHxDA	781901	824084			105.4	50 - 150
36 PFODA			200.00	187.38	93.7	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A03.d
Injection Date: 13-Aug-2021 17:04:32 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 200A_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.724	1.724	1	549533	21	>100:1			1000.00	989.39	100.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.724	1.731	0/-1	112221	20	99:1			200.00	204.33		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.109	2.120	0	510448	16	>100:1			1000.00	980.62	99.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.109	2.120	0/0	112159	14	>100:1			200.00	201.52		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.162	2.172	0	176820	15	>100:1			1000.00	985.63	106.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.162	2.172	0/0	37757	19	>100:1	Target = 3.26		176.80	179.10		
298.9 > 99	44	2.162	2.172		10455	13	81:1	3.61 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.514	2.523	0/0	27191	16	>100:1	Target = 3.15		187.60	171.37		
349 > 99	44	2.514	2.523		9414	17	66:1	2.88 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.442	2.451	0	97939	18	>100:1			5000.00	4901.75	98.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.442	2.451	0/0	7006	21	>100:1	Target = 1.68		186.80	166.08		
327 > 81	63	2.442	2.451		6840	18	38:1	1.02 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.478	2.487	0	582802	18	>100:1			1000.00	996.41	98.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.478	2.487	0/0	119896	16	>100:1	Target = 18.18		200.00	196.88		
313 > 119	49	2.478	2.487		6539	20	55:1	18.33 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.599	2.614	0	1144739	19	>100:1			5000.00	5316.52	99.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.599	2.614	0/0	62965	19	>100:1	Target = 0.79		400.00	393.84		
285 > 185	66	2.599	2.614		84302	19	83:1	0.74 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.864	2.873	0	464670	17	>100:1			1000.00	960.60	98.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.864	2.873	0/0	105837	18	>100:1	Target = 3.65		200.00	203.90		
363 > 169	47	2.864	2.873		30595	17	>100:1	3.45 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.873	2.888	0	127842	19	>100:1			1000.00	952.09	100.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.881	2.888	0/0	25149	31	86:1	Target = 3.10	0.24	182.00	179.60		
399 > 99	45	2.873	2.888		8095	33	51:1	3.10 (1.55-4.66)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.896	2.912	0/0	163223	20	>100:1	Target = 3.01		188.40	193.79		
377 > 85	45	2.904	2.912		56564	19	>100:1	2.88 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.255	3.276	-1/-1	27506	22	>100:1	Target = 2.85		190.40	226.12		
449 > 99	45	3.255	3.276		5898	14	31:1	4.66 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.228	3.241	0	84576	21	>100:1			5000.00	5241.68	94.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.234	3.241	0/0	8491	18	>100:1	Target = 1.74		189.60	206.49		
427 > 81	64	3.221	3.241		4126	22	34:1	2.05 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.255	3.269	0	457993	22	>100:1			1000.00	983.23	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.255	3.262	0/0	92111	19	89:1	Target = 2.92		200.00	202.06		
413 > 169	53	3.248	3.262		31514	23	>100:1	2.92 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.632	3.651	-1	120688	21	>100:1			1000.00	907.21	87.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.639	3.651	0/1	28650	34	>100:1	Target = 3.34	0.21	185.60	209.44		
499 > 99	54	3.632	3.651		8204	32	54:1	3.49 (1.67-5.02)	0.03				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.847	3.854	0/1	89280	17	>100:1			186.40	195.06		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.985	4.005	-1/0	20078	14	>100:1	Target = 2.63		192.00	203.28		
549 > 99	54	3.985	4.005		6992	21	28:1	2.87 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.288	4.297	0/1	18089	19	>100:1	Target = 2.65		192.80	181.33		
599 > 99	54	4.298	4.297		7610	20		2.37 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.455	4.472	-1/0	77031	15	>100:1			188.40	191.88		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.806	4.826	-1/0	19481	19	>100:1	Target = 3.08		193.60	215.63		
699 > 99	54	4.806	4.826		5941	15	>100:1	3.27 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.639	3.657	-1	561022	21	>100:1			1000.00	984.71	92.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.646	3.657	0/1	123699	25	>100:1	Target = 6.55		200.00	200.47		
463 > 169	56	3.639	3.657		19141	21	90:1	6.46 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.896	3.904	0	256515	17	>100:1			1000.00	939.93	95.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.896	3.895	1/1	59174	18	>100:1	Target = 33.36		200.00	205.91		
498>478	55	3.896	3.895		1551	15	19:1	38.15 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.985	4.005	-1	83593	16				5000.00	4375.18	80.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.985	3.995	0/1	9587	15	35:1	Target = 2.44		191.60	256.04		
527 > 81	65	3.995	3.995		4238	22		2.26 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.603	4.619	0/1	9189	21		Target = 3.72		192.80	212.93		
627 > 80	65	4.595	4.619		2944	19	11:1	3.12 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.995	4.016	-1	504164	16	>100:1			1000.00	923.65	90.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.995	4.016	-1/0	117778	15	>100:1	Target = 13.09		200.00	201.02		
513 > 169	51	3.995	4.016		8152	23	28:1	14.44 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.152	4.169	-1	669120	19	>100:1			5000.00	5348.90	91.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.160	4.169	0/1	20755	27	>100:1	Target = 1.36	0.12	200.00	189.39		
570 > 483	58	4.160	4.169		17613	30	89:1	1.17 (0.68-2.04)	0.18				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.308	4.328	-1	568307	17	>100:1			1000.00	959.11	92.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.308	4.328	-1/0	109144	15	>100:1	Target = 14.48		200.00	202.87		
563 > 169	52	4.318	4.328		8206	14	59:1	13.30 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.318	4.328	0	561244	16	>100:1			5000.00	5046.71	92.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.328	4.338	0/0	24621	32		Target = 1.63		200.00	209.09		M
584 > 526	60	4.318	4.338		13749	26		1.79 (0.81-2.44)	0.19				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.308	4.308	1	84989	15	>100:1			1000.00	1019.73	97.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.318	4.328	0/-1	17649	13	73:1			200.00	184.32		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.328	4.328	1	39641	22	>100:1			1000.00	786.45	80	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.338	4.347	0/-1	10470	13	24:1	Target = 1.09		200.00	249.44		
512 > 219	57	4.328	4.347		7949	18	43:1	1.31 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.473	4.472	1	93135	16	>100:1			1000.00	995.39	108.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.491	4.490	1/0	16102	14	>100:1			200.00	180.98		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.500	4.499	1	43940	22	>100:1			1000.00	993.68	96.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.509	4.508	1/0	8744	14	67:1	Target = 1.02		200.00	176.20		
526 > 219	59	4.500	4.508		9945	18	84:1	0.87 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.595	4.611	0	562352	18	>100:1			1000.00	964.12	95.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.595	4.611	0/0	122126	18	21:1	Target = 10.77		200.00	205.21		
613 > 169	38	4.586	4.611		11578	26	46:1	10.54 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.843	4.859	0/0	116926	20	>100:1	Target = 8.06		200.00	220.65		
663 > 169	38	4.843	4.859		12974	17	>100:1	9.01 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.069	5.087	-1	762835	22	>100:1			1000.00	852.78	100.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.069	5.087	-1/0	126720	22	31:1	Target = 11.68		200.00	206.62		
713 > 169	42	5.063	5.087		11384	22	>100:1	11.13 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.488	5.516	-1	824084	22	>100:1			1000.00	985.68	105.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.488	5.516	-1/0	117846	21	24:1	Target = 10.53		200.00	206.01		
813 > 269	40	5.488	5.516		11262	20	>100:1	10.46 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.914	5.947	-1/0	133415	34	15:1	Target = 13.30		200.00	187.38		
913 > 319	40	5.910	5.947		10386	39	>100:1	12.84 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.995	4.016	-1	571927	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.478	2.496	-1	565035	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.255	3.269	0	479801	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.724	1.731	0	504403	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.632	3.651	-1	130776	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A16.d
Injection Date: 13-Aug-2021 19:17:52 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 11
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1020.46	102	70 - 130
D 46 13C4_PFBA	545149	578940			106.2	50 - 150
D 50 13C5_PFPeA	512785	558672			108.9	50 - 150
21 PFPeA			1000.00	1015.12	101.5	70 - 130
7 PFBS			884.00	933.70	105.6	70 - 130
D 44 13C3_PFBS	165513	181002			109.4	50 - 150
1 4:2 FTS			934.00	923.42	98.9	70 - 130
D 63 13C2_4:2 FTS_2	99301	108675			109.4	50 - 150
D 49 13C5_PFHxA	593069	646708			109	50 - 150
15 PFHxA			1000.00	935.77	93.6	70 - 130
22 PFPeS			938.00	963.15	102.7	70 - 130
28 GenX			2000.00	1907.12	95.4	70 - 130
D 66 13C3_GenX	1148403	1179657			102.7	50 - 150
D 47 13C4_PFHpA	470133	507135			107.9	50 - 150
13 PFHpA			1000.00	1024.63	102.5	70 - 130
D 45 13C3_PFHxS	127100	148837			117.1	50 - 150
14 PFHxS			910.00	880.79	96.8	70 - 130
29 ADONA			942.00	850.01	90.2	70 - 130
D 64 13C2_6:2 FTS_2	89414	91431			102.3	50 - 150
2 6:2 FTS			948.00	1055.13	111.3	70 - 130
D 53 13C8_PFOA	458188	494660			108	50 - 150
20 PFOA			1000.00	1055.85	105.6	70 - 130
12 PFHpS			952.00	971.22	102	70 - 130
18 PFOS			928.00	886.47	95.5	70 - 130
D 54 13C8_PFOS	138084	142483			103.2	50 - 150
17 PFNA			1000.00	992.24	99.2	70 - 130
D 56 13C9_PFNA	607872	603472			99.3	50 - 150
30 9Cl-PF3ONS			932.00	874.51	93.8	70 - 130
D 55 13C8_PFOSA	268873	297456			110.6	50 - 150
19 PFOSA			1000.00	982.03	98.2	70 - 130
16 PFNS			960.00	1051.13	109.5	70 - 130
D 65 13C2_8:2 FTS_2	103831	100466			96.8	50 - 150
3 8:2 FTS			958.00	1030.43	107.6	70 - 130
10 PFDA			1000.00	1044.74	104.5	70 - 130
D 51 13C6_PFDA	559431	570822			102	50 - 150
6 N-MeFOSAA			1000.00	976.80	97.7	70 - 130

Report Date: 15-Aug-2021 10:20:57 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A16.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	728447	746407			102.5	50 - 150
9 PFDS			964.00	906.27	94	70 - 130
D 60 d5-EtFOSAA	606019	616579			101.7	50 - 150
D 52 13C7_PFUdA	617097	628594			101.9	50 - 150
5 N-EtFOSAA			1000.00	1027.75	102.8	70 - 130
25 PFUdA			1000.00	988.43	98.8	70 - 130
D 61 d7-MeFOSE	86996	98072			112.7	50 - 150
32 MeFOSE			1000.00	815.58	81.6	70 - 130
D 57 d3-MeFOSA	49557	56695			114.4	50 - 150
26 MeFOSA			1000.00	897.16	89.7	70 - 130
31 11Cl-PF3OUDS			942.00	956.54	101.5	70 - 130
D 62 d9-EtFOSE	85575	106437			124.4	50 - 150
33 EtFOSE			1000.00	949.92	95	70 - 130
D 59 d5-EtFOSA	45385	52682			116.1	50 - 150
27 EtFOSA			1000.00	903.67	90.4	70 - 130
11 PFDoA			1000.00	1030.10	103	70 - 130
D 38 13C2_PFDoA	589341	572611			97.2	50 - 150
4 10:2 FTS			964.00	976.08	101.3	70 - 130
34 PFDOS			968.00	969.75	100.2	70 - 130
24 PFTrDA			1000.00	1120.03	112	70 - 130
23 PFTeDA			1000.00	1047.13	104.7	70 - 130
D 42 13C2_PFTeDA	756606	902518			119.3	50 - 150
35 PFHxDA			1000.00	970.60	97.1	70 - 130
D 40 13C2_PFHxDA	781901	918492			117.5	50 - 150
36 PFODA			1000.00	992.70	99.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A16.d
Injection Date: 13-Aug-2021 19:17:52 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 11
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.724	0	578940	20	>100:1			1000.00	1042.33	106.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.731	0/0	590447	20	>100:1			1000.00	1020.46		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.098	2.120	-1	558672	15	>100:1			1000.00	1073.27	108.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.120	-1/0	618351	15	>100:1			1000.00	1015.12		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.172	-1	181002	14	>100:1			1000.00	1008.94	109.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.162	2.172	0/1	201496	15	>100:1	Target = 3.26		884.00	933.70		
298.9 > 99	44	2.162	2.172		57610	15	>100:1	3.49 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.505	2.523	-1/0	156437	19	>100:1	Target = 3.15		938.00	963.15		
349 > 99	44	2.505	2.523		52155	17	>100:1	2.99 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.424	2.451	-1	108675	18	>100:1			5000.00	5439.08	109.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.433	2.451	-1/0	43225	18	>100:1	Target = 1.68		934.00	923.42		
327 > 81	63	2.433	2.451		23367	19	>100:1	1.84 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.469	2.487	-1	646708	18	>100:1			1000.00	1105.67	109	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.469	2.487	-1/0	632349	18	>100:1	Target = 18.18		1000.00	935.77		
313 > 119	49	2.469	2.487		32895	16	>100:1	19.22 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.583	2.614	-1	1179657	19	>100:1			5000.00	5478.69	102.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.583	2.614	-1/0	314198	19	>100:1	Target = 0.79		2000.00	1907.12		
285 > 185	66	2.583	2.614		403658	19	>100:1	0.77 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.845	2.873	-1	507135	17	>100:1			1000.00	1048.38	107.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.845	2.873	-1/0	580462	18	>100:1	Target = 3.65		1000.00	1024.63		
363 > 169	47	2.845	2.873		155483	18	>100:1	3.73 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.864	2.888	-1	148837	17	>100:1			1000.00	1108.45	117.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.864	2.888	-1/0	143594	26	>100:1	Target = 3.10	0.16	910.00	880.79		
399 > 99	45	2.854	2.888		50290	24	>100:1	2.85 (1.55-4.66)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.880	2.912	-1/0	833533	19	>100:1	Target = 3.01		942.00	850.01		
377 > 85	45	2.880	2.912		296517	19	>100:1	2.81 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.234	3.276	-2/-1	137545	20	>100:1	Target = 2.85		952.00	971.22		
449 > 99	45	3.234	3.276		46810	23	>100:1	2.93 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.201	3.241	-2	91431	21	>100:1			5000.00	5666.52	102.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.208	3.241	-2/0	46904	20	>100:1	Target = 1.74		948.00	1055.13		
427 > 81	64	3.208	3.241		25406	20	>100:1	1.84 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.228	3.269	-2	494660	21	>100:1			1000.00	1061.95	108	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.234	3.262	-1/1	519842	20	>100:1	Target = 2.92		1000.00	1055.85		
413 > 169	53	3.228	3.262		171175	20	>100:1	3.03 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.609	3.651	-2	142483	18	>100:1			1000.00	1071.04	103.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.609	3.651	-2/0	143164	33	>100:1	Target = 3.34	0.27	928.00	886.47		M
499 > 99	54	3.609	3.651		42846	35	>100:1	3.34 (1.67-5.02)	0.12				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.822	3.854	-1/1	472560	18	>100:1			932.00	874.51		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.954	4.005	-3/-1	122566	16	>100:1	Target = 2.63		960.00	1051.13		
549 > 99	54	3.954	4.005		41939	14	>100:1	2.92 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.267	4.297	-1/1	106733	15	>100:1	Target = 2.65		964.00	906.27		
599 > 99	54	4.267	4.297		46048	17	>100:1	2.31 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.420	4.472	-3/-1	453360	19	>100:1			942.00	956.54		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.775	4.826	-3/-1	103434	20		Target = 3.08		968.00	969.75		
699 > 99	54	4.775	4.826		35811	27		2.88 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.617	3.657	-2	603472	20	>100:1			1000.00	1059.22	99.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.617	3.657	-2/0	658592	19	>100:1	Target = 6.55		1000.00	992.24		
463 > 169	56	3.617	3.657		99318	19	>100:1	6.63 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.895	3.904	0	297456	19	>100:1			1000.00	1089.95	110.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.895	3.895	1/1	327252	18	>100:1	Target = 33.36		1000.00	982.03		
498>478	55	3.895	3.895		9197	15		35.58 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.964	4.005	-2	100466	19	>100:1			5000.00	5258.29	96.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.964	3.995	-1/1	46370	16	>100:1	Target = 2.44		958.00	1030.43		
527 > 81	65	3.954	3.995		23242	14		1.99 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.569	4.619	-3/-1	50624	18		Target = 3.72		964.00	976.08		
627 > 80	65	4.569	4.619		16448	19	>100:1	3.07 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.974	4.016	-2	570822	17	>100:1			1000.00	1045.77	102	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.974	4.016	-2/0	693028	17	>100:1	Target = 13.09		1000.00	1044.74		
513 > 169	51	3.974	4.016		54674	16	>100:1	12.67 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.124	4.169	-2	746407	18	>100:1			5000.00	5966.73	102.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.133	4.169	-2/0	119411	28	>100:1	Target = 1.36	0.12	1000.00	976.80		
570 > 483	58	4.133	4.169		99144	32	>100:1	1.20 (0.68-2.04)	0.14				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.287	4.328	-2	628594	16	>100:1			1000.00	1060.85	101.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.287	4.328	-2/0	588179	15	>100:1	Target = 14.48		1000.00	988.43		
563 > 169	52	4.287	4.328		41129	15	>100:1	14.30 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.287	4.328	-2	616579	17	>100:1			5000.00	5544.28	101.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.287	4.338	-3/-1	132952	32	>100:1	Target = 1.63		1000.00	1027.75		M
584 > 526	60	4.298	4.338		84100	30	>100:1	1.58 (0.81-2.44)	0.09				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.308	1	98072	15	>100:1			1000.00	1176.70	112.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.328	1/0	90114	15	>100:1			1000.00	815.58		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.328	1	56695	14	>100:1			1000.00	1124.78	114.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.338	4.347	0/-1	53858	15	>100:1	Target = 1.09		1000.00	897.16		
512 > 219	57	4.338	4.347		52889	14	>100:1	1.01 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.472	1	106437	16	>100:1			1000.00	1137.56	124.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.499	4.490	1/0	96585	15	>100:1			1000.00	949.92		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.508	4.499	1	52682	13	>100:1			1000.00	1191.37	116.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.508	4.508	1/0	53767	15	>100:1	Target = 1.02		1000.00	903.67		
526 > 219	59	4.508	4.508		52344	18	>100:1	1.02 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.561	4.611	-3	572611	17	>100:1			1000.00	981.71	97.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.561	4.611	-3/0	624211	17	>100:1	Target = 10.77		1000.00	1030.10		
613 > 169	38	4.561	4.611		61134	18	>100:1	10.21 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.800	4.859	-3/0	604352	21	>100:1	Target = 8.06		1000.00	1120.03		
663 > 169	38	4.806	4.859		73911	19	>100:1	8.17 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.027	5.087	-3	902518	22	>100:1			1000.00	1008.93	119.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.027	5.087	-3/0	759813	22	>100:1	Target = 11.68		1000.00	1047.13		
713 > 169	42	5.027	5.087		66266	20	>100:1	11.46 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.424	5.516	-5	918492	19	>100:1			1000.00	1098.60	117.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.432	5.516	-5/0	618823	19	>100:1	Target = 10.53		1000.00	970.60		
813 > 269	40	5.432	5.516		57994	19	>100:1	10.67 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.828	5.947	-7/-2	787764	36	74:1	Target = 13.30		1000.00	992.70		
913 > 319	40	5.824	5.947		61438	37	>100:1	12.82 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.974	4.016	-2	674491	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.469	2.496	-1	620770	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.234	3.269	-2	543104	20	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.718	1.731	0	540202	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.609	3.651	-2	144309	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A30.d
Injection Date: 13-Aug-2021 21:46:32 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 25
Sample Info: ID CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1026.84	102.7	70 - 130
D 46 13C4_PFBA	545149	543357			99.7	50 - 150
D 50 13C5_PFPeA	512785	545839			106.4	50 - 150
21 PFPeA			1000.00	968.93	96.9	70 - 130
7 PFBS			884.00	908.16	102.7	70 - 130
D 44 13C3_PFBS	165513	177982			107.5	50 - 150
1 4:2 FTS			934.00	889.14	95.2	70 - 130
D 63 13C2_4:2 FTS_2	99301	100282			101	50 - 150
D 49 13C5_PFHxA	593069	622909			105	50 - 150
15 PFHxA			1000.00	945.54	94.6	70 - 130
22 PFPeS			938.00	944.09	100.6	70 - 130
28 GenX			2000.00	2019.61	101	70 - 130
D 66 13C3_GenX	1148403	1053395			91.7	50 - 150
D 47 13C4_PFHpA	470133	480745			102.3	50 - 150
13 PFHpA			1000.00	1040.74	104.1	70 - 130
D 45 13C3_PFHxS	127100	127527			100.3	50 - 150
14 PFHxS			910.00	965.43	106.1	70 - 130
29 ADONA			942.00	998.35	106	70 - 130
D 64 13C2_6:2 FTS_2	89414	85839			96	50 - 150
2 6:2 FTS			948.00	990.53	104.5	70 - 130
D 53 13C8_PFOA	458188	493338			107.7	50 - 150
20 PFOA			1000.00	967.42	96.7	70 - 130
12 PFHpS			952.00	1103.21	115.9	70 - 130
18 PFOS			928.00	1004.64	108.3	70 - 130
D 54 13C8_PFOS	138084	126718			91.8	50 - 150
17 PFNA			1000.00	980.05	98	70 - 130
D 56 13C9_PFNA	607872	575182			94.6	50 - 150
30 9Cl-PF3ONS			932.00	945.17	101.4	70 - 130
D 55 13C8_PFOSA	268873	279288			103.9	50 - 150
19 PFOSA			1000.00	969.70	97	70 - 130
16 PFNS			960.00	996.92	103.8	70 - 130
D 65 13C2_8:2 FTS_2	103831	98132			94.5	50 - 150
3 8:2 FTS			958.00	1034.81	108	70 - 130
10 PFDA			1000.00	929.89	93	70 - 130
D 51 13C6_PFDA	559431	565465			101.1	50 - 150
6 N-MeFOSAA			1000.00	1052.50	105.2	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	728447	647466			88.9	50 - 150
9 PFDS			964.00	972.64	100.9	70 - 130
D 60 d5-EtFOSAA	606019	654814			108.1	50 - 150
D 52 13C7_PFUdA	617097	589830			95.6	50 - 150
5 N-EtFOSAA			1000.00	931.87	93.2	70 - 130
25 PFUdA			1000.00	947.84	94.8	70 - 130
D 61 d7-MeFOSE	86996	84868			97.6	50 - 150
32 MeFOSE			1000.00	953.03	95.3	70 - 130
D 57 d3-MeFOSA	49557	53062			107.1	50 - 150
26 MeFOSA			1000.00	1019.79	102	70 - 130
31 11Cl-PF3OUDS			942.00	966.72	102.6	70 - 130
D 62 d9-EtFOSE	85575	99886			116.7	50 - 150
33 EtFOSE			1000.00	998.99	99.9	70 - 130
D 59 d5-EtFOSA	45385	49558			109.2	50 - 150
27 EtFOSA			1000.00	1082.41	108.2	70 - 130
11 PFDoA			1000.00	1002.87	100.3	70 - 130
D 38 13C2_PFDoA	589341	572519			97.1	50 - 150
4 10:2 FTS			964.00	834.43	86.6	70 - 130
34 PFDOS			968.00	1066.80	110.2	70 - 130
24 PFTrDA			1000.00	1035.07	103.5	70 - 130
23 PFTeDA			1000.00	1002.22	100.2	70 - 130
D 42 13C2_PFTeDA	756606	843548			111.5	50 - 150
35 PFHxDA			1000.00	998.04	99.8	70 - 130
D 40 13C2_PFHxDA	781901	846602			108.3	50 - 150
36 PFODA			1000.00	1009.70	101	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A30.d
Injection Date: 13-Aug-2021 21:46:32 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 25
Sample Info: ID CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.724	0	543357	21	>100:1			1000.00	978.27	99.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.731	0/0	557623	21	>100:1			1000.00	1026.84		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.098	2.120	-1	545839	16	>100:1			1000.00	1048.61	106.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.120	-1/0	576659	15	>100:1			1000.00	968.93		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.172	-1	177982	16	>100:1			1000.00	992.11	107.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.172	-1/0	192713	16	>100:1	Target = 3.26		884.00	908.16		
298.9 > 99	44	2.151	2.172		54639	15	>100:1	3.52 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.523	-1/0	150783	16	>100:1	Target = 3.15		938.00	944.09		
349 > 99	44	2.496	2.523		49197	16	>100:1	3.06 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.424	2.451	-1	100282	19	>100:1			5000.00	5019.02	101	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.424	2.451	-1/0	38406	16		Target = 1.68		934.00	889.14		
327 > 81	63	2.424	2.451		24242	19	>100:1	1.58 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.469	2.487	-1	622909	18	>100:1			1000.00	1064.98	105	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.469	2.487	-1/0	615439	18	>100:1	Target = 18.18		1000.00	945.54		
313 > 119	49	2.469	2.487		34395	21	>100:1	17.89 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.583	2.614	-1	1053395	19	>100:1			5000.00	4892.29	91.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.583	2.614	-1/0	297118	19	>100:1	Target = 0.79		2000.00	2019.61		
285 > 185	66	2.583	2.614		366863	19	>100:1	0.80 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.845	2.873	-1	480745	17	>100:1			1000.00	993.83	102.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.845	2.873	-1/0	558904	18	>100:1	Target = 3.65		1000.00	1040.74		
363 > 169	47	2.845	2.873		151872	18	>100:1	3.68 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.854	2.888	-2	127527	17				1000.00	949.74	100.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.854	2.888	-2/0	134857	25	>100:1	Target = 3.10	0.15	910.00	965.43		
399 > 99	45	2.854	2.888		44866	24	>100:1	3.00 (1.55-4.66)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.880	2.912	-1/1	838830	18	>100:1	Target = 3.01		942.00	998.35		
377 > 85	45	2.880	2.912		264421	17	>100:1	3.17 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.234	3.276	-2/0	133868	20	>100:1	Target = 2.85		952.00	1103.21		
449 > 99	45	3.234	3.276		46432	28	>100:1	2.88 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.201	3.241	-2	85839	21	>100:1			5000.00	5319.95	96	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.201	3.241	-2/0	41339	20		Target = 1.74		948.00	990.53		
427 > 81	64	3.208	3.241		21360	20	>100:1	1.93 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.228	3.269	-2	493338	22	>100:1			1000.00	1059.11	107.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.234	3.262	-1/1	475032	21	>100:1	Target = 2.92		1000.00	967.42		
413 > 169	53	3.228	3.262		165753	21	>100:1	2.86 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.609	3.651	-2	126718	18	>100:1			1000.00	952.54	91.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.609	3.651	-2/0	144296	36	>100:1	Target = 3.34	0.27	928.00	1004.64		
499 > 99	54	3.609	3.651		41092	34	>100:1	3.51 (1.67-5.02)	0.14				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.814	3.854	-2/0	454233	18	>100:1			932.00	945.17		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.954	4.005	-3/-1	103383	18		Target = 2.63		960.00	996.92		
549 > 99	54	3.954	4.005		45833	15	>100:1	2.25 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.257	4.297	-2/0	101876	16	>100:1	Target = 2.65		964.00	972.64		
599 > 99	54	4.257	4.297		37555	21	>100:1	2.71 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.420	4.472	-3/-1	407488	18	>100:1			942.00	966.72		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.769	4.826	-3/-1	101196	18	>100:1	Target = 3.08		968.00	1066.80		
699 > 99	54	4.769	4.826		31892	21	>100:1	3.17 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.609	3.657	-2	575182	21	>100:1			1000.00	1009.57	94.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.617	3.657	-2/0	620004	21	>100:1	Target = 6.55		1000.00	980.05		
463 > 169	56	3.609	3.657		100414	19	>100:1	6.17 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.895	3.904	0	279288	19	>100:1			1000.00	1023.38	103.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.895	3.895	0/0	303405	19	>100:1	Target = 33.36		1000.00	969.70		
498>478	55	3.887	3.895		10560	21		28.73 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.954	4.005	-3	98132	18	>100:1			5000.00	5136.13	94.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.963	3.995	-1/2	45485	15	>100:1	Target = 2.44		958.00	1034.81		
527 > 81	65	3.954	3.995		21757	14		2.09 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.569	4.619	-3/0	42272	17		Target = 3.72		964.00	834.43		
627 > 80	65	4.569	4.619		11906	21	>100:1	3.55 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.963	4.016	-3	565465	18	>100:1			1000.00	1035.95	101.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.963	4.016	-3/0	611056	16	>100:1	Target = 13.09		1000.00	929.89		
513 > 169	51	3.963	4.016		44556	16	>100:1	13.71 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.124	4.169	-2	647466	18	>100:1			5000.00	5175.80	88.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.133	4.169	-2/0	111610	31		Target = 1.36	0.07	1000.00	1052.50		M
570 > 483	58	4.124	4.169		82701	32		1.34 (0.68-2.04)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.277	4.328	-3	589830	17	>100:1			1000.00	995.43	95.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.277	4.328	-3/0	529243	16	>100:1	Target = 14.48		1000.00	947.84		
563 > 169	52	4.287	4.328		37588	15	>100:1	14.08 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.287	4.328	-2	654814	16	>100:1			5000.00	5888.09	108.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.287	4.338	-3/-1	128025	36		Target = 1.63		1000.00	931.87		M
584 > 526	60	4.287	4.338		81115	29	>100:1	1.57 (0.81-2.44)	0.07				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.308	1	84868	14	>100:1			1000.00	1018.27	97.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.328	0/-1	91123	17	>100:1			1000.00	953.03		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.328	1	53062	17	>100:1			1000.00	1052.71	107.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.347	4.347	0/-1	57297	14	>100:1	Target = 1.09		1000.00	1019.79		
512 > 219	57	4.347	4.347		50693	15	>100:1	1.13 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.472	1	99886	15	>100:1			1000.00	1067.55	116.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.499	4.490	1/0	95323	17	>100:1			1000.00	998.99		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.508	4.499	1	49558	14	>100:1			1000.00	1120.73	109.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.508	4.508	0/-1	60583	19	>100:1	Target = 1.02		1000.00	1082.41		
526 > 219	59	4.517	4.508		54437	16	>100:1	1.11 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.552	4.611	-3	572519	16				1000.00	981.55	97.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.552	4.611	-3/0	607612	17	>100:1	Target = 10.77		1000.00	1002.87		
613 > 169	38	4.552	4.611		55624	16	>100:1	10.92 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.794	4.859	-3/0	558421	20	>100:1	Target = 8.06		1000.00	1035.07		
663 > 169	38	4.800	4.859		74810	20	>100:1	7.46 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.016	5.087	-4	843548	20	>100:1			1000.00	943.01	111.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.022	5.087	-3/1	679712	22	>100:1	Target = 11.68		1000.00	1002.22		
713 > 169	42	5.022	5.087		59796	20	>100:1	11.36 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.416	5.516	-6	846602	19	>100:1			1000.00	1012.61	108.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.424	5.516	-5/1	586514	20	>100:1	Target = 10.53		1000.00	998.04		
813 > 269	40	5.416	5.516		58134	17	>100:1	10.08 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.810	5.947	-8/-2	738538	34	64:1	Target = 13.30		1000.00	1009.70		
913 > 319	40	5.810	5.947		60724	37	>100:1	12.16 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.963	4.016	-3	673932	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.469	2.496	-1	613391	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.228	3.269	-2	537162	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.718	1.731	0	516995	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.609	3.651	-2	139621	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A44.d
Injection Date: 14-Aug-2021 00:15:27 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 39
Sample Info: ID CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1018.29	101.8	70 - 130
D 46 13C4_PFBA	545149	510721			93.7	50 - 150
D 50 13C5_PFPeA	512785	494750			96.5	50 - 150
21 PFPeA			1000.00	1020.30	102	70 - 130
7 PFBS			884.00	954.15	107.9	70 - 130
D 44 13C3_PFBS	165513	161417			97.5	50 - 150
1 4:2 FTS			934.00	954.57	102.2	70 - 130
D 63 13C2_4:2 FTS_2	99301	92866			93.5	50 - 150
D 49 13C5_PFHxA	593069	564049			95.1	50 - 150
15 PFHxA			1000.00	970.03	97	70 - 130
22 PFPeS			938.00	971.87	103.6	70 - 130
28 GenX			2000.00	1908.72	95.4	70 - 130
D 66 13C3_GenX	1148403	1037763			90.4	50 - 150
D 47 13C4_PFHpA	470133	441336			93.9	50 - 150
13 PFHpA			1000.00	1023.35	102.3	70 - 130
D 45 13C3_PFHxS	127100	125237			98.5	50 - 150
14 PFHxS			910.00	975.89	107.2	70 - 130
29 ADONA			942.00	950.41	100.9	70 - 130
D 64 13C2_6:2 FTS_2	89414	81495			91.1	50 - 150
2 6:2 FTS			948.00	944.47	99.6	70 - 130
D 53 13C8_PFOA	458188	469944			102.6	50 - 150
20 PFOA			1000.00	952.13	95.2	70 - 130
12 PFHpS			952.00	1056.29	111	70 - 130
18 PFOS			928.00	946.77	102	70 - 130
D 54 13C8_PFOS	138084	123213			89.2	50 - 150
17 PFNA			1000.00	1034.69	103.5	70 - 130
D 56 13C9_PFNA	607872	500949			82.4	50 - 150
30 9Cl-PF3ONS			932.00	923.80	99.1	70 - 130
D 55 13C8_PFOSA	268873	253861			94.4	50 - 150
19 PFOSA			1000.00	961.46	96.1	70 - 130
16 PFNS			960.00	974.44	101.5	70 - 130
D 65 13C2_8:2 FTS_2	103831	92232			88.8	50 - 150
3 8:2 FTS			958.00	909.66	95	70 - 130
10 PFDA			1000.00	1030.08	103	70 - 130
D 51 13C6_PFDA	559431	499833			89.3	50 - 150
6 N-MeFOSAA			1000.00	1076.99	107.7	70 - 130

Report Date: 15-Aug-2021 10:21:11 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A44.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	728447	639061			87.7	50 - 150
9 PFDS			964.00	1018.94	105.7	70 - 130
D 60 d5-EtFOSAA	606019	599504			98.9	50 - 150
D 52 13C7_PFUdA	617097	531779			86.2	50 - 150
5 N-EtFOSAA			1000.00	938.39	93.8	70 - 130
25 PFUdA			1000.00	983.22	98.3	70 - 130
D 61 d7-MeFOSE	86996	82674			95	50 - 150
32 MeFOSE			1000.00	983.69	98.4	70 - 130
D 57 d3-MeFOSA	49557	51384			103.7	50 - 150
26 MeFOSA			1000.00	1026.28	102.6	70 - 130
31 11Cl-PF3OUDS			942.00	960.91	102	70 - 130
D 62 d9-EtFOSE	85575	94212			110.1	50 - 150
33 EtFOSE			1000.00	966.21	96.6	70 - 130
D 59 d5-EtFOSA	45385	48608			107.1	50 - 150
27 EtFOSA			1000.00	880.06	88	70 - 130
11 PFDoA			1000.00	1041.28	104.1	70 - 130
D 38 13C2_PFDoA	589341	490485			83.2	50 - 150
4 10:2 FTS			964.00	871.40	90.4	70 - 130
34 PFDOS			968.00	1019.56	105.3	70 - 130
24 PFTrDA			1000.00	1072.26	107.2	70 - 130
23 PFTeDA			1000.00	1028.77	102.9	70 - 130
D 42 13C2_PFTeDA	756606	799067			105.6	50 - 150
35 PFHxDA			1000.00	1011.11	101.1	70 - 130
D 40 13C2_PFHxDA	781901	791576			101.2	50 - 150
36 PFODA			1000.00	974.75	97.5	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A44.d
Injection Date: 14-Aug-2021 00:15:27 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 39
Sample Info: ID CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.724	0	510721	21	>100:1			1000.00	919.51	93.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.731	0/0	519765	21	>100:1			1000.00	1018.29		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.099	2.120	-1	494750	17	>100:1			1000.00	950.47	96.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.099	2.120	-1/0	550398	16	>100:1			1000.00	1020.30		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.152	2.172	-1	161417	15	>100:1			1000.00	899.77	97.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.152	2.172	-1/0	183628	15	>100:1	Target = 3.26		884.00	954.15		
298.9 > 99	44	2.152	2.172		51442	18	>100:1	3.56 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.523	-1/0	140773	18	>100:1	Target = 3.15		938.00	971.87		
349 > 99	44	2.496	2.523		47269	15	>100:1	2.97 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.425	2.451	-1	92866	15	>100:1			5000.00	4647.85	93.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.425	2.451	-1/0	38183	16		Target = 1.68		934.00	954.57		
327 > 81	63	2.425	2.451		19082	15	>100:1	2.00 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.487	-1	564049	18	>100:1			1000.00	964.35	95.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.487	-1/0	571720	18	>100:1	Target = 18.18		1000.00	970.03		
313 > 119	49	2.460	2.487		30419	16	>100:1	18.79 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.614	-2	1037763	19	>100:1			5000.00	4819.69	90.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.614	-2/0	276638	19	>100:1	Target = 0.79		2000.00	1908.72		
285 > 185	66	2.575	2.614		347767	19	>100:1	0.79 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.837	2.873	-2	441336	18	>100:1			1000.00	912.36	93.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.837	2.873	-2/0	504518	18	>100:1	Target = 3.65		1000.00	1023.35		
363 > 169	47	2.837	2.873		129945	24	>100:1	3.88 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.855	2.888	-2	125237	18	>100:1			1000.00	932.69	98.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.855	2.888	-2/0	133870	26	>100:1	Target = 3.10	0.16	910.00	975.89		
399 > 99	45	2.855	2.888		43729	26	>100:1	3.06 (1.55-4.66)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.912	-2/0	784210	18	>100:1	Target = 3.01		942.00	950.41		
377 > 85	45	2.873	2.912		260925	19	>100:1	3.00 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.234	3.276	-2/0	125873	27	>100:1	Target = 2.85		952.00	1056.29		
449 > 99	45	3.227	3.276		43185	20	>100:1	2.91 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.200	3.241	-2	81495	28	>100:1			5000.00	5050.73	91.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.200	3.241	-2/0	37422	25		Target = 1.74		948.00	944.47		
427 > 81	64	3.200	3.241		20473	17	>100:1	1.82 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.227	3.269	-2	469944	22	>100:1			1000.00	1008.89	102.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.227	3.262	-2/0	445354	21	>100:1	Target = 2.92		1000.00	952.13		
413 > 169	53	3.227	3.262		158079	21	>100:1	2.81 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.600	3.651	-3	123213	17	>100:1			1000.00	926.19	89.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.608	3.651	-2/1	132224	38	>100:1	Target = 3.34	0.31	928.00	946.77		
499 > 99	54	3.600	3.651		41151	32	>100:1	3.21 (1.67-5.02)	0.10				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.812	3.854	-2/1	431685	18	>100:1			932.00	923.80		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.943	4.005	-3/0	98257	18	>100:1	Target = 2.63		960.00	974.44		
549 > 99	54	3.952	4.005		39616	16	>100:1	2.48 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.255	4.297	-2/1	103773	16	>100:1	Target = 2.65		964.00	1018.94		
599 > 99	54	4.255	4.297		38617	15	>100:1	2.68 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.411	4.472	-3/0	393837	18	>100:1			942.00	960.91		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.754	4.826	-4/-1	94039	20	>100:1	Target = 3.08		968.00	1019.56		
699 > 99	54	4.754	4.826		30745	19		3.05 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.608	3.657	-2	500949	18	>100:1			1000.00	879.27	82.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.608	3.657	-2/0	570092	20	>100:1	Target = 6.55		1000.00	1034.69		
463 > 169	56	3.608	3.657		96632	20	>100:1	5.89 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.894	3.904	0	253861	16	>100:1			1000.00	930.20	94.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.894	3.895	0/0	273440	16	>100:1	Target = 33.36		1000.00	961.46		
498>478	55	3.894	3.895		8721	13		31.35 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.952	4.005	-3	92232	18	>100:1			5000.00	4827.33	88.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.962	3.995	-1/2	37580	16	>100:1	Target = 2.44		958.00	909.66		
527 > 81	65	3.952	3.995		16428	21		2.28 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.559	4.619	-3/0	41491	18		Target = 3.72		964.00	871.40		
627 > 80	65	4.551	4.619		10891	15		3.80 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.962	4.016	-3	499833	16	>100:1			1000.00	915.71	89.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.962	4.016	-3/0	598329	17	>100:1	Target = 13.09		1000.00	1030.08		
513 > 169	51	3.962	4.016		45075	15	>100:1	13.27 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.114	4.169	-3	639061	17	>100:1			5000.00	5108.61	87.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.123	4.169	-2/1	112725	32	>100:1	Target = 1.36	0.09	1000.00	1076.99		M
570 > 483	58	4.123	4.169		78792	30	>100:1	1.43 (0.68-2.04)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.275	4.328	-3	531779	17	>100:1			1000.00	897.46	86.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.275	4.328	-3/0	494962	16	>100:1	Target = 14.48		1000.00	983.22		
563 > 169	52	4.265	4.328		35275	17	98:1	14.03 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.275	4.328	-3	599504	16	>100:1			5000.00	5390.75	98.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.286	4.338	-3/0	118031	34	>100:1	Target = 1.63		1000.00	938.39		M
584 > 526	60	4.286	4.338		66592	31	>100:1	1.77 (0.81-2.44)	0.28				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.316	4.308	1	82674	15	>100:1			1000.00	991.95	95	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.326	4.328	0/-1	91623	14	>100:1			1000.00	983.69		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.336	4.328	1	51384	17	>100:1			1000.00	1019.42	103.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.336	4.347	0/-1	55838	14	>100:1	Target = 1.09		1000.00	1026.28		
512 > 219	57	4.336	4.347		47839	14	>100:1	1.16 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.480	4.472	1	94212	21	>100:1			1000.00	1006.90	110.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.489	4.490	0/-1	86958	16	>100:1			1000.00	966.21		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.497	4.499	0	48608	16	>100:1			1000.00	1099.24	107.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.506	4.508	0/0	48313	15	>100:1	Target = 1.02		1000.00	880.06		
526 > 219	59	4.506	4.508		51607	18	>100:1	0.93 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.542	4.611	-4	490485	18	>100:1			1000.00	840.91	83.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.542	4.611	-4/0	540486	17	>100:1	Target = 10.77		1000.00	1041.28		
613 > 169	38	4.542	4.611		49647	14	>100:1	10.88 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.787	4.859	-4/0	495593	21	>100:1	Target = 8.06		1000.00	1072.26		
663 > 169	38	4.781	4.859		65651	19	>100:1	7.54 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.003	5.087	-5	799067	20	>100:1			1000.00	893.28	105.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.003	5.087	-5/0	660927	21	>100:1	Target = 11.68		1000.00	1028.77		
713 > 169	42	5.003	5.087		59203	21	>100:1	11.16 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.404	5.516	-6	791576	19	>100:1			1000.00	946.80	101.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.404	5.516	-6/0	555576	18	>100:1	Target = 10.53		1000.00	1011.11		
813 > 269	40	5.404	5.516		55310	18	>100:1	10.04 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.787	5.947	-9/-3	666634	25	65:1	Target = 13.30		1000.00	974.75		
913 > 319	40	5.787	5.947		55601	25	>100:1	11.98 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.962	4.016	-3	640902	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.496	-2	546538	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.227	3.269	-2	493560	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.718	1.731	0	485988	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.608	3.651	-2	128202	22	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A53.d
Injection Date: 14-Aug-2021 01:51:40 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 48
Sample Info: ID CCV 1000C_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1030.99	103.1	70 - 130
D 46 13C4_PFBA	545149	563349			103.3	50 - 150
D 50 13C5_PFPeA	512785	536653			104.7	50 - 150
21 PFPeA			1000.00	1001.15	100.1	70 - 130
7 PFBS			884.00	878.17	99.3	70 - 130
D 44 13C3_PFBS	165513	185697			112.2	50 - 150
1 4:2 FTS			934.00	886.86	95	70 - 130
D 63 13C2_4:2 FTS_2	99301	101878			102.6	50 - 150
D 49 13C5_PFHxA	593069	613439			103.4	50 - 150
15 PFHxA			1000.00	928.47	92.8	70 - 130
22 PFPeS			938.00	873.48	93.1	70 - 130
28 GenX			2000.00	1935.56	96.8	70 - 130
D 66 13C3_GenX	1148403	1106252			96.3	50 - 150
D 47 13C4_PFHpA	470133	474971			101	50 - 150
13 PFHpA			1000.00	941.24	94.1	70 - 130
D 45 13C3_PFHxS	127100	141083			111	50 - 150
14 PFHxS			910.00	880.19	96.7	70 - 130
29 ADONA			942.00	933.76	99.1	70 - 130
D 64 13C2_6:2 FTS_2	89414	91452			102.3	50 - 150
2 6:2 FTS			948.00	817.75	86.3	70 - 130
D 53 13C8_PFOA	458188	491683			107.3	50 - 150
20 PFOA			1000.00	938.10	93.8	70 - 130
12 PFHpS			952.00	976.54	102.6	70 - 130
18 PFOS			928.00	860.66	92.7	70 - 130
D 54 13C8_PFOS	138084	132118			95.7	50 - 150
17 PFNA			1000.00	989.57	99	70 - 130
D 56 13C9_PFNA	607872	565201			93	50 - 150
30 9Cl-PF3ONS			932.00	917.96	98.5	70 - 130
D 55 13C8_PFOSA	268873	280560			104.3	50 - 150
19 PFOSA			1000.00	936.74	93.7	70 - 130
16 PFNS			960.00	995.90	103.7	70 - 130
D 65 13C2_8:2 FTS_2	103831	99862			96.2	50 - 150
3 8:2 FTS			958.00	974.89	101.8	70 - 130
10 PFDA			1000.00	972.15	97.2	70 - 130
D 51 13C6_PFDA	559431	557403			99.6	50 - 150
6 N-MeFOSAA			1000.00	1023.34	102.3	70 - 130

Report Date: 15-Aug-2021 10:21:16 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A53.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	728447	690193			94.7	50 - 150
9 PFDS			964.00	908.80	94.3	70 - 130
D 60 d5-EtFOSAA	606019	651148			107.4	50 - 150
D 52 13C7_PFUdA	617097	575526			93.3	50 - 150
5 N-EtFOSAA			1000.00	909.30	90.9	70 - 130
25 PFUdA			1000.00	971.87	97.2	70 - 130
D 61 d7-MeFOSE	86996	88388			101.6	50 - 150
32 MeFOSE			1000.00	1055.53	105.6	70 - 130
D 57 d3-MeFOSA	49557	52722			106.4	50 - 150
26 MeFOSA			1000.00	1139.70	114	70 - 130
31 11Cl-PF3OUDS			942.00	928.91	98.6	70 - 130
D 62 d9-EtFOSE	85575	104256			121.8	50 - 150
33 EtFOSE			1000.00	989.07	98.9	70 - 130
D 59 d5-EtFOSA	45385	50364			111	50 - 150
27 EtFOSA			1000.00	952.48	95.2	70 - 130
11 PFDoA			1000.00	1016.37	101.6	70 - 130
D 38 13C2_PFDoA	589341	550490			93.4	50 - 150
4 10:2 FTS			964.00	743.68	77.1	70 - 130
34 PFDOS			968.00	984.55	101.7	70 - 130
24 PFTrDA			1000.00	1019.08	101.9	70 - 130
23 PFTeDA			1000.00	992.71	99.3	70 - 130
D 42 13C2_PFTeDA	756606	844944			111.7	50 - 150
35 PFHxDA			1000.00	1000.52	100.1	70 - 130
D 40 13C2_PFHxDA	781901	861520			110.2	50 - 150
36 PFODA			1000.00	989.58	99	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A53.d
Injection Date: 14-Aug-2021 01:51:40 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 48
Sample Info: ID CCV 1000C_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.724	0	563349	22	>100:1			1000.00	1014.26	103.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.731	0/0	580474	21	>100:1			1000.00	1030.99		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.099	2.120	-1	536653	16	>100:1			1000.00	1030.97	104.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.099	2.120	-1/0	585808	15	>100:1			1000.00	1001.15		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.152	2.172	-1	185697	16	>100:1			1000.00	1035.11	112.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.162	2.172	0/1	194428	16	>100:1	Target = 3.26		884.00	878.17		
298.9 > 99	44	2.152	2.172		56736	16	>100:1	3.42 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.505	2.523	-1/0	145553	18		Target = 3.15		938.00	873.48		
349 > 99	44	2.496	2.523		54116	18	>100:1	2.68 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.425	2.451	-1	101878	16	>100:1			5000.00	5098.90	102.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.425	2.451	-1/0	38917	19	>100:1	Target = 1.68		934.00	886.86		
327 > 81	63	2.425	2.451		21883	24	>100:1	1.77 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.470	2.487	-1	613439	17	>100:1			1000.00	1048.79	103.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.470	2.487	-1/0	595138	18	>100:1	Target = 18.18		1000.00	928.47		
313 > 119	49	2.470	2.487		34175	15	>100:1	17.41 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.583	2.614	-1	1106252	19	>100:1			5000.00	5137.77	96.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.583	2.614	-1/0	299042	19	>100:1	Target = 0.79		2000.00	1935.56		
285 > 185	66	2.583	2.614		375503	19	>100:1	0.79 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.837	2.873	-2	474971	19	>100:1			1000.00	981.89	101	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.846	2.873	-1/1	499401	18	>100:1	Target = 3.65		1000.00	941.24		
363 > 169	47	2.846	2.873		146304	17	>100:1	3.41 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.864	2.888	-1	141083	19	>100:1			1000.00	1050.70	111	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.855	2.888	-2/-1	136020	29	>100:1	Target = 3.10	0.18	910.00	880.19		
399 > 99	45	2.855	2.888		43883	25	>100:1	3.09 (1.55-4.66)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.881	2.912	-1/0	867951	18	>100:1	Target = 3.01		942.00	933.76		
377 > 85	45	2.881	2.912		288423	19	>100:1	3.00 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.234	3.276	-2/-1	131094	19	>100:1	Target = 2.85		952.00	976.54		
449 > 99	45	3.234	3.276		40093	22	>100:1	3.26 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.200	3.241	-2	91452	21	>100:1			5000.00	5667.82	102.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.207	3.241	-2/0	36360	20	>100:1	Target = 1.74		948.00	817.75		
427 > 81	64	3.207	3.241		22088	29	>100:1	1.64 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.227	3.269	-2	491683	21	>100:1			1000.00	1055.56	107.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.234	3.262	-1/1	459091	21	>100:1	Target = 2.92		1000.00	938.10		
413 > 169	53	3.234	3.262		172153	21	>100:1	2.66 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.608	3.651	-2	132118	18	>100:1			1000.00	993.13	95.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.608	3.651	-2/0	128885	36	>100:1	Target = 3.34	0.26	928.00	860.66		
499 > 99	54	3.608	3.651		39885	31	>100:1	3.23 (1.67-5.02)	0.09				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.813	3.854	-2/0	459956	19	>100:1			932.00	917.96		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.953	4.005	-3/-1	107679	17	>100:1	Target = 2.63		960.00	995.90		
549 > 99	54	3.953	4.005		39203	15	>100:1	2.74 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.256	4.297	-2/0	99245	14	>100:1	Target = 2.65		964.00	908.80		
599 > 99	54	4.256	4.297		39994	16	>100:1	2.48 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.419	4.472	-3/-1	408237	17	>100:1			942.00	928.91		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.767	4.826	-3/-1	97373	20	>100:1	Target = 3.08		968.00	984.55		
699 > 99	54	4.767	4.826		30435	20	>100:1	3.19 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.616	3.657	-2	565201	20	>100:1			1000.00	992.05	93	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.616	3.657	-2/0	615164	21	>100:1	Target = 6.55		1000.00	989.57		
463 > 169	56	3.616	3.657		102590	19	>100:1	5.99 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.894	3.904	0	280560	18	>100:1			1000.00	1028.04	104.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.902	3.895	1/1	294426	19	>100:1	Target = 33.36		1000.00	936.74		
498>478	55	3.902	3.895		8756	24	26:1	33.62 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.953	4.005	-3	99862	19				5000.00	5226.68	96.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.962	3.995	-1/2	43607	15	>100:1	Target = 2.44		958.00	974.89		
527 > 81	65	3.962	3.995		24058	22	>100:1	1.81 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.568	4.619	-3/0	38339	17	>100:1	Target = 3.72		964.00	743.68		
627 > 80	65	4.568	4.619		10667	20	67:1	3.59 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.962	4.016	-3	557403	18	>100:1			1000.00	1021.18	99.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.962	4.016	-3/0	629721	18	>100:1	Target = 13.09		1000.00	972.15		
513 > 169	51	3.962	4.016		55835	15		11.27 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.123	4.169	-2	690193	18	>100:1			5000.00	5517.36	94.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.132	4.169	-2/0	115679	29	>100:1	Target = 1.36	0.11	1000.00	1023.34		
570 > 483	58	4.123	4.169		89894	32	>100:1	1.28 (0.68-2.04)	0.27				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.276	4.328	-3	575526	17	>100:1			1000.00	971.29	93.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.276	4.328	-3/0	529500	16	>100:1	Target = 14.48		1000.00	971.87		
563 > 169	52	4.276	4.328		35365	15	>100:1	14.97 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.276	4.328	-3	651148	16	>100:1			5000.00	5855.13	107.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.286	4.338	-3/0	124225	33	>100:1	Target = 1.63		1000.00	909.30		M
584 > 526	60	4.286	4.338		79755	31	>100:1	1.55 (0.81-2.44)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.316	4.308	1	88388	16	>100:1			1000.00	1060.51	101.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.337	4.328	1/0	105110	18	>100:1			1000.00	1055.53		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.346	4.328	2	52722	14	>100:1			1000.00	1045.96	106.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.346	4.347	0/-2	63624	16	>100:1	Target = 1.09		1000.00	1139.70		
512 > 219	57	4.346	4.347		53027	15	>100:1	1.19 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.489	4.472	1	104256	16	>100:1			1000.00	1114.25	121.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.498	4.490	1/0	98505	16	>100:1			1000.00	989.07		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.507	4.499	1	50364	18	>100:1			1000.00	1138.95	111	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.516	4.508	1/0	54178	15	>100:1	Target = 1.02		1000.00	952.48		
526 > 219	59	4.516	4.508		54165	16	>100:1	1.00 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.551	4.611	-3	550490	17	>100:1			1000.00	943.78	93.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.551	4.611	-3/0	592095	18	>100:1	Target = 10.77		1000.00	1016.37		
613 > 169	38	4.551	4.611		61763	18	>100:1	9.58 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.793	4.859	-3/0	528636	20	>100:1	Target = 8.06		1000.00	1019.08		
663 > 169	38	4.793	4.859		69036	20	>100:1	7.65 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.015	5.087	-4	844944	20	>100:1			1000.00	944.57	111.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.015	5.087	-4/0	674375	21	>100:1	Target = 11.68		1000.00	992.71		
713 > 169	42	5.021	5.087		60158	19	>100:1	11.21 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.421	5.516	-5	861520	19	>100:1			1000.00	1030.46	110.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.421	5.516	-5/0	598334	20	>100:1	Target = 10.53		1000.00	1000.52		
813 > 269	40	5.421	5.516		58098	19	>100:1	10.29 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.809	5.947	-8/-3	736580	35	72:1	Target = 13.30		1000.00	989.58		
913 > 319	40	5.802	5.947		56976	27	>100:1	12.92 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.962	4.016	-3	734132	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.470	2.496	-1	587733	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.227	3.269	-2	502659	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.718	1.731	0	534036	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.608	3.651	-2	131242	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421006.d
Injection Date: 14-Aug-2021 13:22:33 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 100_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	101.37	101.4	70 - 130
D 46 13C4_PFBA	574801	528070			91.9	50 - 150
D 50 13C5_PFPeA	538043	506060			94.1	50 - 150
21 PFPeA			100.00	103.57	103.6	70 - 130
7 PFBS			88.400	87.780	99.3	70 - 130
D 44 13C3_PFBS	187099	175048			93.6	50 - 150
1 4:2 FTS			93.400	89.441	95.8	70 - 130
D 63 13C2_4:2 FTS_2	103169	96457			93.5	50 - 150
D 49 13C5_PFHxA	593317	566783			95.5	50 - 150
15 PFHxA			100.00	96.807	96.8	70 - 130
22 PFPeS			93.800	78.584	83.8	70 - 130
28 GenX			200.00	217.98	109	70 - 130
D 66 13C3_GenX	1107213	1043199			94.2	50 - 150
D 47 13C4_PFHpA	479053	435147			90.8	50 - 150
13 PFHpA			100.00	107.37	107.4	70 - 130
D 45 13C3_PFHxS	139557	122565			87.8	50 - 150
14 PFHxS			91.000	97.526	107.2	70 - 130
29 ADONA			94.200	92.850	98.6	70 - 130
D 64 13C2_6:2 FTS_2	86994	84328			96.9	50 - 150
2 6:2 FTS			94.800	100.76	106.3	70 - 130
D 53 13C8_PFOA	486725	471343			96.8	50 - 150
20 PFOA			100.00	113.29	113.3	70 - 130
12 PFHpS			95.200	107.34	112.7	70 - 130
18 PFOS			92.800	96.274	103.7	70 - 130
D 54 13C8_PFOS	130612	121340			92.9	50 - 150
17 PFNA			100.00	104.06	104.1	70 - 130
D 56 13C9_PFNA	580651	533018			91.8	50 - 150
30 9Cl-PF3ONS			93.200	82.486	88.5	70 - 130
D 55 13C8_PFOSA	268160	264521			98.6	50 - 150
19 PFOSA			100.00	104.56	104.6	70 - 130
16 PFNS			96.000	123.47	128.6	70 - 130
D 65 13C2_8:2 FTS_2	97398	83315			85.5	50 - 150
3 8:2 FTS			95.800	75.111	78.4	70 - 130
10 PFDA			100.00	96.238	96.2	70 - 130
D 51 13C6_PFDA	542953	536456			98.8	50 - 150
6 N-MeFOSAA			100.00	97.491	97.5	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	682896			114.5	50 - 150
9 PFDS			96.400	72.117	74.8	70 - 130
D 60 d5-EtFOSAA	592804	647090			109.2	50 - 150
D 52 13C7_PFUdA	631526	526346			83.3	50 - 150
5 N-EtFOSAA			100.00	83.122	83.1	70 - 130
25 PFUdA			100.00	113.13	113.1	70 - 130
D 61 d7-MeFOSE	89085	79416			89.1	50 - 150
32 MeFOSE			100.00	122.27	122.3	70 - 130
D 57 d3-MeFOSA	50589	51765			102.3	50 - 150
26 MeFOSA			100.00	100.96	101	70 - 130
31 11Cl-PF3OUDS			94.200	100.62	106.8	70 - 130
D 62 d9-EtFOSE	90529	92317			102	50 - 150
33 EtFOSE			100.00	103.57	103.6	70 - 130
D 59 d5-EtFOSA	43442	42856			98.7	50 - 150
27 EtFOSA			100.00	105.37	105.4	70 - 130
11 PFDoA			100.00	98.563	98.6	70 - 130
D 38 13C2_PFDoA	595792	542630			91.1	50 - 150
4 10:2 FTS			96.400	96.627	100.2	70 - 130
34 PFDOS			96.800	97.321	100.5	70 - 130
24 PFTrDA			100.00	107.60	107.6	70 - 130
23 PFTeDA			100.00	101.61	101.6	70 - 130
D 42 13C2_PFTeDA	902749	824266			91.3	50 - 150
35 PFHxDA			100.00	107.25	107.3	70 - 130
D 40 13C2_PFHxDA	845704	828267			97.9	50 - 150
36 PFODA			100.00	99.259	99.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421006.d
Injection Date: 14-Aug-2021 13:22:33 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 100_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	1	528070	22	>100:1			1000.00	950.74	91.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.718	1/0	53498	22	53:1			100.00	101.37		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	2	506060	17	>100:1			1000.00	972.19	94.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.098	2/0	57150	16	72:1			100.00	103.57		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	2	175048	15	>100:1			1000.00	975.75	93.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	2/0	18320	16	>100:1	Target = 3.26		88.400	87.780		
298.9 > 99	44	2.151	2.151		5620	22	42:1	3.25 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.496	3/1	12344	26	>100:1	Target = 3.15		93.800	78.584		
349 > 99	44	2.496	2.496		4608	19	41:1	2.67 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.415	2	96457	17	>100:1			5000.00	4827.58	93.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.424	2.424	3/1	3716	24	48:1	Target = 1.68		93.400	89.441		
327 > 81	63	2.433	2.424		3566	24	22:1	1.04 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.460	2	566783	17	>100:1			1000.00	969.03	95.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.460	2/0	57333	18	>100:1	Target = 18.18		100.00	96.807		
313 > 119	49	2.469	2.460		3329	17	19:1	17.22 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.575	2	1043199	18	>100:1			5000.00	4844.94	94.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	2/0	31758	21	64:1	Target = 0.79		200.00	217.98		
285 > 185	66	2.575	2.575		39846	19	89:1	0.79 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.836	3	435147	17	>100:1			1000.00	899.56	90.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.836	3/0	52192	18	>100:1	Target = 3.65		100.00	107.37		
363 > 169	47	2.827	2.836		16384	18	>100:1	3.18 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.845	2	122565	17				1000.00	912.79	87.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.845	2/0	13093	24	>100:1	Target = 3.10	0.14	91.000	97.526		
399 > 99	45	2.854	2.845		3807	15	28:1	3.43 (1.55-4.66)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.873	3/1	74978	17	>100:1	Target = 3.01		94.200	92.850		
377 > 85	45	2.873	2.873		25844	18	89:1	2.90 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.221	3.221	3/1	12518	38	>100:1	Target = 2.85		95.200	107.34		
449 > 99	45	3.221	3.221		4168	21	28:1	3.00 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.194	3.194	3	84328	21	>100:1			5000.00	5226.31	96.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.201	3.201	0/-3	4131	17		Target = 1.74		94.800	100.76		M
427 > 81	64	3.201	3.201		1444	13	20:1	2.86 (0.87-2.62)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.221	3.221	3	471343	22	>100:1			1000.00	1011.89	96.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.214	3.214	0/-3	53151	17	33:1	Target = 2.92		100.00	113.29		M
413 > 169	53	3.214	3.214		15683	18	53:1	3.38 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.593	3.593	3	121340	21	>100:1			1000.00	912.11	92.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.601	3.601	4/1	13241	33	60:1	Target = 3.34	0.43	92.800	96.274		
499 > 99	54	3.593	3.601		2388	27	27:1	5.54 (1.67-5.02)	0.17				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.806	3.806	3/0	37959	17	>100:1			93.200	82.486		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.945	3.945	3/0	12261	22	63:1	Target = 2.63		96.000	123.47		
549 > 99	54	3.945	3.945		4107	14	24:1	2.98 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.247	4.247	3/0	7233	18	73:1	Target = 2.65		96.400	72.117		
599 > 99	54	4.257	4.247		2718	17	18:1	2.66 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.405	4.405	3/0	40612	18	>100:1			94.200	100.62		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.748	4.748	2/-1	8840	26	>100:1	Target = 3.08		96.800	97.321		
699 > 99	54	4.748	4.748		3535	19	79:1	2.50 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.601	3.601	3	533018	20	>100:1			1000.00	935.56	91.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.601	3.601	3/0	61005	20	>100:1	Target = 6.55		100.00	104.06		
463 > 169	56	3.601	3.601		8383	18	62:1	7.27 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.895	3.895	4	264521	17	>100:1			1000.00	969.27	98.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.895	3.895	4/0	30985	17	>100:1	Target = 33.36		100.00	104.56		
498>478	55	3.895	3.895		971	14	11:1	31.91 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.937	3	83315	17				5000.00	4360.63	85.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.945	3.945	3/0	2803	16	18:1	Target = 2.44		95.800	75.111		
527 > 81	65	3.954	3.945		794	16	8.3:1	3.53 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.552	4.552	3/0	4156	15	49:1	Target = 3.72		96.400	96.627		
627 > 80	65	4.544	4.552		1146	16	14:1	3.62 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.945	3.945	3	536456	17				1000.00	982.81	98.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.954	3.954	3/0	59996	16	>100:1	Target = 13.09		100.00	96.238		
513 > 169	51	3.945	3.954		5309	21	45:1	11.30 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.107	3	682896	18	>100:1			5000.00	5459.02	114.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.115	4.115	0/-3	10904	25	88:1	Target = 1.36	0.09	100.00	97.491		M
570 > 483	58	4.115	4.115		8472	32		1.28 (0.68-2.04)	0.10				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.267	4.267	3	526346	18	>100:1			1000.00	888.29	83.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.267	4.267	3/0	56371	19	>100:1	Target = 14.48		100.00	113.13		
563 > 169	52	4.267	4.267		4587	19	22:1	12.28 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.267	4.267	3	647090	16	>100:1			5000.00	5818.64	109.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	1/-2	11285	28	57:1	Target = 1.63	0.14	100.00	83.122		M
584 > 526	60	4.267	4.267		11115	26		1.01 (0.81-2.44)	0.23				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.318	3	79416	18	>100:1			1000.00	952.86	89.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.328	3/0	10940	14	45:1			100.00	122.27		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.338	3	51765	15	>100:1			1000.00	1026.98	102.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.347	4.347	3/0	5534	18	24:1	Target = 1.09		100.00	100.96		
512 > 219	57	4.347	4.347		5350	13	61:1	1.03 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.481	3	92317	18	>100:1			1000.00	986.65	102	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.499	4.499	3/0	9134	12	80:1			100.00	103.57		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.508	4.508	3	42856	15	>100:1			1000.00	969.17	98.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.517	4.517	3/0	5100	14	40:1	Target = 1.02		100.00	105.37		
526 > 219	59	4.508	4.517		5679	23	28:1	0.89 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.535	2	542630	16	>100:1			1000.00	930.31	91.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.535	4.535	2/0	56599	15	28:1	Target = 10.77		100.00	98.563		
613 > 169	38	4.535	4.535		5912	20	29:1	9.57 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.775	4.775	2/0	55020	19	>100:1	Target = 8.06		100.00	107.60		
663 > 169	38	4.775	4.775		6206	25	92:1	8.86 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.998	3	824266	20	>100:1			1000.00	921.45	91.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	2/-1	67339	20	12:1	Target = 11.68		100.00	101.61		
713 > 169	42	4.992	4.998		6068	36	85:1	11.09 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.390	2	828267	18	>100:1			1000.00	990.68	97.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.390	5.390	2/0	61665	19	13:1	Target = 10.53		100.00	107.25		
813 > 269	40	5.390	5.390		6253	19	>100:1	9.86 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.775	5.775	2/0	71030	23	>100:1	Target = 13.30		100.00	99.259		
913 > 319	40	5.768	5.775		5345	21	>100:1	13.28 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.954	3.954	3	623509	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.460	2	546322	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.221	3	505542	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	489211	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.593	3.593	3	124824	16	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421007.d
Injection Date: 14-Aug-2021 13:33:10 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 97
Sample Info: ID CCV 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	204.17	102.1	70 - 130
D 46 13C4_PFBA	528070	517299			98	50 - 150
D 50 13C5_PFPeA	506060	511696			101.1	50 - 150
21 PFPeA			200.00	205.18	102.6	70 - 130
7 PFBS			176.80	183.04	103.5	70 - 130
D 44 13C3_PFBS	175048	174343			99.6	50 - 150
1 4:2 FTS			186.80	228.31	122.2	70 - 130
D 63 13C2_4:2 FTS_2	96457	96714			100.3	50 - 150
D 49 13C5_PFHxA	566783	569876			100.5	50 - 150
15 PFHxA			200.00	197.63	98.8	70 - 130
22 PFPeS			187.60	182.49	97.3	70 - 130
28 GenX			400.00	425.96	106.5	70 - 130
D 66 13C3_GenX	1043199	1016416			97.4	50 - 150
D 47 13C4_PFHpA	435147	482264			110.8	50 - 150
13 PFHpA			200.00	190.53	95.3	70 - 130
D 45 13C3_PFHxS	122565	127665			104.2	50 - 150
14 PFHxS			182.00	188.05	103.3	70 - 130
29 ADONA			188.40	189.00	100.3	70 - 130
D 64 13C2_6:2 FTS_2	84328	84871			100.6	50 - 150
2 6:2 FTS			189.60	162.03	85.5	70 - 130
D 53 13C8_PFOA	471343	466115			98.9	50 - 150
20 PFOA			200.00	198.73	99.4	70 - 130
12 PFHpS			190.40	214.48	112.6	70 - 130
18 PFOS			185.60	186.61	100.5	70 - 130
D 54 13C8_PFOS	121340	127157			104.8	50 - 150
17 PFNA			200.00	201.50	100.7	70 - 130
D 56 13C9_PFNA	533018	579752			108.8	50 - 150
30 9Cl-PF3ONS			186.40	180.38	96.8	70 - 130
D 55 13C8_PFOSA	264521	251024			94.9	50 - 150
19 PFOSA			200.00	195.67	97.8	70 - 130
16 PFNS			192.00	163.55	85.2	70 - 130
D 65 13C2_8:2 FTS_2	83315	82519			99	50 - 150
3 8:2 FTS			191.60	223.29	116.5	70 - 130
10 PFDA			200.00	203.24	101.6	70 - 130
D 51 13C6_PFDA	536456	516427			96.3	50 - 150
6 N-MeFOSAA			200.00	194.44	97.2	70 - 130

Report Date: 15-Aug-2021 15:02:43 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421007.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	682896	674993			98.8	50 - 150
9 PFDS			192.80	216.88	112.5	70 - 130
D 60 d5-EtFOSAA	647090	591000			91.3	50 - 150
D 52 13C7_PFUdA	526346	574967			109.2	50 - 150
5 N-EtFOSAA			200.00	191.36	95.7	70 - 130
25 PFUdA			200.00	204.59	102.3	70 - 130
D 61 d7-MeFOSE	79416	78848			99.3	50 - 150
32 MeFOSE			200.00	200.93	100.5	70 - 130
D 57 d3-MeFOSA	51765	44020			85	50 - 150
26 MeFOSA			200.00	241.19	120.6	70 - 130
31 11Cl-PF3OUDS			188.40	178.26	94.6	70 - 130
D 62 d9-EtFOSE	92317	91447			99.1	50 - 150
33 EtFOSE			200.00	229.80	114.9	70 - 130
D 59 d5-EtFOSA	42856	42957			100.2	50 - 150
27 EtFOSA			200.00	206.51	103.3	70 - 130
11 PFDoA			200.00	201.55	100.8	70 - 130
D 38 13C2_PFDoA	542630	535743			98.7	50 - 150
4 10:2 FTS			192.80	178.97	92.8	70 - 130
34 PFDOS			193.60	199.33	103	70 - 130
24 PFTrDA			200.00	211.77	105.9	70 - 130
23 PFTeDA			200.00	195.85	97.9	70 - 130
D 42 13C2_PFTeDA	824266	831584			100.9	50 - 150
35 PFHxDA			200.00	212.57	106.3	70 - 130
D 40 13C2_PFHxDA	828267	785304			94.8	50 - 150
36 PFODA			200.00	210.45	105.2	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421007.d
Injection Date: 14-Aug-2021 13:33:10 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 97
Sample Info: ID CCV 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	1	517299	21	>100:1			1000.00	931.35	98	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.718	1/0	105556	21	>100:1			200.00	204.17		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	1	511696	17	>100:1			1000.00	983.02	101.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.098	1/0	114475	20	>100:1			200.00	205.18		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	1	174343	15	>100:1			1000.00	971.82	99.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	1/0	38048	17	>100:1	Target = 3.26		176.80	183.04		
298.9 > 99	44	2.151	2.151		10079	16	96:1	3.77 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.496	1/0	28550	18	>100:1	Target = 3.15		187.60	182.49		
349 > 99	44	2.496	2.496		10053	18	82:1	2.83 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.424	2.415	1	96714	18	>100:1			5000.00	4840.44	100.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.424	0/-1	9511	21	>100:1	Target = 1.68		186.80	228.31		
327 > 81	63	2.424	2.424		6198	21	30:1	1.53 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.460	1	569876	17	>100:1			1000.00	974.31	100.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.460	1/0	117682	18	>100:1	Target = 18.18		200.00	197.63		
313 > 119	49	2.460	2.460		4851	14	72:1	24.25 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.575	1	1016416	17	>100:1			5000.00	4720.55	97.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	1/0	60466	19	>100:1	Target = 0.79		400.00	425.96		
285 > 185	66	2.575	2.575		72361	18	>100:1	0.83 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.836	1	482264	18	>100:1			1000.00	996.97	110.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.836	1/0	102643	19	>100:1	Target = 3.65		200.00	190.53		
363 > 169	47	2.836	2.836		31375	16	>100:1	3.27 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.845	1	127665	18	>100:1			1000.00	950.77	104.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.845	1/0	26297	24	>100:1	Target = 3.10	0.14	182.00	188.05		
399 > 99	45	2.854	2.845		7734	16	56:1	3.40 (1.55-4.66)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.873	1/0	158973	18	>100:1	Target = 3.01		188.40	189.00		
377 > 85	45	2.873	2.873		50664	18	>100:1	3.13 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.221	3.221	1/0	26054	21		Target = 2.85		190.40	214.48		
449 > 99	45	3.221	3.221		9494	18	79:1	2.74 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.194	3.194	1	84871	30	>100:1			5000.00	5259.96	100.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.201	1/0	6686	14	70:1	Target = 1.74		189.60	162.03		
427 > 81	64	3.187	3.201		4796	27	60:1	1.39 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.214	3.221	0	466115	23	>100:1			1000.00	1000.67	98.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.221	3.214	1/1	92199	21	64:1	Target = 2.92		200.00	198.73		
413 > 169	53	3.214	3.214		33445	18	>100:1	2.75 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.593	3.593	1	127157	16	>100:1			1000.00	955.84	104.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.593	3.601	0/-1	26895	34	89:1	Target = 3.34		185.60	186.61		M
499 > 99	54	3.593	3.601		7925	32		3.39 (1.67-5.02)	0.27				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.798	3.806	0/-1	86987	17	>100:1			186.40	180.38		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.937	3.945	0/-1	17019	13	96:1	Target = 2.63		192.00	163.55		
549 > 99	54	3.945	3.945		7682	23	52:1	2.21 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.247	4.247	1/0	22795	23	>100:1	Target = 2.65		192.80	216.88		
599 > 99	54	4.247	4.247		6969	22	30:1	3.27 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.405	4.405	0/-1	75399	17	>100:1			188.40	178.26		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.748	4.748	1/0	18974	16	>100:1	Target = 3.08		193.60	199.33		
699 > 99	54	4.742	4.748		5942	23	>100:1	3.19 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.601	3.601	1	579752	19	>100:1			1000.00	1017.59	108.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.601	3.601	1/0	128484	23	>100:1	Target = 6.55		200.00	201.50		
463 > 169	56	3.601	3.601		16162	23	87:1	7.94 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.895	3.895	1	251024	19	>100:1			1000.00	919.81	94.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.895	3.895	1/0	55027	16	>100:1	Target = 33.36		200.00	195.67		
498>478	55	3.895	3.895		1682	14	12:1	32.71 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.945	3.937	1	82519	21				5000.00	4318.96	99	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.945	3.945	1/0	8253	12	38:1	Target = 2.44		191.60	223.29		M
527 > 81	65	3.945	3.945		4228	12	43:1	1.95 (1.22-3.67)					M
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.552	4.552	1/0	7624	15	85:1	Target = 3.72		192.80	178.97		
627 > 80	65	4.544	4.552		2696	17	16:1	2.82 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.954	3.945	1	516427	17	>100:1			1000.00	946.11	96.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.954	3.954	1/0	121975	19	>100:1	Target = 13.09		200.00	203.24		
513 > 169	51	3.954	3.954		10244	15	48:1	11.90 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.107	1	674993	18	>100:1			5000.00	5395.85	98.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.115	4.115	1/0	21496	31	>100:1	Target = 1.36		200.00	194.44		M
570 > 483	58	4.115	4.115		16753	31		1.28 (0.68-2.04)	0.22				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.267	4.267	1	574967	16	>100:1			1000.00	970.35	109.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.267	4.267	1/0	111356	17	>100:1	Target = 14.48		200.00	204.59		
563 > 169	52	4.267	4.267		7149	19	29:1	15.57 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.267	4.267	1	591000	16	>100:1			5000.00	5314.28	91.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	1/0	23728	35	>100:1	Target = 1.63		200.00	191.36		M
584 > 526	60	4.277	4.267		15975	28	65:1	1.48 (0.81-2.44)	0.19				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.318	1	78848	16	>100:1			1000.00	946.04	99.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.328	1/0	17849	14	>100:1			200.00	200.93		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.338	1	44020	20	>100:1			1000.00	873.32	85	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.347	4.347	1/0	11242	14	51:1	Target = 1.09		200.00	241.19		
512 > 219	57	4.347	4.347		10105	16	90:1	1.11 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.481	0	91447	15	>100:1			1000.00	977.35	99.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.499	4.499	0/0	20075	17	96:1			200.00	229.80		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.508	4.508	0	42957	17	>100:1			1000.00	971.45	100.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.517	4.517	0/0	10019	25	39:1	Target = 1.02		200.00	206.51		
526 > 219	59	4.517	4.517		9849	15	78:1	1.01 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.535	0	535743	17	>100:1			1000.00	918.50	98.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.535	4.535	0/0	114272	16	70:1	Target = 10.77		200.00	201.55		
613 > 169	38	4.544	4.535		9866	14	57:1	11.58 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.775	4.775	1/1	106911	28	>100:1	Target = 8.06		200.00	211.77		
663 > 169	38	4.775	4.775		13298	19	>100:1	8.03 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.998	1	831584	19	>100:1			1000.00	929.63	100.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.992	4.998	0/-1	130942	20	23:1	Target = 11.68		200.00	195.85		
713 > 169	42	4.998	4.998		11742	18	>100:1	11.15 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.390	1	785304	17	>100:1			1000.00	939.30	94.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.390	5.390	1/0	115873	19	27:1	Target = 10.53		200.00	212.57		
813 > 269	40	5.390	5.390		10463	15	>100:1	11.07 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.768	5.775	0/-1	142785	23	13:1	Target = 13.30		200.00	210.45		
913 > 319	40	5.768	5.775		10003	21	>100:1	14.27 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.945	3.954	0	599685	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.460	1	565107	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.221	1	488305	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	499649	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.593	3.593	1	135055	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421025.d
Injection Date: 14-Aug-2021 16:44:25 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 17
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1021.46	102.1	70 - 130
D 46 13C4_PFBA	528070	512053			97	50 - 150
D 50 13C5_PFPeA	506060	487870			96.4	50 - 150
21 PFPeA			1000.00	1010.66	101.1	70 - 130
7 PFBS			884.00	890.88	100.8	70 - 130
D 44 13C3_PFBS	175048	171525			98	50 - 150
1 4:2 FTS			934.00	970.75	103.9	70 - 130
D 63 13C2_4:2 FTS_2	96457	94937			98.4	50 - 150
D 49 13C5_PFHxA	566783	561458			99.1	50 - 150
15 PFHxA			1000.00	978.33	97.8	70 - 130
22 PFPeS			938.00	870.90	92.8	70 - 130
28 GenX			2000.00	1947.79	97.4	70 - 130
D 66 13C3_GenX	1043199	1031151			98.8	50 - 150
D 47 13C4_PFHpA	435147	462562			106.3	50 - 150
13 PFHpA			1000.00	971.06	97.1	70 - 130
D 45 13C3_PFHxS	122565	129726			105.8	50 - 150
14 PFHxS			910.00	880.26	96.7	70 - 130
29 ADONA			942.00	923.21	98	70 - 130
D 64 13C2_6:2 FTS_2	84328	82374			97.7	50 - 150
2 6:2 FTS			948.00	976.19	103	70 - 130
D 53 13C8_PFOA	471343	482729			102.4	50 - 150
20 PFOA			1000.00	914.44	91.4	70 - 130
12 PFHpS			952.00	1031.82	108.4	70 - 130
18 PFOS			928.00	890.89	96	70 - 130
D 54 13C8_PFOS	121340	131623			108.5	50 - 150
17 PFNA			1000.00	989.21	98.9	70 - 130
D 56 13C9_PFNA	533018	526557			98.8	50 - 150
30 9Cl-PF3ONS			932.00	921.67	98.9	70 - 130
D 55 13C8_PFOSA	264521	258889			97.9	50 - 150
19 PFOSA			1000.00	989.92	99	70 - 130
16 PFNS			960.00	984.53	102.6	70 - 130
D 65 13C2_8:2 FTS_2	83315	88563			106.3	50 - 150
3 8:2 FTS			958.00	1056.27	110.3	70 - 130
10 PFDA			1000.00	948.46	94.8	70 - 130
D 51 13C6_PFDA	536456	539288			100.5	50 - 150
6 N-MeFOSAA			1000.00	1099.15	109.9	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	682896	663820			97.2	50 - 150
9 PFDS			964.00	921.95	95.6	70 - 130
D 60 d5-EtFOSAA	647090	621102			96	50 - 150
D 52 13C7_PFUdA	526346	520915			99	50 - 150
5 N-EtFOSAA			1000.00	929.90	93	70 - 130
25 PFUdA			1000.00	1055.42	105.5	70 - 130
D 61 d7-MeFOSE	79416	84784			106.8	50 - 150
32 MeFOSE			1000.00	956.35	95.6	70 - 130
D 57 d3-MeFOSA	51765	49460			95.5	50 - 150
26 MeFOSA			1000.00	1091.08	109.1	70 - 130
31 11Cl-PF3OUDS			942.00	885.48	94	70 - 130
D 62 d9-EtFOSE	92317	88232			95.6	50 - 150
33 EtFOSE			1000.00	1114.97	111.5	70 - 130
D 59 d5-EtFOSA	42856	42781			99.8	50 - 150
27 EtFOSA			1000.00	930.57	93.1	70 - 130
11 PFDoA			1000.00	1054.28	105.4	70 - 130
D 38 13C2_PFDoA	542630	518934			95.6	50 - 150
4 10:2 FTS			964.00	944.10	97.9	70 - 130
34 PFDOS			968.00	914.21	94.4	70 - 130
24 PFTrDA			1000.00	1008.12	100.8	70 - 130
23 PFTeDA			1000.00	1034.12	103.4	70 - 130
D 42 13C2_PFTeDA	824266	805429			97.7	50 - 150
35 PFHxDA			1000.00	980.08	98	70 - 130
D 40 13C2_PFHxDA	828267	853609			103.1	50 - 150
36 PFODA			1000.00	960.75	96.1	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421025.d
Injection Date: 14-Aug-2021 16:44:25 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 17
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.711	1	512053	21	>100:1			1000.00	921.91	97	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.718	1/0	522746	22	>100:1			1000.00	1021.46		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	1	487870	17	>100:1			1000.00	937.25	96.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.098	1/0	537615	15	>100:1			1000.00	1010.66		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	1	171525	15	>100:1			1000.00	956.12	98	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	1/0	182188	15	>100:1	Target = 3.26		884.00	890.88		
298.9 > 99	44	2.151	2.151		54225	15	>100:1	3.35 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.496	1/0	134047	18	>100:1	Target = 3.15		938.00	870.90		
349 > 99	44	2.487	2.496		51596	16	>100:1	2.59 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.415	1	94937	17	>100:1			5000.00	4751.51	98.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.424	0/-1	39696	19	>100:1	Target = 1.68		934.00	970.75		
327 > 81	63	2.416	2.424		23763	21	>100:1	1.67 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.460	1	561458	17	>100:1			1000.00	959.92	99.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.460	1/0	573959	17	>100:1	Target = 18.18		1000.00	978.33		
313 > 119	49	2.460	2.460		28945	17	>100:1	19.82 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.575	1	1031151	19	>100:1			5000.00	4788.98	98.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	1/0	280502	19	>100:1	Target = 0.79		2000.00	1947.79		
285 > 185	66	2.575	2.575		357726	19	>100:1	0.78 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.836	1	462562	17	>100:1			1000.00	956.24	106.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.836	1/0	501761	18	>100:1	Target = 3.65		1000.00	971.06		
363 > 169	47	2.836	2.836		139641	17	>100:1	3.59 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.845	1	129726	17				1000.00	966.12	105.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.845	1/0	125080	26	>100:1	Target = 3.10	0.18	910.00	880.26		
399 > 99	45	2.855	2.845		43492	23	>100:1	2.87 (1.55-4.66)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.873	1/0	789072	20	>100:1	Target = 3.01		942.00	923.21		
377 > 85	45	2.873	2.873		254273	18	>100:1	3.10 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.226	3.221	1/0	127365	22		Target = 2.85		952.00	1031.82		
449 > 99	45	3.226	3.221		41258	20	>100:1	3.08 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.193	3.194	0	82374	21				5000.00	5105.20	97.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.193	3.201	0/0	39096	22		Target = 1.74		948.00	976.19		
427 > 81	64	3.193	3.201		24346	24	>100:1	1.60 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.213	3.221	0	482729	22	>100:1			1000.00	1036.33	102.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.220	3.214	1/1	439363	19	>100:1	Target = 2.92		1000.00	914.44		
413 > 169	53	3.213	3.214		159883	21	>100:1	2.74 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.592	3.593	0	131623	18	>100:1			1000.00	989.41	108.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.600	3.601	0/0	132912	37	>100:1	Target = 3.34	0.25	928.00	890.89		
499 > 99	54	3.600	3.601		37835	29	47:1	3.51 (1.67-5.02)	0.09				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.804	3.806	0/0	460084	18	>100:1			932.00	921.67		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.943	3.945	0/0	106050	16	>100:1	Target = 2.63		960.00	984.53		
549 > 99	54	3.943	3.945		40879	17	>100:1	2.59 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.244	4.247	0/0	100304	16		Target = 2.65		964.00	921.95		
599 > 99	54	4.244	4.247		35002	22	>100:1	2.86 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.403	4.405	0/0	387694	17	>100:1			942.00	885.48		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.753	4.748	1/1	90078	19	>100:1	Target = 3.08		968.00	914.21		
699 > 99	54	4.753	4.748		29689	19	>100:1	3.03 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.600	3.601	0	526557	19	>100:1			1000.00	924.22	98.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.600	3.601	0/0	572898	19	>100:1	Target = 6.55		1000.00	989.21		
463 > 169	56	3.600	3.601		88028	18	>100:1	6.50 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.885	3.895	0	258889	17	>100:1			1000.00	948.63	97.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.893	3.895	0/0	287108	19	>100:1	Target = 33.36		1000.00	989.92		
498>478	55	3.885	3.895		8670	22		33.11 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.943	3.937	1	88563	16	>100:1			5000.00	4635.30	106.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.943	3.945	0/-1	41901	16	>100:1	Target = 2.44		958.00	1056.27		
527 > 81	65	3.943	3.945		22268	22	>100:1	1.88 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.550	4.552	0/-1	43164	16	>100:1	Target = 3.72		964.00	944.10		
627 > 80	65	4.550	4.552		10713	14	88:1	4.02 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.952	3.945	1	539288	17	>100:1			1000.00	988.00	100.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.952	3.954	0/-1	594406	18	>100:1	Target = 13.09		1000.00	948.46		
513 > 169	51	3.952	3.954		46635	16	>100:1	12.74 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.113	4.107	1	663820	18	>100:1			5000.00	5306.53	97.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.113	4.115	0/-1	119501	32		Target = 1.36	0.06	1000.00	1099.15		M
570 > 483	58	4.113	4.115		85147	30		1.40 (0.68-2.04)	0.26				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.265	4.267	0	520915	15	>100:1			1000.00	879.12	99	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.265	4.267	0/0	520457	15	>100:1	Target = 14.48		1000.00	1055.42		
563 > 169	52	4.265	4.267		35054	15	>100:1	14.84 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.265	4.267	0	621102	16	>100:1			5000.00	5584.96	96	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.275	4.267	1/1	121177	35	>100:1	Target = 1.63		1000.00	929.90		M
584 > 526	60	4.275	4.267		74864	30	>100:1	1.61 (0.81-2.44)	0.19				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.315	4.318	0	84784	14	>100:1			1000.00	1017.27	106.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.325	4.328	0/0	91350	16	>100:1			1000.00	956.35		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.335	4.338	0	49460	14	>100:1			1000.00	981.25	95.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.345	4.347	0/0	57141	15	>100:1	Target = 1.09		1000.00	1091.08		
512 > 219	57	4.335	4.347		43556	17	>100:1	1.31 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.479	4.481	0	88232	15	>100:1			1000.00	942.99	95.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.497	4.499	0/0	93977	15	>100:1			1000.00	1114.97		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.506	4.508	0	42781	13	>100:1			1000.00	967.47	99.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.506	4.517	0/0	44962	13	>100:1	Target = 1.02		1000.00	930.57		
526 > 219	59	4.506	4.517		53973	17	>100:1	0.83 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.541	4.535	1	518934	16	>100:1			1000.00	889.68	95.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.541	4.535	1/0	578976	17	>100:1	Target = 10.77		1000.00	1054.28		
613 > 169	38	4.541	4.535		56078	17	>100:1	10.32 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.780	4.775	1/0	492973	20	>100:1	Target = 8.06		1000.00	1008.12		
663 > 169	38	4.780	4.775		63894	19	>100:1	7.71 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.003	4.998	1	805429	19	>100:1			1000.00	900.40	97.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.003	4.998	1/0	669650	20	>100:1	Target = 11.68		1000.00	1034.12		
713 > 169	42	4.997	4.998		59547	20	>100:1	11.24 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.395	5.390	1	853609	18	>100:1			1000.00	1020.99	103.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.395	5.390	1/0	580727	19	>100:1	Target = 10.53		1000.00	980.08		
813 > 269	40	5.395	5.390		56532	16	>100:1	10.27 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.780	5.775	1/0	708553	24	79:1	Target = 13.30		1000.00	960.75		
913 > 319	40	5.773	5.775		57822	32	>100:1	12.25 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.952	3.954	0	633130	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.460	1	592234	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.213	3.221	0	474693	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	1	478992	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.592	3.593	0	137781	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421039.d
Injection Date: 14-Aug-2021 19:13:39 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1010.59	101.1	70 - 130
D 46 13C4_PFBA	528070	533953			101.1	50 - 150
D 50 13C5_PFPeA	506060	517987			102.4	50 - 150
21 PFPeA			1000.00	1000.46	100	70 - 130
7 PFBS			884.00	908.84	102.8	70 - 130
D 44 13C3_PFBS	175048	175211			100.1	50 - 150
1 4:2 FTS			934.00	954.49	102.2	70 - 130
D 63 13C2_4:2 FTS_2	96457	97517			101.1	50 - 150
D 49 13C5_PFHxA	566783	572249			101	50 - 150
15 PFHxA			1000.00	1011.61	101.2	70 - 130
22 PFPeS			938.00	925.74	98.7	70 - 130
28 GenX			2000.00	1933.76	96.7	70 - 130
D 66 13C3_GenX	1043199	1059915			101.6	50 - 150
D 47 13C4_PFHpA	435147	489915			112.6	50 - 150
13 PFHpA			1000.00	989.09	98.9	70 - 130
D 45 13C3_PFHxS	122565	132221			107.9	50 - 150
14 PFHxS			910.00	947.07	104.1	70 - 130
29 ADONA			942.00	967.03	102.7	70 - 130
D 64 13C2_6:2 FTS_2	84328	88411			104.8	50 - 150
2 6:2 FTS			948.00	875.19	92.3	70 - 130
D 53 13C8_PFOA	471343	465698			98.8	50 - 150
20 PFOA			1000.00	1026.38	102.6	70 - 130
12 PFHpS			952.00	999.80	105	70 - 130
18 PFOS			928.00	1003.05	108.1	70 - 130
D 54 13C8_PFOS	121340	126523			104.3	50 - 150
17 PFNA			1000.00	1015.66	101.6	70 - 130
D 56 13C9_PFNA	533018	556221			104.4	50 - 150
30 9Cl-PF3ONS			932.00	942.10	101.1	70 - 130
D 55 13C8_PFOSA	264521	266149			100.6	50 - 150
19 PFOSA			1000.00	972.04	97.2	70 - 130
16 PFNS			960.00	982.26	102.3	70 - 130
D 65 13C2_8:2 FTS_2	83315	92446			111	50 - 150
3 8:2 FTS			958.00	985.41	102.9	70 - 130
10 PFDA			1000.00	963.63	96.4	70 - 130
D 51 13C6_PFDA	536456	558727			104.2	50 - 150
6 N-MeFOSAA			1000.00	898.42	89.8	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	682896	731936			107.2	50 - 150
9 PFDS			964.00	944.94	98	70 - 130
D 60 d5-EtFOSAA	647090	630860			97.5	50 - 150
D 52 13C7_PFUdA	526346	564830			107.3	50 - 150
5 N-EtFOSAA			1000.00	988.12	98.8	70 - 130
25 PFUdA			1000.00	1012.35	101.2	70 - 130
D 61 d7-MeFOSE	79416	84335			106.2	50 - 150
32 MeFOSE			1000.00	1031.79	103.2	70 - 130
D 57 d3-MeFOSA	51765	49232			95.1	50 - 150
26 MeFOSA			1000.00	1069.28	106.9	70 - 130
31 11Cl-PF3OUDS			942.00	971.95	103.2	70 - 130
D 62 d9-EtFOSE	92317	97280			105.4	50 - 150
33 EtFOSE			1000.00	1061.60	106.2	70 - 130
D 59 d5-EtFOSA	42856	46682			108.9	50 - 150
27 EtFOSA			1000.00	1005.38	100.5	70 - 130
11 PFDoA			1000.00	1040.37	104	70 - 130
D 38 13C2_PFDoA	542630	535548			98.7	50 - 150
4 10:2 FTS			964.00	871.25	90.4	70 - 130
34 PFDOS			968.00	983.42	101.6	70 - 130
24 PFTrDA			1000.00	1057.70	105.8	70 - 130
23 PFTeDA			1000.00	1030.45	103	70 - 130
D 42 13C2_PFTeDA	824266	828149			100.5	50 - 150
35 PFHxDA			1000.00	1028.83	102.9	70 - 130
D 40 13C2_PFHxDA	828267	845343			102.1	50 - 150
36 PFODA			1000.00	988.64	98.9	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421039.d
Injection Date: 14-Aug-2021 19:13:39 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.717	1.711	1	533953	21	>100:1			1000.00	961.34	101.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.717	1.718	0/-1	539300	20	>100:1			1000.00	1010.59		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.097	2.088	1	517987	15	>100:1			1000.00	995.11	102.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.097	2.098	0/-1	565039	15	>100:1			1000.00	1000.46		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.150	2.151	0	175211	16	>100:1			1000.00	976.66	100.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.161	2.151	1/1	189856	14	>100:1	Target = 3.26		884.00	908.84		
298.9 > 99	44	2.161	2.151		54688	15	>100:1	3.47 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.504	2.496	1/1	145551	17	>100:1	Target = 3.15		938.00	925.74		
349 > 99	44	2.495	2.496		49156	15	>100:1	2.96 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.423	2.415	1	97517	16	>100:1			5000.00	4880.63	101.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.423	2.424	0/-1	40092	17		Target = 1.68		934.00	954.49		
327 > 81	63	2.423	2.424		23385	19	>100:1	1.71 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.468	2.460	1	572249	17	>100:1			1000.00	978.37	101	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.468	2.460	1/0	604892	19	>100:1	Target = 18.18		1000.00	1011.61		
313 > 119	49	2.468	2.460		32248	17	>100:1	18.75 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.582	2.575	1	1059915	19	>100:1			5000.00	4922.57	101.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.582	2.575	1/0	286249	17	>100:1	Target = 0.79		2000.00	1933.76		
285 > 185	66	2.582	2.575		355836	19	>100:1	0.80 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.844	2.836	1	489915	18	>100:1			1000.00	1012.78	112.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.844	2.836	1/0	541303	18	>100:1	Target = 3.65		1000.00	989.09		
363 > 169	47	2.844	2.836		143254	17	>100:1	3.77 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.853	2.845	1	132221	19				1000.00	984.70	107.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.853	2.845	1/0	137162	25	>100:1	Target = 3.10	0.19	910.00	947.07		
399 > 99	45	2.853	2.845		42707	25	>100:1	3.21 (1.55-4.66)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.879	2.873	1/0	842416	18	>100:1	Target = 3.01		942.00	967.03		
377 > 85	45	2.879	2.873		257159	20	>100:1	3.27 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.232	3.221	1/0	125786	20	>100:1	Target = 2.85		952.00	999.80		
449 > 99	45	3.232	3.221		44517	20	>100:1	2.82 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.205	3.194	1	88411	20	>100:1			5000.00	5479.35	104.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.205	3.201	1/0	37620	22	>100:1	Target = 1.74		948.00	875.19		
427 > 81	64	3.198	3.201		23096	21		1.62 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.225	3.221	1	465698	21	>100:1			1000.00	999.77	98.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.225	3.214	1/0	475749	20	>100:1	Target = 2.92		1000.00	1026.38		
413 > 169	53	3.225	3.214		176377	20	>100:1	2.69 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.606	3.593	1	126523	20	>100:1			1000.00	951.07	104.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.606	3.601	1/0	143846	42	>100:1	Target = 3.34	0.25	928.00	1003.05		
499 > 99	54	3.606	3.601		39871	33	>100:1	3.60 (1.67-5.02)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.810	3.806	1/0	452061	20	>100:1			932.00	942.10		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.950	3.945	1/0	101706	16	>100:1	Target = 2.63		960.00	982.26		
549 > 99	54	3.950	3.945		37895	16	>100:1	2.68 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.250	4.247	1/0	98822	15	>100:1	Target = 2.65		964.00	944.94		
599 > 99	54	4.250	4.247		39385	15	>100:1	2.50 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.415	4.405	1/0	409062	17	>100:1			942.00	971.95		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.758	4.748	1/0	93143	18	>100:1	Target = 3.08		968.00	983.42		
699 > 99	54	4.758	4.748		30097	18	>100:1	3.09 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.606	3.601	1	556221	17	>100:1			1000.00	976.29	104.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.614	3.601	1/0	621354	19	>100:1	Target = 6.55		1000.00	1015.66		
463 > 169	56	3.614	3.601		101505	19	>100:1	6.12 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.900	3.895	1	266149	20	>100:1			1000.00	975.23	100.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.900	3.895	1/0	289829	18	>100:1	Target = 33.36		1000.00	972.04		
498>478	55	3.900	3.895		10559	23		27.44 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.950	3.937	1	92446	17				5000.00	4838.53	111	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.959	3.945	1/0	40804	17	>100:1	Target = 2.44		958.00	985.41		
527 > 81	65	3.950	3.945		20605	18	>100:1	1.98 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.556	4.552	1/0	41580	25		Target = 3.72		964.00	871.25		
627 > 80	65	4.556	4.552		12627	14	>100:1	3.29 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.959	3.945	1	558727	18	>100:1			1000.00	1023.61	104.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.959	3.954	1/0	625684	17	>100:1	Target = 13.09		1000.00	963.63		
513 > 169	51	3.959	3.954		45601	15	>100:1	13.72 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.118	4.107	1	731936	17	>100:1			5000.00	5851.05	107.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.127	4.115	1/0	107700	32	>100:1	Target = 1.36	0.09	1000.00	898.42		M
570 > 483	58	4.127	4.115		90088	31	>100:1	1.19 (0.68-2.04)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.270	4.267	1	564830	16	>100:1			1000.00	953.24	107.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.280	4.267	1/0	541304	16	>100:1	Target = 14.48		1000.00	1012.35		
563 > 169	52	4.270	4.267		38481	14	>100:1	14.06 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.280	4.267	1	630860	17	>100:1			5000.00	5672.70	97.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.280	4.267	1/0	130787	31	>100:1	Target = 1.63		1000.00	988.12		M
584 > 526	60	4.280	4.267		81193	30	>100:1	1.61 (0.81-2.44)	0.20				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.320	4.318	1	84335	15	>100:1			1000.00	1011.88	106.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.330	4.328	1/0	98034	14	>100:1			1000.00	1031.79		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.340	4.338	1	49232	15	>100:1			1000.00	976.72	95.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.349	4.347	1/0	55741	15	>100:1	Target = 1.09		1000.00	1069.28		
512 > 219	57	4.340	4.347		54204	22	>100:1	1.02 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.485	4.481	1	97280	16	>100:1			1000.00	1039.69	105.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.503	4.499	1/0	98654	16	>100:1			1000.00	1061.60		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.503	4.508	0	46682	22	>100:1			1000.00	1055.69	108.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.512	4.517	0/0	53006	15	>100:1	Target = 1.02		1000.00	1005.38		
526 > 219	59	4.512	4.517		47207	15	>100:1	1.12 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.548	4.535	1	535548	17	>100:1			1000.00	918.17	98.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.548	4.535	1/0	589627	16	>100:1	Target = 10.77		1000.00	1040.37		
613 > 169	38	4.548	4.535		54597	18	>100:1	10.79 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.791	4.775	1/0	533781	20	>100:1	Target = 8.06		1000.00	1057.70		
663 > 169	38	4.785	4.775		65327	20	>100:1	8.17 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.008	4.998	1	828149	20	>100:1			1000.00	925.79	100.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.008	4.998	1/0	686100	20	>100:1	Target = 11.68		1000.00	1030.45		
713 > 169	42	5.008	4.998		61641	20	>100:1	11.13 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.402	5.390	1	845343	18	>100:1			1000.00	1011.11	102.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.411	5.390	2/1	603708	18	>100:1	Target = 10.53		1000.00	1028.83		
813 > 269	40	5.411	5.390		56792	18	>100:1	10.63 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.793	5.775	2/1	722056	24	77:1	Target = 13.30		1000.00	988.64		
913 > 319	40	5.786	5.775		58754	26	>100:1	12.28 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.959	3.954	1	636568	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.468	2.460	1	559283	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.232	3.221	1	502358	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.717	1.711	1	501815	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.606	3.593	1	133734	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421051.d
Injection Date: 14-Aug-2021 21:21:24 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 43
Sample Info: ID CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1026.76	102.7	70 - 130
D 46 13C4_PFBA	528070	550226			104.2	50 - 150
D 50 13C5_PFPeA	506060	538519			106.4	50 - 150
21 PFPeA			1000.00	961.98	96.2	70 - 130
7 PFBS			884.00	907.33	102.6	70 - 130
D 44 13C3_PFBS	175048	181815			103.9	50 - 150
1 4:2 FTS			934.00	1028.17	110.1	70 - 130
D 63 13C2_4:2 FTS_2	96457	93986			97.4	50 - 150
D 49 13C5_PFHxA	566783	598201			105.5	50 - 150
15 PFHxA			1000.00	974.37	97.4	70 - 130
22 PFPeS			938.00	951.00	101.4	70 - 130
28 GenX			2000.00	1765.83	88.3	70 - 130
D 66 13C3_GenX	1043199	1149481			110.2	50 - 150
D 47 13C4_PFHpA	435147	478540			110	50 - 150
13 PFHpA			1000.00	985.52	98.6	70 - 130
D 45 13C3_PFHxS	122565	133918			109.3	50 - 150
14 PFHxS			910.00	965.11	106.1	70 - 130
29 ADONA			942.00	956.49	101.5	70 - 130
D 64 13C2_6:2 FTS_2	84328	87692			104	50 - 150
2 6:2 FTS			948.00	931.39	98.2	70 - 130
D 53 13C8_PFOA	471343	463604			98.4	50 - 150
20 PFOA			1000.00	1061.02	106.1	70 - 130
12 PFHpS			952.00	982.36	103.2	70 - 130
18 PFOS			928.00	907.79	97.8	70 - 130
D 54 13C8_PFOS	121340	133954			110.4	50 - 150
17 PFNA			1000.00	1029.19	102.9	70 - 130
D 56 13C9_PFNA	533018	560480			105.2	50 - 150
30 9Cl-PF3ONS			932.00	896.31	96.2	70 - 130
D 55 13C8_PFOSA	264521	266304			100.7	50 - 150
19 PFOSA			1000.00	1010.89	101.1	70 - 130
16 PFNS			960.00	973.83	101.4	70 - 130
D 65 13C2_8:2 FTS_2	83315	93397			112.1	50 - 150
3 8:2 FTS			958.00	1054.04	110	70 - 130
10 PFDA			1000.00	945.97	94.6	70 - 130
D 51 13C6_PFDA	536456	568138			105.9	50 - 150
6 N-MeFOSAA			1000.00	946.65	94.7	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	682896	709241			103.9	50 - 150
9 PFDS			964.00	989.33	102.6	70 - 130
D 60 d5-EtFOSAA	647090	656645			101.5	50 - 150
D 52 13C7_PFUdA	526346	588912			111.9	50 - 150
5 N-EtFOSAA			1000.00	980.88	98.1	70 - 130
25 PFUdA			1000.00	975.53	97.6	70 - 130
D 61 d7-MeFOSE	79416	96509			121.5	50 - 150
32 MeFOSE			1000.00	908.73	90.9	70 - 130
D 57 d3-MeFOSA	51765	52991			102.4	50 - 150
26 MeFOSA			1000.00	1029.96	103	70 - 130
31 11Cl-PF3OUDS			942.00	925.92	98.3	70 - 130
D 62 d9-EtFOSE	92317	104734			113.5	50 - 150
33 EtFOSE			1000.00	1056.39	105.6	70 - 130
D 59 d5-EtFOSA	42856	49343			115.1	50 - 150
27 EtFOSA			1000.00	937.34	93.7	70 - 130
11 PFDoA			1000.00	1030.93	103.1	70 - 130
D 38 13C2_PFDoA	542630	540900			99.7	50 - 150
4 10:2 FTS			964.00	793.00	82.3	70 - 130
34 PFDOS			968.00	969.90	100.2	70 - 130
24 PFTrDA			1000.00	1003.52	100.4	70 - 130
23 PFTeDA			1000.00	1023.82	102.4	70 - 130
D 42 13C2_PFTeDA	824266	838070			101.7	50 - 150
35 PFHxDA			1000.00	1029.66	103	70 - 130
D 40 13C2_PFHxDA	828267	845323			102.1	50 - 150
36 PFODA			1000.00	999.98	100	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421051.d
Injection Date: 14-Aug-2021 21:21:24 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 43
Sample Info: ID CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.722	1.711	1	550226	21	>100:1			1000.00	990.63	104.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.722	1.718	1/0	564628	20	>100:1			1000.00	1026.76		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.094	2.088	1	538519	15	>100:1			1000.00	1034.55	106.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.094	2.098	0/-1	564845	15	>100:1			1000.00	961.98		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.146	2.151	0	181815	14	>100:1			1000.00	1013.47	103.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.146	2.151	0/0	196683	16	>100:1	Target = 3.26		884.00	907.33		
298.9 > 99	44	2.146	2.151		55820	14	>100:1	3.52 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.486	2.496	0/0	155157	17	>100:1	Target = 3.15		938.00	951.00		
349 > 99	44	2.486	2.496		48938	16	>100:1	3.17 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.415	0	93986	17	>100:1			5000.00	4703.91	97.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.415	2.424	0/0	41623	18	>100:1	Target = 1.68		934.00	1028.17		
327 > 81	63	2.415	2.424		25948	16	>100:1	1.60 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.460	0	598201	17	>100:1			1000.00	1022.74	105.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.460	0/0	609050	18	>100:1	Target = 18.18		1000.00	974.37		
313 > 119	49	2.450	2.460		33960	17	>100:1	17.93 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.566	2.575	0	1149481	19	>100:1			5000.00	5338.54	110.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.566	2.575	0/0	283480	18	>100:1	Target = 0.79		2000.00	1765.83		
285 > 185	66	2.566	2.575		383501	18	>100:1	0.73 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.836	0	478540	17	>100:1			1000.00	989.27	110	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.826	2.836	0/0	526825	17	>100:1	Target = 3.65		1000.00	985.52		
363 > 169	47	2.826	2.836		152557	17	>100:1	3.45 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.845	0	133918	16	>100:1			1000.00	997.34	109.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.845	0/0	141569	25	>100:1	Target = 3.10	0.17	910.00	965.11		
399 > 99	45	2.845	2.845		42653	25	>100:1	3.31 (1.55-4.66)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.873	0/0	843932	20	>100:1	Target = 3.01		942.00	956.49		
377 > 85	45	2.854	2.873		266078	18		3.17 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.212	3.221	0/0	125178	20	>100:1	Target = 2.85		952.00	982.36		
449 > 99	45	3.212	3.221		46944	25	>100:1	2.66 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.179	3.194	0	87692	21	>100:1			5000.00	5434.79	104	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.179	3.201	-1/-1	39710	21	>100:1	Target = 1.74		948.00	931.39		
427 > 81	64	3.179	3.201		21638	20	>100:1	1.83 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.221	0	463604	21	>100:1			1000.00	995.28	98.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.214	0/0	489594	21	>100:1	Target = 2.92		1000.00	1061.02		
413 > 169	53	3.205	3.214		178494	21	>100:1	2.74 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.593	0	133954	19	>100:1			1000.00	1006.93	110.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.601	-1/-1	137831	36	>100:1	Target = 3.34	0.28	928.00	907.79		
499 > 99	54	3.574	3.601		41310	36	>100:1	3.33 (1.67-5.02)	0.16				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.806	-1/-1	455349	20	>100:1			932.00	896.31		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.917	3.945	-1/-1	106755	21	>100:1	Target = 2.63		960.00	973.83		
549 > 99	54	3.917	3.945		40207	17	>100:1	2.65 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.221	4.247	-1/-1	109541	14	>100:1	Target = 2.65		964.00	989.33		
599 > 99	54	4.221	4.247		42281	15	>100:1	2.59 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.378	4.405	-1/-1	412578	17	>100:1			942.00	925.92		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.732	4.748	0/0	97258	19	>100:1	Target = 3.08		968.00	969.90		
699 > 99	54	4.725	4.748		30858	19	>100:1	3.15 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.601	-1	560480	19	>100:1			1000.00	983.76	105.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.582	3.601	-1/0	634452	20	>100:1	Target = 6.55		1000.00	1029.19		
463 > 169	56	3.582	3.601		100300	18	>100:1	6.32 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.895	-1	266304	17	>100:1			1000.00	975.80	100.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.876	3.895	-1/0	301590	17	>100:1	Target = 33.36		1000.00	1010.89		
498>478	55	3.868	3.895		11309	23	66:1	26.66 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.926	3.937	0	93397	17	>100:1			5000.00	4888.31	112.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.926	3.945	-1/-1	44095	19	>100:1	Target = 2.44		958.00	1054.04		
527 > 81	65	3.926	3.945		21017	14		2.09 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.522	4.552	-1/-1	38235	18		Target = 3.72		964.00	793.00		
627 > 80	65	4.522	4.552		14110	16	93:1	2.70 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.945	0	568138	18	>100:1			1000.00	1040.85	105.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.934	3.954	-1/-1	624563	17	>100:1	Target = 13.09		1000.00	945.97		
513 > 169	51	3.934	3.954		49425	18	>100:1	12.63 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.107	0	709241	18	>100:1			5000.00	5669.62	103.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.093	4.115	-1/-1	109963	30	>100:1	Target = 1.36	0.08	1000.00	946.65		M
570 > 483	58	4.093	4.115		76212	28	>100:1	1.44 (0.68-2.04)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.242	4.267	-1	588912	16	>100:1			1000.00	993.88	111.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.242	4.267	-1/0	543852	15	>100:1	Target = 14.48		1000.00	975.53		
563 > 169	52	4.252	4.267		40755	22	>100:1	13.34 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.242	4.267	-1	656645	16	>100:1			5000.00	5904.56	101.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.252	4.267	0/1	135135	31		Target = 1.63	0.07	1000.00	980.88		M
584 > 526	60	4.252	4.267		82969	30	>100:1	1.62 (0.81-2.44)	0.12				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.318	-1	96509	20	>100:1			1000.00	1157.95	121.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.302	4.328	-1/0	98806	15	>100:1			1000.00	908.73		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.313	4.338	-1	52991	14	>100:1			1000.00	1051.30	102.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.313	4.347	-2/-1	57791	17	>100:1	Target = 1.09		1000.00	1029.96		
512 > 219	57	4.313	4.347		48298	13	>100:1	1.19 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.481	-1	104734	15	>100:1			1000.00	1119.36	113.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.468	4.499	-1/0	105692	15	>100:1			1000.00	1056.39		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.508	-1	49343	15	>100:1			1000.00	1115.87	115.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.477	4.517	-2/-1	52236	13	>100:1	Target = 1.02		1000.00	937.34		
526 > 219	59	4.486	4.517		50245	18	>100:1	1.03 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.513	4.535	-1	540900	17	>100:1			1000.00	927.34	99.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.535	-1/0	590119	16	>100:1	Target = 10.77		1000.00	1030.93		
613 > 169	38	4.513	4.535		60293	16	>100:1	9.78 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.752	4.775	-1/0	511497	19	>100:1	Target = 8.06		1000.00	1003.52		
663 > 169	38	4.759	4.775		63733	18	>100:1	8.02 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.978	4.998	-1	838070	20	>100:1			1000.00	936.89	101.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.978	4.998	-1/0	689848	20	>100:1	Target = 11.68		1000.00	1023.82		
713 > 169	42	4.978	4.998		59783	19	>100:1	11.53 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.377	5.390	0	845323	19	>100:1			1000.00	1011.08	102.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.377	5.390	0/0	604181	18	>100:1	Target = 10.53		1000.00	1029.66		
813 > 269	40	5.377	5.390		59002	19	>100:1	10.24 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.765	5.775	0/0	730326	23	73:1	Target = 13.30		1000.00	999.98		
913 > 319	40	5.765	5.775		57889	23	>100:1	12.61 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.934	3.954	-1	655726	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.460	0	591352	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.221	0	508381	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.722	1.711	1	520810	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.574	3.593	-1	137965	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421067.d
Injection Date: 15-Aug-2021 00:11:47 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 59
Sample Info: ID CCV 1000C_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1029.40	102.9	70 - 130
D 46 13C4_PFBA	528070	508734			96.3	50 - 150
D 50 13C5_PFPeA	506060	502493			99.3	50 - 150
21 PFPeA			1000.00	996.17	99.6	70 - 130
7 PFBS			884.00	866.63	98	70 - 130
D 44 13C3_PFBS	175048	171197			97.8	50 - 150
1 4:2 FTS			934.00	950.33	101.7	70 - 130
D 63 13C2_4:2 FTS_2	96457	93266			96.7	50 - 150
D 49 13C5_PFHxA	566783	539383			95.2	50 - 150
15 PFHxA			1000.00	1000.54	100.1	70 - 130
22 PFPeS			938.00	897.15	95.6	70 - 130
28 GenX			2000.00	1848.12	92.4	70 - 130
D 66 13C3_GenX	1043199	1045604			100.2	50 - 150
D 47 13C4_PFHpA	435147	432880			99.5	50 - 150
13 PFHpA			1000.00	1038.60	103.9	70 - 130
D 45 13C3_PFHxS	122565	120124			98	50 - 150
14 PFHxS			910.00	1001.17	110	70 - 130
29 ADONA			942.00	995.84	105.7	70 - 130
D 64 13C2_6:2 FTS_2	84328	81539			96.7	50 - 150
2 6:2 FTS			948.00	1012.49	106.8	70 - 130
D 53 13C8_PFOA	471343	468290			99.4	50 - 150
20 PFOA			1000.00	965.02	96.5	70 - 130
12 PFHpS			952.00	1085.73	114	70 - 130
18 PFOS			928.00	934.63	100.7	70 - 130
D 54 13C8_PFOS	121340	127538			105.1	50 - 150
17 PFNA			1000.00	1028.69	102.9	70 - 130
D 56 13C9_PFNA	533018	537584			100.9	50 - 150
30 9Cl-PF3ONS			932.00	921.16	98.8	70 - 130
D 55 13C8_PFOSA	264521	267989			101.3	50 - 150
19 PFOSA			1000.00	967.89	96.8	70 - 130
16 PFNS			960.00	969.62	101	70 - 130
D 65 13C2_8:2 FTS_2	83315	89281			107.2	50 - 150
3 8:2 FTS			958.00	872.61	91.1	70 - 130
10 PFDA			1000.00	1036.22	103.6	70 - 130
D 51 13C6_PFDA	536456	520767			97.1	50 - 150
6 N-MeFOSAA			1000.00	1010.37	101	70 - 130

Report Date: 15-Aug-2021 15:03:08 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421067.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	682896	679523			99.5	50 - 150
9 PFDS			964.00	954.83	99	70 - 130
D 60 d5-EtFOSAA	647090	601196			92.9	50 - 150
D 52 13C7_PFUdA	526346	566372			107.6	50 - 150
5 N-EtFOSAA			1000.00	1041.29	104.1	70 - 130
25 PFUdA			1000.00	1005.05	100.5	70 - 130
D 61 d7-MeFOSE	79416	88409			111.3	50 - 150
32 MeFOSE			1000.00	957.74	95.8	70 - 130
D 57 d3-MeFOSA	51765	42960			83	50 - 150
26 MeFOSA			1000.00	1233.72	123.4	70 - 130
31 11Cl-PF3OUDS			942.00	918.76	97.5	70 - 130
D 62 d9-EtFOSE	92317	92178			99.8	50 - 150
33 EtFOSE			1000.00	1027.11	102.7	70 - 130
D 59 d5-EtFOSA	42856	44243			103.2	50 - 150
27 EtFOSA			1000.00	857.73	85.8	70 - 130
11 PFDoA			1000.00	956.35	95.6	70 - 130
D 38 13C2_PFDoA	542630	559910			103.2	50 - 150
4 10:2 FTS			964.00	809.04	83.9	70 - 130
34 PFDOS			968.00	968.00	100	70 - 130
24 PFTrDA			1000.00	922.24	92.2	70 - 130
23 PFTeDA			1000.00	991.75	99.2	70 - 130
D 42 13C2_PFTeDA	824266	826170			100.2	50 - 150
35 PFHxDA			1000.00	967.64	96.8	70 - 130
D 40 13C2_PFHxDA	828267	839944			101.4	50 - 150
36 PFODA			1000.00	968.70	96.9	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421067.d
Injection Date: 15-Aug-2021 00:11:47 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 59
Sample Info: ID CCV 1000C_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	508734	21	>100:1			1000.00	915.93	96.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.718	0/0	523391	21	>100:1			1000.00	1029.40		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	0	502493	16	>100:1			1000.00	965.34	99.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.098	0/0	545791	16	>100:1			1000.00	996.17		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	0	171197	16	>100:1			1000.00	954.29	97.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	0/0	176891	17	>100:1	Target = 3.26		884.00	866.63		
298.9 > 99	44	2.151	2.151		54134	15	>100:1	3.26 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.487	2.496	0/0	137824	17	>100:1	Target = 3.15		938.00	897.15		
349 > 99	44	2.496	2.496		45928	17	>100:1	3.00 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.415	1	93266	16	>100:1			5000.00	4667.87	96.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.424	0/-1	38177	17	>100:1	Target = 1.68		934.00	950.33		
327 > 81	63	2.416	2.424		20735	19	>100:1	1.84 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.460	1	539383	18	>100:1			1000.00	922.18	95.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.460	1/0	563914	18	>100:1	Target = 18.18		1000.00	1000.54		
313 > 119	49	2.460	2.460		30241	22	>100:1	18.64 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.575	0	1045604	19	>100:1			5000.00	4856.11	100.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	0/0	269879	19	>100:1	Target = 0.79		2000.00	1848.12		
285 > 185	66	2.575	2.575		351077	19	>100:1	0.76 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.836	0	432880	18	>100:1			1000.00	894.88	99.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.836	0/0	502223	17	>100:1	Target = 3.65		1000.00	1038.60		
363 > 169	47	2.836	2.836		132169	16	>100:1	3.79 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.854	2.845	1	120124	17	>100:1			1000.00	894.61	98	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.854	2.845	1/0	131731	26	>100:1	Target = 3.10	0.18	910.00	1001.17		
399 > 99	45	2.854	2.845		42863	26	>100:1	3.07 (1.55-4.66)	0.07				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.873	0/-1	788142	19	>100:1	Target = 3.01		942.00	995.84		
377 > 85	45	2.873	2.873		249656	19	>100:1	3.15 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.227	3.221	1/0	124100	21	>100:1	Target = 2.85		952.00	1085.73		
449 > 99	45	3.221	3.221		39804	19	>100:1	3.11 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.201	3.194	1	81539	23	>100:1			5000.00	5053.45	96.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.194	3.201	0/-1	40139	23	>100:1	Target = 1.74		948.00	1012.49		
427 > 81	64	3.201	3.201		21780	20	>100:1	1.84 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.221	3.221	0	468290	21	>100:1			1000.00	1005.34	99.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.227	3.214	1/1	449794	20	>100:1	Target = 2.92		1000.00	965.02		
413 > 169	53	3.221	3.214		163448	21	>100:1	2.75 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.601	3.593	1	127538	19	>100:1			1000.00	958.70	105.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.601	3.601	1/0	135110	37	>100:1	Target = 3.34	0.22	928.00	934.63		
499 > 99	54	3.601	3.601		38142	33	>100:1	3.54 (1.67-5.02)	0.05				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.806	3.806	1/0	445561	19	>100:1			932.00	921.16		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.945	3.945	1/0	101203	16	>100:1	Target = 2.63		960.00	969.62		
549 > 99	54	3.945	3.945		36067	18	>100:1	2.80 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.247	4.247	1/0	100657	14	>100:1	Target = 2.65		964.00	954.83		
599 > 99	54	4.247	4.247		34525	14		2.91 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.405	4.405	0/-1	389782	18	>100:1			942.00	918.76		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.755	4.748	1/0	92418	20	>100:1	Target = 3.08		968.00	968.00		
699 > 99	54	4.755	4.748		27828	16	>100:1	3.32 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.609	3.601	1	537584	20	>100:1			1000.00	943.58	100.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.609	3.601	1/0	608237	19	>100:1	Target = 6.55		1000.00	1028.69		
463 > 169	56	3.609	3.601		93912	20	>100:1	6.47 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.895	3.895	1	267989	18	>100:1			1000.00	981.97	101.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.895	3.895	1/0	290588	18	>100:1	Target = 33.36		1000.00	967.89		
498>478	55	3.895	3.895		9889	18	26:1	29.38 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.945	3.937	1	89281	16				5000.00	4672.88	107.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.945	3.945	1/0	34896	15	>100:1	Target = 2.44		958.00	872.61		
527 > 81	65	3.954	3.945		18449	24	>100:1	1.89 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.552	4.552	1/0	37289	14	>100:1	Target = 3.72		964.00	809.04		
627 > 80	65	4.552	4.552		11244	15	79:1	3.31 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.954	3.945	1	520767	17	>100:1			1000.00	954.06	97.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.954	3.954	1/0	627105	18	>100:1	Target = 13.09		1000.00	1036.22		
513 > 169	51	3.954	3.954		56630	16	>100:1	11.07 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.115	4.107	1	679523	17	>100:1			5000.00	5432.06	99.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.115	4.115	1/0	112448	29	>100:1	Target = 1.36	0.11	1000.00	1010.37		M
570 > 483	58	4.115	4.115		83674	28	>100:1	1.34 (0.68-2.04)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.267	4.267	1	566372	17	>100:1			1000.00	955.84	107.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.267	4.267	1/0	538868	15	>100:1	Target = 14.48		1000.00	1005.05		
563 > 169	52	4.267	4.267		36814	19	>100:1	14.63 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.267	4.267	1	601196	15	>100:1			5000.00	5405.96	92.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.287	4.267	2/1	131343	32	>100:1	Target = 1.63		1000.00	1041.29		M
584 > 526	60	4.277	4.267		79716	31	>100:1	1.64 (0.81-2.44)	0.08				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.318	1	88409	14	>100:1			1000.00	1060.76	111.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.328	1/0	95395	14	>100:1			1000.00	957.74		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.338	1	42960	15	>100:1			1000.00	852.29	83	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.338	4.347	0/-1	56120	15	>100:1	Target = 1.09		1000.00	1233.72		
512 > 219	57	4.338	4.347		48169	15	>100:1	1.16 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.481	0	92178	16	>100:1			1000.00	985.17	99.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.490	4.499	0/0	90443	15	>100:1			1000.00	1027.11		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.499	4.508	0	44243	19	>100:1			1000.00	1000.53	103.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.508	4.517	0/0	42859	14	>100:1	Target = 1.02		1000.00	857.73		
526 > 219	59	4.508	4.517		44085	15	>100:1	0.97 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.544	4.535	1	559910	17	>100:1			1000.00	959.93	103.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.544	4.535	1/0	566667	18	>100:1	Target = 10.77		1000.00	956.35		
613 > 169	38	4.544	4.535		51948	15	>100:1	10.90 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.782	4.775	1/0	486587	21	>100:1	Target = 8.06		1000.00	922.24		
663 > 169	38	4.782	4.775		62172	19	>100:1	7.82 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.004	4.998	1	826170	21	>100:1			1000.00	923.58	100.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.004	4.998	1/0	658753	21	>100:1	Target = 11.68		1000.00	991.75		
713 > 169	42	5.004	4.998		57194	19	>100:1	11.51 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.390	1	839944	18	>100:1			1000.00	1004.65	101.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.399	5.390	1/0	564178	18	>100:1	Target = 10.53		1000.00	967.64		
813 > 269	40	5.399	5.390		53567	17	>100:1	10.53 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.789	5.775	1/0	702978	23	85:1	Target = 13.30		1000.00	968.70		
913 > 319	40	5.782	5.775		54438	22	>100:1	12.91 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.954	3.954	1	588429	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.460	1	525771	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.221	0	491422	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	480406	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.601	3.593	1	132911	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021042.d
Injection Date: 20-Aug-2021 22:58:13 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 30
Sample Info: ID CCV 1000_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	984.65	98.5	70 - 130
D 46 13C4_PFBA	612112	630167			102.9	50 - 150
D 50 13C5_PFPeA	629666	658952			104.7	50 - 150
21 PFPeA			1000.00	967.08	96.7	70 - 130
7 PFBS			884.00	858.06	97.1	70 - 130
D 44 13C3_PFBS	193652	201486			104	50 - 150
1 4:2 FTS			934.00	952.13	101.9	70 - 130
D 63 13C2_4:2 FTS_2	105591	111052			105.2	50 - 150
D 49 13C5_PFHxA	649325	690778			106.4	50 - 150
15 PFHxA			1000.00	983.94	98.4	70 - 130
22 PFPeS			938.00	923.81	98.5	70 - 130
28 GenX			2000.00	1913.93	95.7	70 - 130
D 66 13C3_GenX	1220862	1283413			105.1	50 - 150
D 47 13C4_PFHpA	573719	550518			96	50 - 150
13 PFHpA			1000.00	934.48	93.4	70 - 130
D 45 13C3_PFHxS	146711	153786			104.8	50 - 150
14 PFHxS			910.00	892.69	98.1	70 - 130
29 ADONA			942.00	906.05	96.2	70 - 130
2 6:2 FTS			948.00	887.23	93.6	70 - 130
D 64 13C2_6:2 FTS_2	96908	101535			104.8	50 - 150
D 53 13C8_PFOA	563802	606268			107.5	50 - 150
20 PFOA			1000.00	962.65	96.3	70 - 130
12 PFHpS			952.00	969.98	101.9	70 - 130
D 54 13C8_PFOS	149352	146774			98.3	50 - 150
18 PFOS			928.00	985.99	106.2	70 - 130
17 PFNA			1000.00	1038.34	103.8	70 - 130
D 56 13C9_PFNA	662557	665004			100.4	50 - 150
30 9Cl-PF3ONS			932.00	943.21	101.2	70 - 130
D 55 13C8_PFOSA	313093	316758			101.2	50 - 150
19 PFOSA			1000.00	1054.10	105.4	70 - 130
16 PFNS			960.00	990.96	103.2	70 - 130
D 65 13C2_8:2 FTS_2	110833	108731			98.1	50 - 150
10 PFDA			1000.00	1013.28	101.3	70 - 130
3 8:2 FTS			958.00	858.12	89.6	70 - 130
D 51 13C6_PFDA	663112	653587			98.6	50 - 150
D 58 d3-MeFOSAA	663389	682159			102.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1000.65	100.1	70 - 130
9 PFDS			964.00	1002.52	104	70 - 130
25 PFUdA			1000.00	1036.57	103.7	70 - 130
D 60 d5-EtFOSAA	633381	626163			98.9	50 - 150
D 52 13C7_PFUdA	681974	694245			101.8	50 - 150
5 N-EtFOSAA			1000.00	1009.03	100.9	70 - 130
D 61 d7-MeFOSE	103682	111294			107.3	50 - 150
D 57 d3-MeFOSA	48151	58320			121.1	50 - 150
32 MeFOSE			1000.00	957.28	95.7	70 - 130
26 MeFOSA			1000.00	976.55	97.7	70 - 130
31 11Cl-PF3OUDS			942.00	910.14	96.6	70 - 130
D 62 d9-EtFOSE	112837	122179			108.3	50 - 150
33 EtFOSE			1000.00	1036.03	103.6	70 - 130
D 59 d5-EtFOSA	50649	49176			97.1	50 - 150
27 EtFOSA			1000.00	1088.00	108.8	70 - 130
11 PFDoA			1000.00	1070.35	107	70 - 130
D 38 13C2_PFDoA	687538	688605			100.2	50 - 150
4 10:2 FTS			964.00	997.08	103.4	70 - 130
34 PFDOS			968.00	955.47	98.7	70 - 130
24 PFTrDA			1000.00	1055.00	105.5	70 - 130
D 42 13C2_PFTeDA	948336	971149			102.4	50 - 150
23 PFTeDA			1000.00	998.53	99.9	70 - 130
35 PFHxDA			1000.00	982.94	98.3	70 - 130
D 40 13C2_PFHxDA	930923	977932			105	50 - 150
36 PFODA			1000.00	942.83	94.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021042.d
Injection Date: 20-Aug-2021 22:58:13 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 30
Sample Info: ID CCV 1000_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.709	1.711	0	630167	20	>100:1			1000.00	1048.31	102.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.711	1/1	652675	20	>100:1			1000.00	984.65		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.083	2.077	1	658952	16	>100:1			1000.00	1060.59	104.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.083	2.088	0/-1	683971	15	>100:1			1000.00	967.08		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.136	2.141	0	201486	15	>100:1			1000.00	1067.30	104	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.136	2.141	0/0	225227	16	>100:1	Target = 3.41		884.00	858.06		
298.9 > 99	44	2.136	2.141		67776	15	>100:1	3.32 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.478	0/0	160305	17	>100:1	Target = 2.92		938.00	923.81		
349 > 99	44	2.477	2.478		57798	18	>100:1	2.77 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.407	0	111052	16	>100:1			5000.00	5348.77	105.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.407	0/0	44851	17	>100:1	Target = 1.58		934.00	952.13		
327 > 81	63	2.406	2.407		21881	17	>100:1	2.04 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.442	0	690778	17	>100:1			1000.00	1045.74	106.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.442	0/0	688549	18	>100:1	Target = 18.69		1000.00	983.94		
313 > 119	49	2.441	2.442		31742	16	>100:1	21.69 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.566	2.558	1	1283413	18	>100:1			5000.00	5433.96	105.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.557	2.558	0/-1	336767	18	>100:1	Target = 0.78		2000.00	1913.93		
285 > 185	66	2.566	2.558		438411	18	>100:1	0.76 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.818	1	550518	18	>100:1			1000.00	1027.15	96	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.826	2.818	1/0	574513	17	>100:1	Target = 3.75		1000.00	934.48		
363 > 169	47	2.826	2.818		160405	16	>100:1	3.58 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.836	0	153786	16	>100:1			1000.00	1080.41	104.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.836	0/0	150814	25	>100:1	Target = 2.79	0.18	910.00	892.69		
399 > 99	45	2.835	2.836		48373	22	>100:1	3.11 (1.39-4.19)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.864	0/0	976988	18	>100:1	Target = 3.21		942.00	906.05		
377 > 85	45	2.862	2.864		315317	18	>100:1	3.09 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.218	3.208	1/1	157002	20	>100:1	Target = 3.03		952.00	969.98		
449 > 99	45	3.218	3.208		54469	20	>100:1	2.88 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.185	3.181	1	101535	21	>100:1			5000.00	5622.40	104.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.185	3.174	1/0	45443	20	>100:1	Target = 1.94		948.00	887.23		
427 > 81	64	3.178	3.174		25201	17	>100:1	1.80 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.201	1	606268	20	>100:1			1000.00	1077.40	107.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.211	3.201	1/0	582367	20	>100:1	Target = 2.91		1000.00	962.65		
413 > 169	53	3.211	3.201		203536	20	>100:1	2.86 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.590	3.577	1	146774	20	>100:1			1000.00	1022.33	98.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.590	3.585	1/0	164992	36	>100:1	Target = 3.38	0.26	928.00	985.99		M
499 > 99	54	3.590	3.585		45094	33	>100:1	3.65 (1.69-5.07)	0.04				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.802	3.790	1/0	515432	19	>100:1			932.00	943.21		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.941	3.920	2/1	122937	16	>100:1	Target = 2.80		960.00	990.96		
549 > 99	54	3.933	3.920		43558	15	>100:1	2.82 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.250	4.237	1/0	121139	14	>100:1	Target = 3.15		964.00	1002.52		
599 > 99	54	4.250	4.237		40600	14		2.98 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.407	4.398	1/0	430782	17	>100:1			942.00	910.14		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.758	4.742	2/1	100955	19	>100:1	Target = 3.01		968.00	955.47		
699 > 99	54	4.758	4.742		34200	18	>100:1	2.95 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.590	3.585	1	665004	18	>100:1			1000.00	1006.90	100.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.590	3.585	1/0	738676	19	>100:1	Target = 6.48		1000.00	1038.34		
463 > 169	56	3.598	3.585		123119	20	>100:1	5.99 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.875	3.863	1	316758	19	>100:1			1000.00	1054.82	101.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.867	3.863	1/0	348767	18	>100:1	Target = 32.22		1000.00	1054.10		
498>478	55	3.875	3.863		9630	22	68:1	36.21 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.941	3.928	1	108731	17	>100:1			5000.00	5160.98	98.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.941	3.937	1/0	41436	16	>100:1	Target = 1.96		958.00	858.12		
527 > 81	65	3.941	3.937		22248	15	>100:1	1.86 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.556	4.535	2/1	63907	22	>100:1	Target = 3.34		964.00	997.08		
627 > 80	65	4.556	4.535		20115	17	>100:1	3.17 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.950	3.937	1	653587	18	>100:1			1000.00	1031.29	98.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.950	3.937	1/0	733195	18	>100:1	Target = 13.93		1000.00	1013.28		
513 > 169	51	3.950	3.937		53380	16	>100:1	13.73 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.109	4.098	1	682159	18	>100:1			5000.00	5089.17	102.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.109	4.107	1/0	110031	31	>100:1	Target = 1.31	0.10	1000.00	1000.65		M
570 > 483	58	4.109	4.107		89083	30	>100:1	1.23 (0.65-1.97)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.260	4.257	1	694245	17	>100:1			1000.00	1033.41	101.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.270	4.257	1/0	649527	16	>100:1	Target = 14.01		1000.00	1036.57		
563 > 169	52	4.270	4.257		46987	13	>100:1	13.82 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.270	4.257	1	626163	16	>100:1			5000.00	5187.66	98.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.270	4.267	1/0	130241	33	>100:1	Target = 1.75		1000.00	1009.03		M
584 > 526	60	4.270	4.267		78881	29	>100:1	1.65 (0.87-2.62)	0.31				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.300	4.287	1	111294	14	>100:1			1000.00	1063.85	107.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.311	4.308	1/0	120645	14	>100:1			1000.00	957.28		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.321	4.308	1	58320	14	>100:1			1000.00	1048.80	121.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.321	4.318	1/0	63221	13	>100:1	Target = 1.04		1000.00	976.55		
512 > 219	57	4.321	4.318		63280	13	>100:1	0.99 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.467	4.454	1	122179	14	>100:1			1000.00	1025.36	108.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.476	4.472	1/0	116530	23	>100:1			1000.00	1036.03		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.476	4.481	0	49176	14	>100:1			1000.00	963.96	97.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.494	4.481	1/1	61617	21	>100:1	Target = 1.05		1000.00	1088.00		
526 > 219	59	4.494	4.481		59575	15	>100:1	1.03 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.539	4.526	1	688605	17	>100:1			1000.00	1018.49	100.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.539	4.526	1/0	782891	16	>100:1	Target = 10.52		1000.00	1070.35		
613 > 169	38	4.539	4.526		68993	17	>100:1	11.34 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.785	4.769	1/0	658518	21	>100:1	Target = 7.51		1000.00	1055.00		
663 > 169	38	4.785	4.769		82348	21	>100:1	7.99 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.008	4.992	1	971149	21	>100:1			1000.00	1029.47	102.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.008	4.998	1/0	799591	21	>100:1	Target = 11.12		1000.00	998.53		
713 > 169	42	5.008	4.998		74333	20	>100:1	10.75 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.411	5.390	2	977932	19	>100:1			1000.00	1059.30	105	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.411	5.390	2/0	681706	19	>100:1	Target = 10.69		1000.00	982.94		
813 > 269	40	5.411	5.390		63303	18	>100:1	10.76 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.800	5.775	2/0	813413	26	72:1	Target = 13.29		1000.00	942.83		
913 > 319	40	5.793	5.775		61722	25	>100:1	13.17 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.950	3.937	1	750537	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.442	0	715437	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.201	1	622512	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.709	1.711	0	613737	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.590	3.577	1	155543	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021054.d
Injection Date: 21-Aug-2021 01:05:54 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 42
Sample Info: ID CCV 1000A_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1014.51	101.5	70 - 130
D 46 13C4_PFBA	612112	627791			102.6	50 - 150
D 50 13C5_PFPeA	629666	658008			104.5	50 - 150
21 PFPeA			1000.00	995.72	99.6	70 - 130
7 PFBS			884.00	917.40	103.8	70 - 130
D 44 13C3_PFBS	193652	196665			101.6	50 - 150
1 4:2 FTS			934.00	872.91	93.5	70 - 130
D 63 13C2_4:2 FTS_2	105591	119959			113.6	50 - 150
D 49 13C5_PFHxA	649325	684018			105.3	50 - 150
15 PFHxA			1000.00	989.33	98.9	70 - 130
22 PFPeS			938.00	936.79	99.9	70 - 130
28 GenX			2000.00	1937.02	96.9	70 - 130
D 66 13C3_GenX	1220862	1308633			107.2	50 - 150
D 47 13C4_PFHpA	573719	591508			103.1	50 - 150
13 PFHpA			1000.00	960.87	96.1	70 - 130
D 45 13C3_PFHxS	146711	157399			107.3	50 - 150
14 PFHxS			910.00	904.75	99.4	70 - 130
29 ADONA			942.00	921.32	97.8	70 - 130
2 6:2 FTS			948.00	943.57	99.5	70 - 130
D 64 13C2_6:2 FTS_2	96908	101666			104.9	50 - 150
D 53 13C8_PFOA	563802	590541			104.7	50 - 150
20 PFOA			1000.00	984.05	98.4	70 - 130
12 PFHpS			952.00	888.79	93.4	70 - 130
D 54 13C8_PFOS	149352	150279			100.6	50 - 150
18 PFOS			928.00	840.76	90.6	70 - 130
17 PFNA			1000.00	897.15	89.7	70 - 130
D 56 13C9_PFNA	662557	740685			111.8	50 - 150
30 9Cl-PF3ONS			932.00	936.12	100.4	70 - 130
D 55 13C8_PFOSA	313093	313935			100.3	50 - 150
19 PFOSA			1000.00	1014.98	101.5	70 - 130
16 PFNS			960.00	949.68	98.9	70 - 130
D 65 13C2_8:2 FTS_2	110833	117205			105.7	50 - 150
10 PFDA			1000.00	1069.47	106.9	70 - 130
3 8:2 FTS			958.00	887.72	92.7	70 - 130
D 51 13C6_PFDA	663112	664829			100.3	50 - 150
D 58 d3-MeFOSAA	663389	729181			109.9	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1061.37	106.1	70 - 130
9 PFDS			964.00	1028.93	106.7	70 - 130
25 PFUdA			1000.00	1035.95	103.6	70 - 130
D 60 d5-EtFOSAA	633381	684379			108.1	50 - 150
D 52 13C7_PFUdA	681974	728247			106.8	50 - 150
5 N-EtFOSAA			1000.00	952.42	95.2	70 - 130
D 61 d7-MeFOSE	103682	110041			106.1	50 - 150
D 57 d3-MeFOSA	48151	50773			105.4	50 - 150
32 MeFOSE			1000.00	957.10	95.7	70 - 130
26 MeFOSA			1000.00	1094.27	109.4	70 - 130
31 11Cl-PF3OUDS			942.00	930.04	98.7	70 - 130
D 62 d9-EtFOSE	112837	126130			111.8	50 - 150
33 EtFOSE			1000.00	1054.99	105.5	70 - 130
D 59 d5-EtFOSA	50649	50833			100.4	50 - 150
27 EtFOSA			1000.00	983.44	98.3	70 - 130
11 PFDoA			1000.00	1029.84	103	70 - 130
D 38 13C2_PFDoA	687538	723740			105.3	50 - 150
4 10:2 FTS			964.00	894.61	92.8	70 - 130
34 PFDOS			968.00	964.41	99.6	70 - 130
24 PFTrDA			1000.00	1045.62	104.6	70 - 130
D 42 13C2_PFTeDA	948336	956571			100.9	50 - 150
23 PFTeDA			1000.00	1055.05	105.5	70 - 130
35 PFHxDA			1000.00	972.01	97.2	70 - 130
D 40 13C2_PFHxDA	930923	993976			106.8	50 - 150
36 PFODA			1000.00	950.90	95.1	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021054.d
Injection Date: 21-Aug-2021 01:05:54 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 42
Sample Info: ID CCV 1000A_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.713	1.711	1	627791	19	>100:1			1000.00	1044.36	102.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.713	1.711	1/0	669935	20	>100:1			1000.00	1014.51		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.083	2.077	1	658008	17	>100:1			1000.00	1059.08	104.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.083	2.088	0/-1	703215	15	>100:1			1000.00	995.72		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.136	2.141	0	196665	15	>100:1			1000.00	1041.76	101.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.136	2.141	0/0	235042	15	>100:1	Target = 3.41		884.00	917.40		
298.9 > 99	44	2.136	2.141		67322	16	>100:1	3.49 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	0/0	158669	16	>100:1	Target = 2.92		938.00	936.79		
349 > 99	44	2.478	2.478		55301	16	>100:1	2.86 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.407	0	119959	16	>100:1			5000.00	5777.78	113.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.407	0/0	44417	19		Target = 1.58		934.00	872.91		
327 > 81	63	2.406	2.407		24843	15	>100:1	1.78 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	0	684018	17	>100:1			1000.00	1035.50	105.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	0/0	685542	18	>100:1	Target = 18.69		1000.00	989.33		
313 > 119	49	2.442	2.442		34487	17	>100:1	19.87 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1308633	17	>100:1			5000.00	5540.75	107.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.558	1/1	347452	17	>100:1	Target = 0.78		2000.00	1937.02		
285 > 185	66	2.558	2.558		464219	17	>100:1	0.74 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.819	2.818	1	591508	18	>100:1			1000.00	1103.62	103.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.819	2.818	1/0	634722	17	>100:1	Target = 3.75		1000.00	960.87		
363 > 169	47	2.819	2.818		176210	17	>100:1	3.60 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.837	2.836	1	157399	16	>100:1			1000.00	1105.80	107.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.837	2.836	1/0	156442	25	>100:1	Target = 2.79	0.17	910.00	904.75		
399 > 99	45	2.837	2.836		47655	25	>100:1	3.28 (1.39-4.19)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/0	1016800	18	>100:1	Target = 3.21		942.00	921.32		
377 > 85	45	2.864	2.864		306527	17	>100:1	3.31 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.215	3.208	1/0	147241	20	>100:1	Target = 3.03		952.00	888.79		
449 > 99	45	3.215	3.208		49456	20	>100:1	2.97 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.182	3.181	1	101666	21	>100:1			5000.00	5629.65	104.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.188	3.174	1/0	48391	21	>100:1	Target = 1.94		948.00	943.57		
427 > 81	64	3.188	3.174		22973	18	>100:1	2.10 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.215	3.201	1	590541	21	>100:1			1000.00	1049.45	104.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.201	1/0	579870	20	>100:1	Target = 2.91		1000.00	984.05		
413 > 169	53	3.208	3.201		211858	21	>100:1	2.73 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.587	3.577	1	150279	19	>100:1			1000.00	1046.74	100.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.595	3.585	1/0	144050	35	>100:1	Target = 3.38	0.26	928.00	840.76		
499 > 99	54	3.595	3.585		44668	34	>100:1	3.22 (1.69-5.07)	0.14				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.800	3.790	1/0	523776	19	>100:1			932.00	936.12		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.939	3.920	2/1	120630	18	>100:1	Target = 2.80		960.00	949.68		
549 > 99	54	3.939	3.920		41784	18		2.88 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.251	4.237	1/0	127300	17	>100:1	Target = 3.15		964.00	1028.93		
599 > 99	54	4.251	4.237		45731	14	>100:1	2.78 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.407	4.398	1/0	450716	16	>100:1			942.00	930.04		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.759	4.742	2/1	104333	20	>100:1	Target = 3.01		968.00	964.41		
699 > 99	54	4.759	4.742		35149	25		2.96 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.595	3.585	1	740685	19	>100:1			1000.00	1121.49	111.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.595	3.585	1/0	710872	19	>100:1	Target = 6.48		1000.00	897.15		
463 > 169	56	3.595	3.585		113632	18	>100:1	6.25 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.873	3.863	1	313935	18	>100:1			1000.00	1045.42	100.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.873	3.863	1/0	332831	17	>100:1	Target = 32.22		1000.00	1014.98		
498>478	55	3.881	3.863		8798	22	69:1	37.83 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.939	3.928	1	117205	23	>100:1			5000.00	5563.21	105.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.939	3.937	1/0	46206	22	>100:1	Target = 1.96		958.00	887.72		
527 > 81	65	3.939	3.937		26126	22	>100:1	1.76 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.556	4.535	2/1	61808	24	>100:1	Target = 3.34		964.00	894.61		
627 > 80	65	4.556	4.535		20739	16	>100:1	2.98 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.948	3.937	1	664829	17	>100:1			1000.00	1049.03	100.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.948	3.937	1/0	787164	18	>100:1	Target = 13.93		1000.00	1069.47		
513 > 169	51	3.948	3.937		60242	22	>100:1	13.06 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.110	4.098	1	729181	17	>100:1			5000.00	5439.97	109.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.110	4.107	1/0	124753	29	>100:1	Target = 1.31	0.09	1000.00	1061.37		M
570 > 483	58	4.119	4.107		79280	36	>100:1	1.57 (0.65-1.97)	0.27				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.261	4.257	1	728247	16				1000.00	1084.03	106.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.271	4.257	1/0	680933	17	>100:1	Target = 14.01		1000.00	1035.95		
563 > 169	52	4.271	4.257		40002	15	>100:1	17.02 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.271	4.257	1	684379	15	>100:1			5000.00	5669.97	108.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.271	4.267	1/0	134364	35	>100:1	Target = 1.75	0.07	1000.00	952.42		M
584 > 526	60	4.271	4.267		85359	27	>100:1	1.57 (0.87-2.62)	0.28				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.291	4.287	1	110041	17	>100:1			1000.00	1051.88	106.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.301	4.308	0/-1	119265	15	>100:1			1000.00	957.10		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.311	4.308	1	50773	15	79:1			1000.00	913.08	105.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.321	4.318	1/0	61675	13	>100:1	Target = 1.04		1000.00	1094.27		
512 > 219	57	4.321	4.318		59908	13	>100:1	1.02 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.458	4.454	1	126130	14	>100:1			1000.00	1058.52	111.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.476	4.472	1/0	122462	15	>100:1			1000.00	1054.99		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.485	4.481	1	50833	17	>100:1			1000.00	996.44	100.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.485	4.481	1/0	57572	21	>100:1	Target = 1.05		1000.00	983.44		
526 > 219	59	4.494	4.481		61139	15	>100:1	0.94 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.539	4.526	1	723740	18	>100:1			1000.00	1070.45	105.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.539	4.526	1/0	791701	17	>100:1	Target = 10.52		1000.00	1029.84		
613 > 169	38	4.539	4.526		69855	15	>100:1	11.33 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.785	4.769	2/1	685969	19	>100:1	Target = 7.51		1000.00	1045.62		
663 > 169	38	4.785	4.769		89613	20	>100:1	7.65 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.014	4.992	2	956571	20	>100:1			1000.00	1014.02	100.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.014	4.998	1/-1	832172	21	>100:1	Target = 11.12		1000.00	1055.05		
713 > 169	42	5.008	4.998		70724	21	>100:1	11.76 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.411	5.390	2	993976	18	>100:1			1000.00	1076.68	106.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.411	5.390	2/0	685181	19	>100:1	Target = 10.69		1000.00	972.01		
813 > 269	40	5.411	5.390		62277	19	>100:1	11.00 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.801	5.775	2/0	833835	26	70:1	Target = 13.29		1000.00	950.90		
913 > 319	40	5.801	5.775		64368	35	>100:1	12.95 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.948	3.937	1	812780	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	695366	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.201	1	634986	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.713	1.711	1	615461	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.587	3.577	1	161592	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021068.d
Injection Date: 21-Aug-2021 03:35:40 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 56
Sample Info: ID CCV 1000B_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	999.69	100	70 - 130
D 46 13C4_PFBA	612112	681437			111.3	50 - 150
D 50 13C5_PFPeA	629666	686731			109.1	50 - 150
21 PFPeA			1000.00	1023.53	102.4	70 - 130
7 PFBS			884.00	868.91	98.3	70 - 130
D 44 13C3_PFBS	193652	208008			107.4	50 - 150
1 4:2 FTS			934.00	913.39	97.8	70 - 130
D 63 13C2_4:2 FTS_2	105591	121748			115.3	50 - 150
D 49 13C5_PFHxA	649325	727913			112.1	50 - 150
15 PFHxA			1000.00	1093.87	109.4	70 - 130
22 PFPeS			938.00	1010.94	107.8	70 - 130
28 GenX			2000.00	1895.60	94.8	70 - 130
D 66 13C3_GenX	1220862	1413430			115.8	50 - 150
D 47 13C4_PFHpA	573719	624334			108.8	50 - 150
13 PFHpA			1000.00	943.94	94.4	70 - 130
D 45 13C3_PFHxS	146711	170267			116.1	50 - 150
14 PFHxS			910.00	920.78	101.2	70 - 130
29 ADONA			942.00	903.47	95.9	70 - 130
2 6:2 FTS			948.00	913.62	96.4	70 - 130
D 64 13C2_6:2 FTS_2	96908	106868			110.3	50 - 150
D 53 13C8_PFOA	563802	642009			113.9	50 - 150
20 PFOA			1000.00	994.76	99.5	70 - 130
12 PFHpS			952.00	926.10	97.3	70 - 130
D 54 13C8_PFOS	149352	174340			116.7	50 - 150
18 PFOS			928.00	821.24	88.5	70 - 130
17 PFNA			1000.00	994.14	99.4	70 - 130
D 56 13C9_PFNA	662557	768739			116	50 - 150
30 9Cl-PF3ONS			932.00	890.07	95.5	70 - 130
D 55 13C8_PFOSA	313093	359825			114.9	50 - 150
19 PFOSA			1000.00	924.40	92.4	70 - 130
16 PFNS			960.00	920.32	95.9	70 - 130
D 65 13C2_8:2 FTS_2	110833	123294			111.2	50 - 150
10 PFDA			1000.00	927.29	92.7	70 - 130
3 8:2 FTS			958.00	992.00	103.5	70 - 130
D 51 13C6_PFDA	663112	770479			116.2	50 - 150
D 58 d3-MeFOSAA	663389	792854			119.5	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1087.36	108.7	70 - 130
9 PFDS			964.00	971.16	100.7	70 - 130
25 PFUdA			1000.00	1034.08	103.4	70 - 130
D 60 d5-EtFOSAA	633381	724411			114.4	50 - 150
D 52 13C7_PFUdA	681974	810094			118.8	50 - 150
5 N-EtFOSAA			1000.00	945.17	94.5	70 - 130
D 61 d7-MeFOSE	103682	115171			111.1	50 - 150
D 57 d3-MeFOSA	48151	65149			135.3	50 - 150
32 MeFOSE			1000.00	1024.54	102.5	70 - 130
26 MeFOSA			1000.00	849.83	85	70 - 130
31 11Cl-PF3OUDS			942.00	864.88	91.8	70 - 130
D 62 d9-EtFOSE	112837	133361			118.2	50 - 150
33 EtFOSE			1000.00	1036.83	103.7	70 - 130
D 59 d5-EtFOSA	50649	56746			112	50 - 150
27 EtFOSA			1000.00	1045.90	104.6	70 - 130
11 PFDoA			1000.00	913.69	91.4	70 - 130
D 38 13C2_PFDoA	687538	827656			120.4	50 - 150
4 10:2 FTS			964.00	999.79	103.7	70 - 130
34 PFDOS			968.00	879.66	90.9	70 - 130
24 PFTrDA			1000.00	968.24	96.8	70 - 130
D 42 13C2_PFTeDA	948336	1053376			111.1	50 - 150
23 PFTeDA			1000.00	999.41	99.9	70 - 130
35 PFHxDA			1000.00	974.33	97.4	70 - 130
D 40 13C2_PFHxDA	930923	1071697			115.1	50 - 150
36 PFODA			1000.00	963.15	96.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021068.d
Injection Date: 21-Aug-2021 03:35:40 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 56
Sample Info: ID CCV 1000B_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	681437	20	>100:1			1000.00	1133.60	111.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.711	1/1	716556	20	>100:1			1000.00	999.69		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	686731	17	>100:1			1000.00	1105.31	109.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	754409	15	>100:1			1000.00	1023.53		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	208008	15	>100:1			1000.00	1101.84	107.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	235457	15	>100:1	Target = 3.41		884.00	868.91		
298.9 > 99	44	2.141	2.141		74065	14	>100:1	3.17 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	181104	17	>100:1	Target = 2.92		938.00	1010.94		
349 > 99	44	2.478	2.478		59949	16	>100:1	3.02 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	121748	18	>100:1			5000.00	5863.94	115.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	47170	17	>100:1	Target = 1.58		934.00	913.39		
327 > 81	63	2.407	2.407		26152	15	>100:1	1.80 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.442	1	727913	17	>100:1			1000.00	1101.95	112.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	1/0	806622	17	>100:1	Target = 18.69		1000.00	1093.87		
313 > 119	49	2.442	2.442		40030	18	>100:1	20.15 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.567	2.558	1	1413430	18	>100:1			5000.00	5984.45	115.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	1/0	367395	17	>100:1	Target = 0.78		2000.00	1895.60		
285 > 185	66	2.558	2.558		494369	19	>100:1	0.74 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	624334	16	>100:1			1000.00	1164.87	108.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.827	2.818	1/0	658143	17	>100:1	Target = 3.75		1000.00	943.94		
363 > 169	47	2.818	2.818		179669	16	>100:1	3.66 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	170267	17	>100:1			1000.00	1196.20	116.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/0	172230	25	>100:1	Target = 2.79	0.17	910.00	920.78		
399 > 99	45	2.836	2.836		55648	25	>100:1	3.09 (1.39-4.19)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/0	1078612	17	>100:1	Target = 3.21		942.00	903.47		
377 > 85	45	2.864	2.864		341610	18	>100:1	3.15 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.213	3.208	1/0	165965	19	>100:1	Target = 3.03		952.00	926.10		
449 > 99	45	3.213	3.208		54120	21	>100:1	3.06 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.187	3.181	1	106868	19	>100:1			5000.00	5917.71	110.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.187	3.174	1/0	49252	20	>100:1	Target = 1.94		948.00	913.62		
427 > 81	64	3.180	3.174		21095	19	>100:1	2.33 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.207	3.201	1	642009	21	>100:1			1000.00	1140.91	113.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.207	3.201	1/0	637272	21	>100:1	Target = 2.91		1000.00	994.76		
413 > 169	53	3.207	3.201		216713	21	>100:1	2.94 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.584	3.577	1	174340	18	>100:1			1000.00	1214.33	116.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.584	3.585	0/-1	163234	35	>100:1	Target = 3.38	0.30	928.00	821.24		
499 > 99	54	3.592	3.585		47485	36	>100:1	3.43 (1.69-5.07)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.796	3.790	1/0	577745	18	>100:1			932.00	890.07		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.935	3.920	1/0	135617	17	>100:1	Target = 2.80		960.00	920.32		
549 > 99	54	3.935	3.920		49077	18	>100:1	2.76 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.245	4.237	1/0	139390	15	>100:1	Target = 3.15		964.00	971.16		
599 > 99	54	4.245	4.237		51291	20	>100:1	2.71 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.403	4.398	1/0	486245	16	>100:1			942.00	864.88		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.753	4.742	1/0	110401	18	>100:1	Target = 3.01		968.00	879.66		
699 > 99	54	4.753	4.742		38555	18	>100:1	2.86 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.592	3.585	1	768739	20	>100:1			1000.00	1163.97	116	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.592	3.585	1/0	817552	18	>100:1	Target = 6.48		1000.00	994.14		
463 > 169	56	3.600	3.585		125064	19	>100:1	6.53 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.861	3.863	0	359825	19	>100:1			1000.00	1198.24	114.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.869	3.863	1/1	347441	17	>100:1	Target = 32.22		1000.00	924.40		
498>478	55	3.861	3.863		12023	22		28.89 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.935	3.928	1	123294	18				5000.00	5852.23	111.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.935	3.937	0/-1	54316	18	>100:1	Target = 1.96		958.00	992.00		
527 > 81	65	3.943	3.937		29984	18		1.81 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.550	4.535	1/0	72663	19	>100:1	Target = 3.34		964.00	999.79		
627 > 80	65	4.550	4.535		19739	17	>100:1	3.68 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.943	3.937	1	770479	18	>100:1			1000.00	1215.73	116.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.943	3.937	1/0	790974	17	>100:1	Target = 13.93		1000.00	927.29		
513 > 169	51	3.943	3.937		57811	23	>100:1	13.68 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.105	4.098	1	792854	18	>100:1			5000.00	5915.00	119.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.105	4.107	0/-1	138968	32	>100:1	Target = 1.31		1000.00	1087.36		M
570 > 483	58	4.105	4.107		92630	30	>100:1	1.50 (0.65-1.97)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.265	4.257	1	810094	15	>100:1			1000.00	1205.86	118.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.265	4.257	1/0	756094	15	>100:1	Target = 14.01		1000.00	1034.08		
563 > 169	52	4.265	4.257		50774	14	>100:1	14.89 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.265	4.257	1	724411	15	>100:1			5000.00	6001.63	114.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.265	4.267	0/-1	141141	36		Target = 1.75	0.08	1000.00	945.17		M
584 > 526	60	4.265	4.267		94780	29	>100:1	1.48 (0.87-2.62)	0.10				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.285	4.287	0	115171	13	>100:1			1000.00	1100.91	111.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.295	4.308	0/0	133621	13	>100:1			1000.00	1024.54		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.306	4.308	0	65149	13	>100:1			1000.00	1171.61	135.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.316	4.318	0/0	61460	15	>100:1	Target = 1.04		1000.00	849.83		
512 > 219	57	4.316	4.318		65360	15	>100:1	0.94 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.452	4.454	0	133361	16	>100:1			1000.00	1119.20	118.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.470	4.472	0/0	127292	15	>100:1			1000.00	1036.83		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.470	4.481	0	56746	17	>100:1			1000.00	1112.35	112	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.479	4.481	0/0	68351	14	>100:1	Target = 1.05		1000.00	1045.90		
526 > 219	59	4.479	4.481		61901	14	>100:1	1.10 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.542	4.526	1	827656	16	>100:1			1000.00	1224.15	120.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.542	4.526	1/0	803261	16	>100:1	Target = 10.52		1000.00	913.69		
613 > 169	38	4.542	4.526		82134	16	>100:1	9.77 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.786	4.769	2/1	726403	21	>100:1	Target = 7.51		1000.00	968.24		
663 > 169	38	4.786	4.769		100217	18	>100:1	7.24 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.003	4.992	1	1053376	21	>100:1			1000.00	1116.64	111.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.003	4.998	1/0	868057	21	>100:1	Target = 11.12		1000.00	999.41		
713 > 169	42	5.003	4.998		79021	20	>100:1	10.98 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.412	5.390	2	1071697	18	>100:1			1000.00	1160.87	115.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.412	5.390	2/0	740520	18	>100:1	Target = 10.69		1000.00	974.33		
813 > 269	40	5.412	5.390		66169	19	>100:1	11.19 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.801	5.775	2/0	910622	25	73:1	Target = 13.29		1000.00	963.15		
913 > 319	40	5.801	5.775		65020	25	>100:1	14.00 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.943	3.937	1	904625	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.442	1	766514	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.213	3.201	1	684478	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	666874	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.592	3.577	1	174901	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021081.d
Injection Date: 21-Aug-2021 05:54:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 69
Sample Info: ID CCV 1000C_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	997.56	99.8	70 - 130
D 46 13C4_PFBA	612112	664725			108.6	50 - 150
D 50 13C5_PFPeA	629666	682445			108.4	50 - 150
21 PFPeA			1000.00	983.40	98.3	70 - 130
7 PFBS			884.00	883.15	99.9	70 - 130
D 44 13C3_PFBS	193652	209015			107.9	50 - 150
1 4:2 FTS			934.00	936.11	100.2	70 - 130
D 63 13C2_4:2 FTS_2	105591	115295			109.2	50 - 150
D 49 13C5_PFHxA	649325	725960			111.8	50 - 150
15 PFHxA			1000.00	1046.46	104.6	70 - 130
22 PFPeS			938.00	951.22	101.4	70 - 130
28 GenX			2000.00	2068.43	103.4	70 - 130
D 66 13C3_GenX	1220862	1299297			106.4	50 - 150
D 47 13C4_PFHpA	573719	607962			106	50 - 150
13 PFHpA			1000.00	969.71	97	70 - 130
D 45 13C3_PFHxS	146711	157958			107.7	50 - 150
14 PFHxS			910.00	896.89	98.6	70 - 130
29 ADONA			942.00	940.28	99.8	70 - 130
2 6:2 FTS			948.00	894.51	94.4	70 - 130
D 64 13C2_6:2 FTS_2	96908	104995			108.3	50 - 150
D 53 13C8_PFOA	563802	624543			110.8	50 - 150
20 PFOA			1000.00	1026.40	102.6	70 - 130
12 PFHpS			952.00	907.05	95.3	70 - 130
D 54 13C8_PFOS	149352	158208			105.9	50 - 150
18 PFOS			928.00	902.79	97.3	70 - 130
17 PFNA			1000.00	978.05	97.8	70 - 130
D 56 13C9_PFNA	662557	729270			110.1	50 - 150
30 9Cl-PF3ONS			932.00	931.93	100	70 - 130
D 55 13C8_PFOSA	313093	352413			112.6	50 - 150
19 PFOSA			1000.00	899.75	90	70 - 130
16 PFNS			960.00	891.65	92.9	70 - 130
D 65 13C2_8:2 FTS_2	110833	121704			109.8	50 - 150
10 PFDA			1000.00	1108.35	110.8	70 - 130
3 8:2 FTS			958.00	832.13	86.9	70 - 130
D 51 13C6_PFDA	663112	669021			100.9	50 - 150
D 58 d3-MeFOSAA	663389	770788			116.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1000.53	100.1	70 - 130
9 PFDS			964.00	980.63	101.7	70 - 130
25 PFUdA			1000.00	958.38	95.8	70 - 130
D 60 d5-EtFOSAA	633381	720483			113.8	50 - 150
D 52 13C7_PFUdA	681974	728866			106.9	50 - 150
5 N-EtFOSAA			1000.00	915.02	91.5	70 - 130
D 61 d7-MeFOSE	103682	111537			107.6	50 - 150
D 57 d3-MeFOSA	48151	61988			128.7	50 - 150
32 MeFOSE			1000.00	947.01	94.7	70 - 130
26 MeFOSA			1000.00	899.20	89.9	70 - 130
31 11Cl-PF3OUDS			942.00	875.79	93	70 - 130
D 62 d9-EtFOSE	112837	125899			111.6	50 - 150
33 EtFOSE			1000.00	978.65	97.9	70 - 130
D 59 d5-EtFOSA	50649	55750			110.1	50 - 150
27 EtFOSA			1000.00	901.31	90.1	70 - 130
11 PFDoA			1000.00	1102.55	110.3	70 - 130
D 38 13C2_PFDoA	687538	715961			104.1	50 - 150
4 10:2 FTS			964.00	906.47	94	70 - 130
34 PFDOS			968.00	934.02	96.5	70 - 130
24 PFTrDA			1000.00	1069.25	106.9	70 - 130
D 42 13C2_PFTeDA	948336	995738			105	50 - 150
23 PFTeDA			1000.00	1019.83	102	70 - 130
35 PFHxDA			1000.00	956.57	95.7	70 - 130
D 40 13C2_PFHxDA	930923	1037028			111.4	50 - 150
36 PFODA			1000.00	959.91	96	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021081.d
Injection Date: 21-Aug-2021 05:54:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 69
Sample Info: ID CCV 1000C_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.711	1	664725	20	>100:1			1000.00	1105.80	108.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.711	1/0	697495	19	>100:1			1000.00	997.56		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	682445	16	>100:1			1000.00	1098.41	108.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	720312	15	>100:1			1000.00	983.40		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	209015	16	>100:1			1000.00	1107.18	107.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	240476	13	>100:1	Target = 3.41		884.00	883.15		
298.9 > 99	44	2.141	2.141		66007	14	>100:1	3.64 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	171230	17	>100:1	Target = 2.92		938.00	951.22		
349 > 99	44	2.478	2.478		56364	18	>100:1	3.03 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	115295	16	>100:1			5000.00	5553.14	109.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.407	1/0	45781	15	>100:1	Target = 1.58		934.00	936.11		
327 > 81	63	2.407	2.407		26888	16	>100:1	1.70 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.443	2.442	1	725960	16	>100:1			1000.00	1099.00	111.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.451	2.442	1/0	769590	17	>100:1	Target = 18.69		1000.00	1046.46		
313 > 119	49	2.451	2.442		41013	16	>100:1	18.76 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.567	2.558	1	1299297	18	>100:1			5000.00	5501.22	106.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.558	1/0	367959	18	>100:1	Target = 0.78		2000.00	2068.43		
285 > 185	66	2.567	2.558		460869	19	>100:1	0.79 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.818	1	607962	17	>100:1			1000.00	1134.32	106	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.827	2.818	1/0	658385	17	>100:1	Target = 3.75		1000.00	969.71		
363 > 169	47	2.827	2.818		172864	17	>100:1	3.80 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	157958	17	>100:1			1000.00	1109.72	107.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/0	155634	25	>100:1	Target = 2.79	0.17	910.00	896.89		
399 > 99	45	2.836	2.836		56661	25	>100:1	2.74 (1.39-4.19)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/0	1041408	17	>100:1	Target = 3.21		942.00	940.28		
377 > 85	45	2.864	2.864		303169	17	>100:1	3.43 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.214	3.208	1/0	150800	19	>100:1	Target = 3.03		952.00	907.05		
449 > 99	45	3.214	3.208		54405	20	>100:1	2.77 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.188	3.181	1	104995	21	>100:1			5000.00	5813.99	108.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.188	3.174	1/0	47377	20	>100:1	Target = 1.94		948.00	894.51		
427 > 81	64	3.181	3.174		24436	19	>100:1	1.93 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.201	1	624543	21	>100:1			1000.00	1109.87	110.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.214	3.201	1/0	639654	21	>100:1	Target = 2.91		1000.00	1026.40		
413 > 169	53	3.214	3.201		199910	21	>100:1	3.19 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	158208	24	>100:1			1000.00	1101.97	105.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	1/0	162838	38	>100:1	Target = 3.38	0.26	928.00	902.79		M
499 > 99	54	3.585	3.585		51505	32	>100:1	3.16 (1.69-5.07)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.799	3.790	1/0	548945	20	>100:1			932.00	931.93		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.937	3.920	2/1	119234	16	>100:1	Target = 2.80		960.00	891.65		
549 > 99	54	3.937	3.920		43416	15	>100:1	2.74 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.248	4.237	1/0	127725	17	>100:1	Target = 3.15		964.00	980.63		
599 > 99	54	4.248	4.237		46633	14	>100:1	2.73 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.406	4.398	1/0	446815	17	>100:1			942.00	875.79		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.755	4.742	1/0	106377	19	>100:1	Target = 3.01		968.00	934.02		
699 > 99	54	4.755	4.742		33907	27	>100:1	3.13 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.593	3.585	1	729270	19	>100:1			1000.00	1104.21	110.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.601	3.585	1/0	763026	19	>100:1	Target = 6.48		1000.00	978.05		
463 > 169	56	3.593	3.585		124069	20	>100:1	6.15 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.863	1	352413	17	>100:1			1000.00	1173.55	112.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.863	1/0	331210	18	>100:1	Target = 32.22		1000.00	899.75		
498>478	55	3.863	3.863		11759	20	>100:1	28.16 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.928	1	121704	16	>100:1			5000.00	5776.76	109.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.937	1/0	44975	22	>100:1	Target = 1.96		958.00	832.13		
527 > 81	65	3.946	3.937		30964	18	>100:1	1.45 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.553	4.535	2/1	65031	15		Target = 3.34		964.00	906.47		
627 > 80	65	4.553	4.535		21284	15	>100:1	3.05 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.946	3.937	1	669021	18	>100:1			1000.00	1055.64	100.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.946	3.937	1/0	820924	18	>100:1	Target = 13.93		1000.00	1108.35		
513 > 169	51	3.946	3.937		55846	16	>100:1	14.69 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.098	1	770788	17	>100:1			5000.00	5750.38	116.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	1/0	124312	31	>100:1	Target = 1.31	0.08	1000.00	1000.53		M
570 > 483	58	4.116	4.107		94375	31	>100:1	1.31 (0.65-1.97)	0.15				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.268	4.257	1	728866	15	>100:1			1000.00	1084.95	106.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.258	4.257	1/0	630481	16	>100:1	Target = 14.01		1000.00	958.38		
563 > 169	52	4.268	4.257		48080	24	>100:1	13.11 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.268	4.257	1	720483	17	>100:1			5000.00	5969.08	113.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.268	4.267	1/0	135898	33	>100:1	Target = 1.75		1000.00	915.02		M
584 > 526	60	4.268	4.267		83509	29	>100:1	1.62 (0.87-2.62)	0.19				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.288	4.287	1	111537	12	>100:1			1000.00	1066.18	107.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.298	4.308	0/-1	119612	14	>100:1			1000.00	947.01		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.308	4.308	1	61988	13	>100:1			1000.00	1114.77	128.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.308	4.318	0/-1	61875	13	>100:1	Target = 1.04		1000.00	899.20		
512 > 219	57	4.308	4.318		68261	13	>100:1	0.90 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.455	4.454	1	125899	16	>100:1			1000.00	1056.58	111.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.464	4.472	0/-1	113542	16	>100:1			1000.00	978.65		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.473	4.481	0	55750	16	>100:1			1000.00	1092.83	110.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.482	4.481	1/1	57868	14	>100:1	Target = 1.05		1000.00	901.31		
526 > 219	59	4.482	4.481		58942	15	>100:1	0.98 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.545	4.526	2	715961	16	>100:1			1000.00	1058.95	104.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.545	4.526	2/0	838485	16	>100:1	Target = 10.52		1000.00	1102.55		
613 > 169	38	4.545	4.526		73736	16	>100:1	11.37 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.788	4.769	2/0	693931	20	>100:1	Target = 7.51		1000.00	1069.25		
663 > 169	38	4.788	4.769		88775	20	>100:1	7.81 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.010	4.992	2	995738	22	>100:1			1000.00	1055.54	105	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.010	4.998	1/-1	837330	21	>100:1	Target = 11.12		1000.00	1019.83		
713 > 169	42	5.010	4.998		73543	20	>100:1	11.38 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.416	5.390	2	1037028	19	>100:1			1000.00	1123.32	111.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.416	5.390	2/0	703503	19	>100:1	Target = 10.69		1000.00	956.57		
813 > 269	40	5.416	5.390		63631	19	>100:1	11.05 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.810	5.775	3/1	878200	27	75:1	Target = 13.29		1000.00	959.91		
913 > 319	40	5.810	5.775		61409	26	>100:1	14.30 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.946	3.937	1	869936	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.442	1	750008	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.201	1	674408	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	1	653239	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	158504	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\081321A-DOD.b\081321A05.d		
Injection Date:	13-Aug-2021 17:21:04	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	96
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.730	1.724	1	647833	21	>100:1			1001.00	1166.37	118.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.731		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.119	2.120	0	585125	17	>100:1			1001.00	1124.08	114.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.120		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.171	2.172	0	196839	16	>100:1			1001.00	1097.22	118.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.172		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.523		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.450	2.451	0	116551	17	>100:1			5005.00	5833.27	117.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.451		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.486	2.487	0	705923	17	>100:1			1001.00	1206.91	119	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.487		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.605	2.614	0	1332350	19	>100:1			5005.00	6187.84	116	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.614		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.872	2.873	0	579800	18	>100:1			1001.00	1198.60	123.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.873		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.887	2.888	0	154085	17	>100:1			1001.00	1147.53	121.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.888		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.912		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.276		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.239	3.241	0	108298	23	>100:1			5005.00	6711.87	121.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.232	3.241	0/0	2132	24		Target = 1.85		40.531	40.531		
427 > 81	64	3.239	3.241		870	19	17:1	2.45 (0.92-2.78)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.259	3.269	0	576904	29	>100:1			1001.00	1238.51	125.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.262		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.643	3.651	0	150584	22	>100:1			1001.00	1131.94	109.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.651		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.854		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		4.005		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.297		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.472		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.826		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.649	3.657	0	683148	22	>100:1			1001.00	1199.07	112.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.657		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.901	3.904	0	302860	18	>100:1			1001.00	1109.75	112.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.895		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		4.001	4.005	0	128239	16				5005.00	6711.91	123.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.995		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.619		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		4.001	4.016	0	640545	16	>100:1			1001.00	1173.50	114.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		4.016		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.164	4.169	0	832738	18	>100:1			5005.00	6656.85	114.3	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.169		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.322	4.328	0	691870	15	>100:1			1001.00	1167.64	112.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.328		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.322	4.328	0	688939	17	>100:1			5005.00	6194.95	113.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.338		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.312	4.308	1	94274	14	>100:1			1001.00	1131.13	108.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.328		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.332	4.328	1	55540	16	>100:1			1001.00	1101.87	112.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.347		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.477	4.472	1	103787	13	>100:1			1001.00	1109.24	121.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.490		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.504	4.499	1	51123	16	>100:1			1001.00	1156.12	112.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.508		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.599	4.611	0	680067	17	>100:1			1001.00	1165.93	115.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.611		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.859		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.073	5.087	0	902740	22	>100:1			1001.00	1009.18	119.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		5.087		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.493	5.516	-1	929588	22	>100:1			1001.00	1111.87	118.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.493	5.516	-1/0	5857	16	15:1	Target = 10.09		9.0859	9.0859		
813 > 269	40	5.500	5.516		854	18	12:1	6.85 (5.04-15.13)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.947		ND								
*** 37 13C2_PFDA**													
515 > 470		4.011	4.016	0	626234	16	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.486	2.496	0	600711	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.266	3.269	0	507852	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.730	1.731	0	506361	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.643	3.651	0	140296	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\081421-DOD.b\081421008.d		
Injection Date:	14-Aug-2021 13:43:45	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	98
Lab Sample ID:	ID IBLK B	Lab Prep. Batch:	
Sample Info:	ID IBLK B	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	631529	20	>100:1			1001.00	1137.01	119.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.718		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	0	599201	17	>100:1			1001.00	1151.13	118.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.098		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	0	208734	15	>100:1			1001.00	1163.53	119.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.151		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.496		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.424	2.415	1	108748	18	>100:1			5005.00	5442.73	112.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.424		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.460	1	672481	18	>100:1			1001.00	1149.74	118.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.460		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.575	0	1259828	17	>100:1			5005.00	5851.03	120.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.575		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.836	0	570135	18	>100:1			1001.00	1178.62	131	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.836		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.845	1	157810	19	>100:1			1001.00	1175.27	128.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.845		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.873		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.221		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.194	3.194	1	108661	26	>100:1			5005.00	6734.37	128.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.201		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.214	3.221	0	563410	22	>100:1			1001.00	1209.54	119.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.214		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.593	3.593	1	149858	18	>100:1			1001.00	1126.48	123.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.601		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.806		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.945		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.247		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.405		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.748		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.601	3.601	1	631026	20	>100:1			1001.00	1107.59	118.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.601		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.895	3.895	0	307095	18	>100:1			1001.00	1125.27	116.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.895		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.945	3.937	1	96306	17	>100:1			5005.00	5040.56	115.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.945		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.552		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.954	3.945	1	636688	18	>100:1			1001.00	1166.44	118.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.954		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.107	1	817192	18	>100:1			5005.00	6532.58	119.7	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.115		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.267	4.267	1	651739	17	>100:1			1001.00	1099.91	123.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.267		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.267	4.267	1	725042	17	>100:1			5005.00	6519.58	112	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.267		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.318	1	98137	14	>100:1			1001.00	1177.48	123.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.328		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.338	1	58075	15	>100:1			1001.00	1152.16	112.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.347		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.481	0	106110	16	>100:1			1001.00	1134.07	114.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.499		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.508	4.508	0	54733	15	>100:1			1001.00	1237.76	127.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.517		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.535	0	619608	16	>100:1			1001.00	1062.28	114.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.535		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.775		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.998	0	951755	20	>100:1			1001.00	1063.97	115.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.998		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.390	0	959918	18	>100:1			1001.00	1148.15	115.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.390	5.390	0/0	7646	17	25:1	Target = 10.09		11.486	11.486		
813 > 269	40	5.390	5.390		786	16	11:1	9.72 (5.04-15.13)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.775		ND								
*** 37 13C2_PFDA**													
515 > 470		3.954	3.954	1	622652	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.460	1	554136	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.214	3.221	0	469897	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	490070	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.593	3.593	1	123095	16	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021026.d		
Injection Date:	20-Aug-2021 20:08:11	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	14
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	592192	21	>100:1			1001.00	985.14	96.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	4991	19	3.0:1			8.0205	8.0205		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	618316	15	>100:1			1001.00	995.19	98.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	0	187083	14	>100:1			1001.00	991.00	96.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.141		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.478		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	0	109612	16	>100:1			5005.00	5279.42	103.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.407		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	0	666543	17	>100:1			1001.00	1009.05	102.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.442		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1192149	16	>100:1			5005.00	5047.55	97.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.558		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	533552	18	>100:1			1001.00	995.49	93	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.818		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	145850	17	>100:1			1001.00	1024.66	99.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.836		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.864		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.208		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.181	0	85682	20	>100:1			5005.00	4744.55	88.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.174		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.207	3.201	1	571104	21	>100:1			1001.00	1014.91	101.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.201		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	147227	22	>100:1			1001.00	1025.48	98.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.585		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.790		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.920		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.237		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.398		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.742		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.593	3.585	1	695614	18	>100:1			1001.00	1053.25	105	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.585		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.863	1	309405	18	>100:1			1001.00	1030.34	98.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.863		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.928	1	118463	17	>100:1			5005.00	5622.92	106.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.937		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.535		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.945	3.937	1	635078	18	>100:1			1001.00	1002.08	95.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.937		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.098	1	644544	18	>100:1			5005.00	4808.55	97.2	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.098	4.107	0/-1	1661	14	8.8:1	Target = 1.31		16.003	16.003		M
570 > 483	58	4.098	4.107		1388	18	13:1	1.19 (0.65-1.96)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.257	0	700670	16	>100:1			1001.00	1042.98	102.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.257		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.257	4.257	0	686836	17	>100:1			5005.00	5690.32	108.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	0/0	2436	28	9.3:1	Target = 1.61	0.19	17.223	17.223		M
584 > 526	60	4.287	4.267		1294	26	4.2:1	1.88 (0.80-2.42)	0.90				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.297	4.287	1	102644	14	>100:1			1001.00	981.17	99	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.308		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.308	1	53006	21	>100:1			1001.00	953.24	110.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.318		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.463	4.454	1	119040	16	>100:1			1001.00	999.01	105.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.472		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.481	0	51601	16	>100:1			1001.00	1011.50	101.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.481		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.526	1	680939	16				1001.00	1007.15	99	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.526		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.769		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.992	1	910238	21	>100:1			1001.00	964.90	96	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.998		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.390	1	1004858	19	>100:1			1001.00	1088.47	107.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.407	5.390	2/1	8998	16	14:1	Target = 10.66		12.639	12.639		
813 > 269	40	5.390	5.390		780	12	8.7:1	11.53 (5.33-16.00)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.782	5.775	1/0	2949	14	4.4:1	Target = 13.56		3.3299	3.3299		
913 > 319	40	5.782	5.775		270	17	3.1:1	10.92 (6.78-20.35)					
*** 37 13C2_PFDA**													
515 > 470		3.945	3.937	1	774427	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.442	1	711554	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.207	3.201	1	621865	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	604082	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	163745	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit
M - Compound Hit/Peak Manually Integrated

Report Date: 24-Aug-2021 09:38:32 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58	080521006.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34	080521007.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09	080521008.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48	080521009.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22	080521010.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58	080521011.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33	080521012.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14	080521013.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51	080521014.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31	080521015.d	ICal					Analytes	L-10	1.00		
11	ID IBLK A	05-Aug-2021 14:50:11	080521016.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1590	05-Aug-2021 15:00:44	080521017.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK_SVLC-1562	05-Aug-2021 15:11:18	080521018.d	CheckStd					IsomerCheck	Smp	1.00		
14	ID IBLK B	05-Aug-2021 15:21:52	080521019.d	InstBlk					Surrogates	Smp	0.1100		
15	WQ10751-001	05-Aug-2021 15:32:30	080521020.d	Client		Soil	1	10751	Surrogates	Smp	0.1100		
16	WQ10751-002	05-Aug-2021 15:43:10	080521021.d	LCS		Soil	1	10751	Analytes	100x PDS	0.1000		
17	WQ10751-003	05-Aug-2021 15:53:47	080521022.d	LCSD		Soil	1	10751	Analytes	100x PDS	0.1000		
18	WG26022-001	05-Aug-2021 16:04:23	080521023.d	Client	OK-2	Soil	1	10751	Surrogates	Smp	0.1100		RR-100X
19	WG26022-002	05-Aug-2021 16:15:00	080521024.d	Client	OK-2A	Soil	1	10751	Surrogates	Smp	0.1100		
20	WG26022-003	05-Aug-2021 16:25:41	080521025.d	Client	OK-2B	Soil	1	10751	Surrogates	Smp	0.1100		
21	WG26022-004	05-Aug-2021 16:36:20	080521026.d	Client	OK-2C	Soil	1	10751	Surrogates	Smp	0.1100		
22	WG26023-001	05-Aug-2021 16:46:57	080521027.d	Client	OK-3	Soil	1	10751	Surrogates	Smp	0.1100		RR-100X
23	WG26023-002	05-Aug-2021 16:57:33	080521028.d	Client	OK-3A	Soil	1	10751	Surrogates	Smp	0.1100		
24	WG26023-003	05-Aug-2021 17:08:12	080521029.d	Client	OK-3B	Soil	1	10751	Surrogates	Smp	0.1100		
25	WG26023-004	05-Aug-2021 17:18:48	080521030.d	Client	OK-3C	Soil	1	10751	Surrogates	Smp	0.1100		
26	WG27006-001	05-Aug-2021 17:29:25	080521031.d	Client	FP-16	Soil	1	10751	Surrogates	Smp	0.1100		RR-10X, all sur fail
27	WG27006-002	05-Aug-2021 17:40:02	080521032.d	Client	FP-16A	Soil	1	10751	Surrogates	Smp	0.1100		
28	ID CCV 1000_SVLC-1600	05-Aug-2021 17:50:44	080521033.d	CCV					Analytes	L-5	1.00		
29	CCB 1	05-Aug-2021 18:01:26	080521034.d	InstBlk					Surrogates	Smp	0.1100		
30	WG27006-003	05-Aug-2021 18:12:05	080521035.d	Client	FP-16C	Soil	1	10751	Surrogates	Smp	0.1100		SUR: DoA(low), insuff sample,NCM
31	WG27006-004	05-Aug-2021 18:22:48	080521036.d	Client	FP-16E	Soil	1	10751	Surrogates	Smp	0.1100		
32	WG30020-003	05-Aug-2021 18:33:22	080521037.d	Client	AFFF01-SW04-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		
33	WG30020-002	05-Aug-2021 18:43:57	080521038.d	Client	AFFF01-SW03-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		
34	WG30020-002MS	05-Aug-2021 18:54:33	080521039.d	MS		Aqueous	1	10747	Analytes	100x PDS	0.2000		
35	WG24008-001	05-Aug-2021 19:05:12	080521040.d	Client	AOPC20-SW01-EF-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		
36	WG24008-006	05-Aug-2021 19:15:51	080521041.d	Client	AOPC15-SW01-IN-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
37	WG24009-009	05-Aug-2021 19:26:28	080521042.d	Client	AOPC17,21-EXW-4-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
38	WG24009-010	05-Aug-2021 19:37:05	080521043.d	Client	AOPC18-A-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
39	WG30020-011	05-Aug-2021 19:47:44	080521044.d	Client	AFFF01-SB13-01-072921-00	Soil	5	10645	Surrogates	Smp	0.1100		
40	WG24009-007	05-Aug-2021 19:58:23	080521045.d	Client	AOPC1,6,7-14C60A-072221	Aqueous	5	10417	Surrogates	Smp	0.1100		
41	ID CCV 1000A_SVLC-1600	05-Aug-2021 20:09:03	080521046.d	CCV					Analytes	L-5	1.00		
42	CCB 2	05-Aug-2021 20:19:42	080521047.d	InstBlk					Surrogates	Smp	0.1100		
43	WG24008-002	05-Aug-2021 20:30:19	080521048.d	Client	AOPC13-SW01-IN-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		
44	WG24009-003	05-Aug-2021 20:41:01	080521049.d	Client	AOPC5-14D28A-072221	Aqueous	20	10417	Surrogates	Smp	0.1100		

Report Date: 24-Aug-2021 09:38:32 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
45	WG24009-004	05-Aug-2021 20:51:40	080521050.d	Client	AOPC5-14D36A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		
46	WG24009-006	05-Aug-2021 21:02:17	080521051.d	Client	AOPC6-14D02A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		
50	WG29024-001	05-Aug-2021 21:44:57	080521055.d	Client	PFAS in Soil	Soil	1	10561	Surrogates	Smp	0.1100		
58	ID CCV 1000B_SVLC-1600	05-Aug-2021 23:10:09	080521063.d	CCV					Analytes	L-5	1.00		
59	CCB 3	05-Aug-2021 23:20:49	080521064.d	InstBlk					Surrogates	Smp	0.1100		
60	WQ11064-001	05-Aug-2021 23:31:28	080521065.d	MBlk		Soil	1	11064	Surrogates	Smp	0.1100		
61	WQ11064-002	05-Aug-2021 23:42:07	080521066.d	LCS		Soil	1	11064	Analytes	100x PDS	0.1000		
64	WG29007-011	06-Aug-2021 00:14:04	080521069.d	Client	AFFF21-SB01-00-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		
65	WG31020-011	06-Aug-2021 00:24:41	080521070.d	Client	AFFF01-SB14-02-073021-00	Soil	1	11064	Surrogates	Smp	0.1100		
66	WG31020-012	06-Aug-2021 00:35:19	080521071.d	Client	AFFF01-SB14-07-073021-00	Soil	1	11064	Surrogates	Smp	0.1100		
67	WG31020-013	06-Aug-2021 00:45:58	080521072.d	Client	AFFF01-SB14-16-073021-00	Soil	1	11064	Surrogates	Smp	0.1100		
68	WG31020-014	06-Aug-2021 00:56:43	080521073.d	Client	AFFF01-SB24-01-073021-00	Soil	1	11064	Surrogates	Smp	0.1100		
74	ID CCV 1000_SVLC-1600	06-Aug-2021 02:00:13	080521079.d	CCV					Analytes	L-5	1.00		
75	WH03021-001	06-Aug-2021 02:10:59	080521080.d	Client	AFFF01-SB23-01-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-5X
76	WH03021-001	06-Aug-2021 02:21:39	080521081.d	Client	AFFF01-SB23-01-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
77	WH03022-017	06-Aug-2021 02:32:19	080521082.d	Client	AFFF01-SB20-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
78	WH03022-027	06-Aug-2021 02:42:59	080521083.d	Client	AFFF01-SB03-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-5X
79	WH03022-028	06-Aug-2021 02:53:39	080521084.d	Client	AFFF01-SB03-05-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
80	WH03022-029	06-Aug-2021 03:04:24	080521085.d	Client	AFFF01-SB03-11-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
81	WH03022-018	06-Aug-2021 03:15:04	080521086.d	Client	AFFF01-SB20-12-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
82	WH03022-019	06-Aug-2021 03:25:38	080521087.d	Client	AFFF01-SB20-12-080221-01	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
83	WH03022-020	06-Aug-2021 03:36:09	080521088.d	Client	AFFF01-SB20-16-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
84	WH03022-021	06-Aug-2021 03:46:48	080521089.d	Client	AFFF01-SB21-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
85	WH03022-022	06-Aug-2021 03:57:20	080521090.d	Client	AFFF01-SB21-13-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
86	WH03022-023	06-Aug-2021 04:07:53	080521091.d	Client	AFFF01-SB21-24-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
87	WH03022-024	06-Aug-2021 04:18:28	080521092.d	Client	AFFF01-SB16-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
88	WH03022-025	06-Aug-2021 04:29:10	080521093.d	Client	AFFF01-SB16-10-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
89	WH03022-026	06-Aug-2021 04:39:45	080521094.d	Client	AFFF01-SB16-15-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		

Report Date: 15-Aug-2021 10:21:17 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\081321A-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
93	ID IBLK	13-Aug-2021 16:43:26	081321A01.d	Client		Aqueous	1		Surrogates	Smp	0.1100		
94	ID CCV 100A_SVLC-1597	13-Aug-2021 16:53:59	081321A02.d	CCV					Analytes	L-2	1.00		
95	ID CCV 200A_SVLC-1598	13-Aug-2021 17:04:32	081321A03.d	CCV					Analytes	L-3	1.00		8:2(133.6%)
96	ID IBLK A	13-Aug-2021 17:21:04	081321A05.d	InstBlk					Surrogates	Smp	0.1100		
1	WH06025-007	13-Aug-2021 17:31:31	081321A06.d	Client	AFFF21-SB10-30-080421-00	Soil	1	11776	Surrogates	Smp	0.1100		
2	WH06025-005	13-Aug-2021 17:42:10	081321A07.d	Client	AFFF21-SB10-06-080421-01	Soil	1	11776	Surrogates	Smp	0.1100		
3	WH06025-004	13-Aug-2021 17:52:48	081321A08.d	Client	AFFF21-SB10-06-080421-00	Soil	1	11776	Surrogates	Smp	0.1100		
4	WH06025-006	13-Aug-2021 18:03:24	081321A09.d	Client	AFFF21-SB10-12-080421-00	Soil	1	11776	Surrogates	Smp	0.1100		
5	WH06027-001	13-Aug-2021 18:13:59	081321A10.d	Client	AFFF01-SB06-01-080421-00	Soil	1	11776	Surrogates	Smp	0.1100		
6	WH06027-002	13-Aug-2021 18:24:34	081321A11.d	Client	AFFF01-SB06-13-080421-00	Soil	1	11776	Surrogates	Smp	0.1100		
7	WH06027-003	13-Aug-2021 18:35:11	081321A12.d	Client	AFFF01-SB06-17-080421-00	Soil	1	11776	Surrogates	Smp	0.1100		
8	WH06049-003	13-Aug-2021 18:45:53	081321A13.d	Client	AFFF21-SB11-00-080521-00	Soil	1	11776	Surrogates	Smp	0.1100		RR-1X
9	WH06027-004	13-Aug-2021 18:56:31	081321A14.d	Client	AFFF01-SB06-17-080421-01	Soil	1	11776	Surrogates	Smp	0.1100		
10	WH06049-004	13-Aug-2021 19:07:10	081321A15.d	Client	AFFF21-SB11-05-080521-00	Soil	1	11776	Surrogates	Smp	0.1100		
11	ID CCV 1000_SVLC-1600	13-Aug-2021 19:17:52	081321A16.d	CCV					Analytes	L-5	1.00		
12	CCB 1	13-Aug-2021 19:28:27	081321A17.d	InstBlk					Surrogates	Smp	0.1100		
13	WH06049-006	13-Aug-2021 19:39:00	081321A18.d	Client	AFFF21-SB11-12-080521-01	Soil	1	11776	Surrogates	Smp	0.1100		
14	WH06049-007	13-Aug-2021 19:49:33	081321A19.d	Client	AFFF21-SB11-18-080521-00	Soil	1	11776	Surrogates	Smp	0.1100		
15	WH06049-008	13-Aug-2021 20:00:06	081321A20.d	Client	AFFF21-SB11-30-080521-00	Soil	1	11776	Surrogates	Smp	0.1100		
16	WH06049-013	13-Aug-2021 20:10:42	081321A21.d	Client	AFFF21-EW01-00-080521-00	Soil	1	11776	Surrogates	Smp	0.1100		RR-5X(PFOS)
17	WH06049-014	13-Aug-2021 20:21:20	081321A22.d	Client	AFFF21-EW01-06-080521-00	Soil	1	11776	Surrogates	Smp	0.1100		RR-5X(PFOS)
18	WH06049-015	13-Aug-2021 20:31:57	081321A23.d	Client	AFFF21-EW01-30-080521-00	Soil	1	11776	Surrogates	Smp	0.1100		
19	WH04042-008	13-Aug-2021 20:42:35	081321A24.d	Client	AFFF21-GW06-23-080321-00	Aqueous	5	11788	Surrogates	Smp	0.1100		RR-1X
20	WH04042-008DU	13-Aug-2021 20:53:17	081321A25.d	Client		Aqueous	5	11788	Surrogates	Smp	0.1100		RR-1X
21	WH04042-009	13-Aug-2021 21:03:57	081321A26.d	Client	AFFF21-GW06-16-080321-00	Aqueous	5	11788	Surrogates	Smp	0.1100		RR-1X
22	WH04042-009MS	13-Aug-2021 21:14:37	081321A27.d	MS		Aqueous	5	11788	Analytes	100x PDS	0.2000		
23	WH04042-010	13-Aug-2021 21:25:15	081321A28.d	Client	AFFF21-FRB-06-080321-T4	Aqueous	5	11788	Surrogates	Smp	0.1100		RR-1X
24	WH04042-011	13-Aug-2021 21:35:55	081321A29.d	Client	AFFF21-RB-05-080321-T4	Aqueous	5	11788	Surrogates	Smp	0.1100		RR-1X
25	ID CCV 1000A_SVLC-1600	13-Aug-2021 21:46:32	081321A30.d	CCV					Analytes	L-5	1.00		
26	CCB 2	13-Aug-2021 21:57:13	081321A31.d	InstBlk					Surrogates	Smp	0.1100		
27	WQ11942-001	13-Aug-2021 22:07:53	081321A32.d	MBlk		Aqueous	1	11942	Surrogates	Smp	0.1100		RR TO CONFIRM 6:2
28	WQ11942-002	13-Aug-2021 22:18:34	081321A33.d	LCS		Aqueous	1	11942	Analytes	100x PDS	0.2000		
29	WG30060-002	13-Aug-2021 22:29:12	081321A34.d	Client	ASTC-VAP-16GW-22-25)-(07	Aqueous	1	11942	Surrogates	Smp	0.1100		
30	WG30060-003	13-Aug-2021 22:39:50	081321A35.d	Client	ASTC-VAP-16GW(30-33)-(07	Aqueous	1	11942	Surrogates	Smp	0.1100		
31	WG30060-004	13-Aug-2021 22:50:31	081321A36.d	Client	ASTC-VAP-16GW(42-45)-(07	Aqueous	1	11942	Surrogates	Smp	0.1100		SUR: TeDA(low),centrifuged,NCM
32	WG30060-005	13-Aug-2021 23:01:05	081321A37.d	Client	ASTC-VAP-16GW(50-53)-(07	Aqueous	1	11942	Surrogates	Smp	0.1100		SUR: TeDA(low),centrifuged,NCM
33	WG30060-006	13-Aug-2021 23:11:41	081321A38.d	Client	ASTC-VAP-17GW(13-16)-(07	Aqueous	1	11942	Surrogates	Smp	0.1100		RR-5X (HxS)
34	WG30060-007	13-Aug-2021 23:22:16	081321A39.d	Client	ASTC-VAP-17GW(24-27)-(07	Aqueous	1	11942	Surrogates	Smp	0.1100		RR-5X
35	WG30060-009	13-Aug-2021 23:32:55	081321A40.d	Client	ASTC-EB05-(072921)	Aqueous	1	11942	Surrogates	Smp	0.1100		
36	WG30060-010	13-Aug-2021 23:43:34	081321A41.d	Client	ASTC-VAP-17GW(44-47)-(07	Aqueous	1	11942	Surrogates	Smp	0.1100		RR-20X
37	WG30060-011	13-Aug-2021 23:54:12	081321A42.d	Client	ASTC-VAP-17GW(57-60)-(07	Aqueous	1	11942	Surrogates	Smp	0.1100		sur: TeDA(low), centrifuged, NCM
38	WH06049-016	14-Aug-2021 00:04:50	081321A43.d	Client	AFFF21-FRB-09-080621-T4	Aqueous	1	11942	Surrogates	Smp	0.1100		
39	ID CCV 1000B_SVLC-1600	14-Aug-2021 00:15:27	081321A44.d	CCV					Analytes	L-5	1.00		
40	CCB 3	14-Aug-2021 00:26:14	081321A45.d	InstBlk					Surrogates	Smp	0.1100		

Report Date: 15-Aug-2021 10:21:17 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\081321A-DOD.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
41	WH06049-017	14-Aug-2021 00:36:55	081321A46.d	Client	AFFF21-RB-08-080621-T4	Aqueous	1	11942	Surrogates	Smp	0.1100		
42	WH10009-004	14-Aug-2021 00:47:34	081321A47.d	Client	AFFF21-FRB-10-081021-T3	Aqueous	1	11942	Surrogates	Smp	0.1100		
43	WH10009-007	14-Aug-2021 00:58:14	081321A48.d	Client	AFFF21-RB-08-081021-T3	Aqueous	1	11942	Surrogates	Smp	0.1100		
44	WH07017-008	14-Aug-2021 01:08:57	081321A49.d	Client	AFFF21-GW21-24-080621-00	Aqueous	20	11942	Surrogates	Smp	0.1100		RR-5X, not reported
45	WH07017-009	14-Aug-2021 01:19:34	081321A50.d	Client	AFFF21-GW21-16-080621-00	Aqueous	200	11942	Surrogates	Smp	0.1100		RR-200X, no sur added,not reported
46	WH07017-009	14-Aug-2021 01:30:17	081321A51.d	Client	AFFF21-GW21-16-080621-00	Aqueous	200	11942	Surrogates	Smp	0.1100		MS not spiked?, rr to confirm
47	WH07017-009	14-Aug-2021 01:40:57	081321A52.d	Client	AFFF21-GW21-16-080621-00	Aqueous	200	11942	Surrogates	Smp	0.1100		MD not spiked?, rr to confirm
48	ID CCV 1000C_SVLC-1600	14-Aug-2021 01:51:40	081321A53.d	CCV					Analytes	L-5	1.00		

Report Date: 15-Aug-2021 15:03:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\081421-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID IBLK SVLC-1610	14-Aug-2021 13:11:58	081421005.d	Client		Aqueous	1		Surrogates	Smp	0.1100		
96	ID CCV 100_SVLC-1597	14-Aug-2021 13:22:33	081421006.d	CCV					Analytes	L-2	1.00		
97	ID CCV 200_SVLC-1598	14-Aug-2021 13:33:10	081421007.d	CCV					Analytes	L-3	1.00		
98	ID IBLK B	14-Aug-2021 13:43:45	081421008.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ11942-001	14-Aug-2021 13:54:23	081421009.d	MBlk		Aqueous	1	11942	Surrogates	Smp	0.1100		RR confirms 6:2 detection, RX/NCM affected samples
14	WH07017-009	14-Aug-2021 16:12:31	081421022.d	Client	AFFF21-GW21-16-080621-00	Aqueous	200	11942	Surrogates	Smp	0.1100		
15	WH07017-009MS	14-Aug-2021 16:23:08	081421023.d	MS		Aqueous	200	11942	Analytes	100x PDS	0.2000		
16	WH07017-009MD	14-Aug-2021 16:33:46	081421024.d	MSD		Aqueous	200	11942	Analytes	100x PDS	0.2000		
17	ID CCV 1000_SVLC-1600	14-Aug-2021 16:44:25	081421025.d	CCV					Analytes	L-5	1.00		
18	CCB 1	14-Aug-2021 16:55:01	081421026.d	InstBlk					Surrogates	Smp	0.1100		
19	WH04042-008	14-Aug-2021 17:05:37	081421027.d	Client	AFFF21-GW06-23-080321-00	Aqueous	1	11788	Surrogates	Smp	0.1100		multiple sur failures, CENTRIFUGED, NCM
20	WH04042-008DU	14-Aug-2021 17:16:20	081421028.d	Client		Aqueous	1	11788	Surrogates	Smp	0.1100		multiple sur failures, CENTRIFUGED, NCM
21	WH04042-010	14-Aug-2021 17:27:03	081421029.d	Client	AFFF21-FRB-06-080321-T4	Aqueous	1	11788	Surrogates	Smp	0.1100		6:2 DETECTED, RX
22	WH04042-011	14-Aug-2021 17:37:41	081421030.d	Client	AFFF21-RB-05-080321-T4	Aqueous	1	11788	Surrogates	Smp	0.1100		6:2 DETECTED, RX
23	WH04042-009	14-Aug-2021 17:48:20	081421031.d	Client	AFFF21-GW06-16-080321-00	Aqueous	1	11788	Surrogates	Smp	0.1100		sur: TeDA(low), CENTRIFUGED, NCM
24	WH04042-009MS	14-Aug-2021 17:59:00	081421032.d	MS		Aqueous	1	11788	Analytes	100x PDS	0.2000		sur failures, CENTRIFUGED,NCM
25	WH06049-003	14-Aug-2021 18:09:39	081421033.d	Client	AFFF21-SB11-00-080521-00	Soil	1	11776	Surrogates	Smp	0.1100		
26	WH06049-013	14-Aug-2021 18:20:15	081421034.d	Client	AFFF21-EW01-00-080521-00	Soil	5	11776	Surrogates	Smp	0.1100		
27	WH06049-014	14-Aug-2021 18:30:55	081421035.d	Client	AFFF21-EW01-06-080521-00	Soil	5	11776	Surrogates	Smp	0.1100		
28	WG30060-007	14-Aug-2021 18:41:38	081421036.d	Client	ASTC-VAP-17GW(24-27)-(07	Aqueous	5	11942	Surrogates	Smp	0.1100		
29	WH07017-008	14-Aug-2021 18:52:16	081421037.d	Client	AFFF21-GW21-24-080621-00	Aqueous	5	11942	Surrogates	Smp	0.1100		
30	WG30060-010	14-Aug-2021 19:02:59	081421038.d	Client	ASTC-VAP-17GW(44-47)-(07	Aqueous	20	11942	Surrogates	Smp	0.1100		
31	ID CCV 1000A_SVLC-1600	14-Aug-2021 19:13:39	081421039.d	CCV					Analytes	L-5	1.00		
32	CCB 2	14-Aug-2021 19:24:14	081421040.d	InstBlk					Surrogates	Smp	0.1100		
33	WG31010-001	14-Aug-2021 19:34:50	081421041.d	Client	AOPC2,26-PFAS-C-072921	Aqueous	1	11942	Surrogates	Smp	0.1100		
34	WG31010-002	14-Aug-2021 19:45:26	081421042.d	Client	AOPC1-WU4-25-072921	Aqueous	1	11942	Surrogates	Smp	0.1100		
35	WH11048-001	14-Aug-2021 19:56:05	081421043.d	Client	AFFF21-GW27-22-081021-00	Aqueous	1	11942	Surrogates	Smp	0.1100		
36	WH11048-002	14-Aug-2021 20:06:47	081421044.d	Client	AFFF21-GW27-12-081021-00	Aqueous	1	11942	Surrogates	Smp	0.1100		RR-5X
38	WH04023-001	14-Aug-2021 20:28:06	081421046.d	Client	B-1 (0-2')	Soil	1	11767	Surrogates	Smp	0.1100		
39	WH04023-002	14-Aug-2021 20:38:45	081421047.d	Client	B-1 (2-6')	Soil	1	11767	Surrogates	Smp	0.1100		
40	WH04023-003	14-Aug-2021 20:49:26	081421048.d	Client	B-1 (6-10')	Soil	1	11767	Surrogates	Smp	0.1100		
41	WH04023-004	14-Aug-2021 21:00:08	081421049.d	Client	B-2 (0-2')	Soil	1	11767	Surrogates	Smp	0.1100		
42	WH04023-005	14-Aug-2021 21:10:46	081421050.d	Client	B-2 (2-6')	Soil	1	11767	Surrogates	Smp	0.1100		
43	ID CCV 1000B_SVLC-1600	14-Aug-2021 21:21:24	081421051.d	CCV					Analytes	L-5	1.00		
44	CCB 3	14-Aug-2021 21:32:04	081421052.d	InstBlk					Surrogates	Smp	0.1100		
45	WQ12002-001	14-Aug-2021 21:42:40	081421053.d	MBlk		Aqueous	1	12002	Surrogates	Smp	0.1100		
46	WQ12002-002	14-Aug-2021 21:53:17	081421054.d	LCS		Aqueous	1	12002	Analytes	100x PDS	0.2000		SUR: HxDA(low, non-target), NCM
47	WG30060-008	14-Aug-2021 22:03:55	081421055.d	Client	ASTC-VAP-17GW(34-37)-(07	Aqueous	1	12002	Surrogates	Smp	0.1100		RR-10X
48	WG30060-008MS	14-Aug-2021 22:14:38	081421056.d	MS		Aqueous	1	12002	Analytes	100x PDS	0.2000		
49	WG30060-008MD	14-Aug-2021 22:25:16	081421057.d	MSD		Aqueous	1	12002	Analytes	100x PDS	0.2000		
50	WG31010-003	14-Aug-2021 22:35:54	081421058.d	Client	ERB-02-072921	Aqueous	1	12002	Surrogates	Smp	0.1100		
51	WG31010-004	14-Aug-2021 22:46:35	081421059.d	Client	ERB-03-072921	Aqueous	1	12002	Surrogates	Smp	0.1100		
52	WG31010-006	14-Aug-2021 22:57:15	081421060.d	Client	AOPC2-PFAS-F-072921	Aqueous	1	12002	Surrogates	Smp	0.1100		
53	WG31010-007	14-Aug-2021 23:07:51	081421061.d	Client	AOPC2-PFAS-F-072921-FD	Aqueous	1	12002	Surrogates	Smp	0.1100		

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
54	WG31010-008	14-Aug-2021 23:18:28	081421062.d	Client	FB-16-072921	Aqueous	1	12002	Surrogates	Smp	0.1100		
55	WG31011-001	14-Aug-2021 23:29:08	081421063.d	Client	AOPC2,26-D-072721	Aqueous	1	12002	Surrogates	Smp	0.1100		
56	WG31011-002	14-Aug-2021 23:39:48	081421064.d	Client	AOPC4,11-H-072721	Aqueous	1	12002	Surrogates	Smp	0.1100		
57	WG31011-003	14-Aug-2021 23:50:28	081421065.d	Client	AOPC1,7-UST29-MW02-07272	Aqueous	1	12002	Surrogates	Smp	0.1100		RR-5X
58	WG31011-004	15-Aug-2021 00:01:08	081421066.d	Client	AOPC1,7-W20-01-072721	Aqueous	1	12002	Surrogates	Smp	0.1100		RR-20X, SUR: TeDA(LOW), MATRIX,NCM
59	ID CCV 1000C_SVLC-1600	15-Aug-2021 00:11:47	081421067.d	CCV					Analytes	L-5	1.00		

Report Date: 21-Aug-2021 12:36:25 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13	082021013.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51	082021014.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26	082021015.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05	082021016.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39	082021017.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14	082021018.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48	082021019.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29	082021020.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07	082021021.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46	082021022.d	ICal					Analytes	L-10	1.00		
11	ID IBLK	20-Aug-2021 19:36:27	082021023.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1618	20-Aug-2021 19:47:02	082021024.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK STD_SVLC-1442	20-Aug-2021 19:57:36	082021025.d	CheckStd					IsomerCheck	Smp	1.00		
14	ID IBLK A	20-Aug-2021 20:08:11	082021026.d	InstBlk					Surrogates	Smp	0.1100		
15	WQ12325-001	20-Aug-2021 20:18:47	082021027.d	MBlk		Aqueous	1	12325	Surrogates	Smp	0.1100		
16	WQ12325-002	20-Aug-2021 20:29:23	082021028.d	LCS		Aqueous	1	12325	Analytes	100x PDS	0.2000		
17	WQ12470-001	20-Aug-2021 20:40:00	082021029.d	MBlk		Aqueous	1	12470	Surrogates	Smp	0.1100		
18	WQ12470-002	20-Aug-2021 20:50:35	082021030.d	LCS		Aqueous	1	12470	Analytes	100x PDS	0.2000		
24	WH06049-011	20-Aug-2021 21:54:26	082021036.d	Client	AFFF21-FRB-06-080521-T3	Aqueous	1	12470	Surrogates	Smp	0.1100		
25	WH06049-012	20-Aug-2021 22:05:02	082021037.d	Client	AFFF21-RB-06-080521-T3	Aqueous	1	12470	Surrogates	Smp	0.1100		
26	WH06035-001	20-Aug-2021 22:15:39	082021038.d	Client	AFFF21-GAC-01-080421-T3	Aqueous	1	12325	Surrogates	Smp	0.1100		
27	WH06035-001MS	20-Aug-2021 22:26:16	082021039.d	MS		Aqueous	1	12325	Analytes	100x PDS	0.2000		
28	WH04059-005	20-Aug-2021 22:36:56	082021040.d	Client	FT006P-MW303D-00-080421	Aqueous	10	12325	Surrogates	Smp	0.1100		
29	WH04059-006	20-Aug-2021 22:47:34	082021041.d	Client	FT006P-MW303D-01-080421	Aqueous	10	12325	Surrogates	Smp	0.1100		
30	ID CCV 1000_SVLC-1619	20-Aug-2021 22:58:13	082021042.d	CCV					Analytes	L-5	1.00		
31	CCB 1	20-Aug-2021 23:08:55	082021043.d	InstBlk					Surrogates	Smp	0.1100		
32	WH06049-001	20-Aug-2021 23:19:33	082021044.d	Client	AFFF21-GW11-23-080521-00	Aqueous	1	12325	Surrogates	Smp	0.1100		sur: TeDA(low),centrifuged,NCM
33	WH06049-002	20-Aug-2021 23:30:07	082021045.d	Client	AFFF21-GW11-15-080521-00	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: TeDA(low),centrifuged,NCM
34	WH06029-001	20-Aug-2021 23:40:44	082021046.d	Client	Pool#1@LiftSta	Aqueous	1	12325	Surrogates	Smp	0.1100		MULTIPLE SUR FAILURES, CENTRIFUGED,NCM
35	WH06030-001	20-Aug-2021 23:51:22	082021047.d	Client	Pool#1@LiftSta-002	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(DETECT),TeDA(low), insuff sample,NCM
36	WH06049-009	21-Aug-2021 00:02:00	082021048.d	Client	AFFF21-FRB-08-080521-T4	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
37	WH06049-010	21-Aug-2021 00:12:37	082021049.d	Client	AFFF21-RB-07-080521-T4	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
38	WH10009-005	21-Aug-2021 00:23:13	082021050.d	Client	AFFF21-RB-09-081021-T3	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
39	WH10009-006	21-Aug-2021 00:33:50	082021051.d	Client	AFFF21-FRB-09-081021-T4	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
40	WH04047-015	21-Aug-2021 00:44:32	082021052.d	Client	AFFF01-FRB-04-080321-T2	Aqueous	1	12325	Surrogates	Smp	0.1100		
41	WH04047-016	21-Aug-2021 00:55:13	082021053.d	Client	AFFF01-FRB-04-080321-T1	Aqueous	1	12325	Surrogates	Smp	0.1100		
42	ID CCV 1000A_SVLC-1619	21-Aug-2021 01:05:54	082021054.d	CCV					Analytes	L-5	1.00		
43	CCB 2	21-Aug-2021 01:17:14	082021055.d	InstBlk					Surrogates	Smp	0.1100		
44	WQ12375-001	21-Aug-2021 01:27:56	082021056.d	MBlk		Soil	1	12375	Surrogates	Smp	0.1100		
45	WQ12375-002	21-Aug-2021 01:38:34	082021057.d	LCS		Soil	1	12375	Analytes	100x PDS	0.1000		
46	WH04040-006	21-Aug-2021 01:49:12	082021058.d	Client	AFFF21-FRB-04-080321-T3	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
47	WH04040-007	21-Aug-2021 01:59:51	082021059.d	Client	AFFF21-RB-04-080321-T3	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
48	WH06027-012	21-Aug-2021 02:10:33	082021060.d	Client	AFFF01-GW06-24-080421-00	Aqueous	5	12196	Surrogates	Smp	0.1100		
49	WH06027-014	21-Aug-2021 02:21:13	082021061.d	Client	AFFF01-GW05-26-080521-00	Aqueous	5	12196	Surrogates	Smp	0.1100		

Report Date: 21-Aug-2021 12:36:25 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
50	WH05009-005	21-Aug-2021 02:31:53	082021062.d	Client	RSA-FFS-SO-2-080321	Soil	1	12375	Surrogates	Smp	0.1100		
51	WH05009-006	21-Aug-2021 02:42:32	082021063.d	Client	RSA-FFS-2-SO-080321	Soil	1	12375	Surrogates	Smp	0.1100		
52	WH05009-008	21-Aug-2021 02:53:07	082021064.d	Client	RSA-STP4-SO-2-080321	Soil	1	12375	Surrogates	Smp	0.1100		
53	WH05009-009	21-Aug-2021 03:03:42	082021065.d	Client	RSA-FD-04-SO-080321	Soil	1	12375	Surrogates	Smp	0.1100		
54	WH05009-011	21-Aug-2021 03:14:18	082021066.d	Client	RSA-STP4-SO-1-080321	Soil	1	12375	Surrogates	Smp	0.1100		
55	WH05009-012	21-Aug-2021 03:24:57	082021067.d	Client	RSA-STP1-SO-1-080321	Soil	1	12375	Surrogates	Smp	0.1100		
56	ID CCV 1000B_SVLC-1619	21-Aug-2021 03:35:40	082021068.d	CCV					Analytes	L-5	1.00		
57	CCB 3	21-Aug-2021 03:46:20	082021069.d	InstBlk					Surrogates	Smp	0.1100		
58	WH05009-013	21-Aug-2021 03:57:01	082021070.d	Client	RSA-STP1-SO-2-080321	Soil	5	12375	Surrogates	Smp	0.1100		
59	WH05009-014	21-Aug-2021 04:07:42	082021071.d	Client	RSA-STP3-SO-2-080321	Soil	1	12375	Surrogates	Smp	0.1100		SUR: PFDA(LOW, CONFIRMED BY MS/D),NCM
60	WH05009-014MS	21-Aug-2021 04:18:23	082021072.d	MS		Soil	1	12375	Analytes	100x PDS	0.1000		
61	WH05009-014MD	21-Aug-2021 04:29:03	082021073.d	MSD		Soil	1	12375	Analytes	100x PDS	0.1000		
62	WG31010-005	21-Aug-2021 04:39:42	082021074.d	Client	AOPC2-PFAS-E-072921	Aqueous	1	12470	Surrogates	Smp	0.1100		
63	WG31010-005MS	21-Aug-2021 04:50:21	082021075.d	MS		Aqueous	1	12470	Analytes	100x PDS	0.2000		
64	WG31010-005MD	21-Aug-2021 05:01:01	082021076.d	MSD		Aqueous	1	12470	Analytes	100x PDS	0.2000		
65	WG31011-005	21-Aug-2021 05:11:39	082021077.d	Client	FB-14-072721	Aqueous	1	12470	Surrogates	Smp	0.1100		
66	WG31011-006	21-Aug-2021 05:22:20	082021078.d	Client	AOPC2-PFAS-G-072821	Aqueous	1	12470	Surrogates	Smp	0.1100		
67	WG31011-007	21-Aug-2021 05:33:02	082021079.d	Client	AOPC21-WSW-5-072821	Aqueous	1	12470	Surrogates	Smp	0.1100		SUR: 6:2(DETECT), CONFIRMS,RPT RUN 1, NCM
69	ID CCV 1000C_SVLC-1619	21-Aug-2021 05:54:26	082021081.d	CCV					Analytes	L-5	1.00		

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Mike Dahlguist

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Lot Number:**WG31010**

Date Completed:09/30/2021
Revision Date: 09/30/2021

Kathy Smith

10/01/2021 2:12 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Case Narrative
Tetra Tech
Lot Number: WG31010

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Samples WG31010-005 (parent, MS, and MSD) required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

The method blank associated with batch 11942 had 6:2 FTS detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for 6:2 FTS have been flagged with a "B".

Sample WG31010-002 had the surrogate 4:2FTS recovered above the acceptance limits. This reflects a high bias for compounds associated with this surrogate. There were no detections for these compounds in the sample; therefore, there is no impact on data quality and no corrective action is required.

Sample Summary

Tetra Tech

Lot Number: WG31010

Project Name: NASA ARC PFAS

Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC2,26-PFAS-C-072921	Aqueous	07/29/2021 1100	07/31/2021
002	AOPC1-WU4-25-072921	Aqueous	07/29/2021 1220	07/31/2021
003	ERB-02-072921	Aqueous	07/29/2021 1630	07/31/2021
004	ERB-03-072921	Aqueous	07/29/2021 1645	07/31/2021
005	AOPC2-PFAS-E-072921	Aqueous	07/29/2021 1445	07/31/2021
006	AOPC2-PFAS-F-072921	Aqueous	07/29/2021 1525	07/31/2021
007	AOPC2-PFAS-F-072921-FD	Aqueous	07/29/2021 1525	07/31/2021
008	FB-16-072921	Aqueous	07/29/2021 1700	07/31/2021

(8 samples)

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-003
Description: ERB-02-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1630
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2235	JJG	08/12/2021 1807	12002
2	SOP SPE	PFAS by ID SOP QSM B-15	1	09/23/2021 1836	JJG	08/12/2021 1807	12002
3	SOP SPE	PFAS by ID SOP QSM B-15	1	09/28/2021 0040	JJG	09/23/2021 1752	16378

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	J	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	PFAS by ID SOP	2.5	J	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	J	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	770		7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.8	J	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	8.3		7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	J	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.1	J	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	J	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.5		3.8	1.9	0.96	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	J	3.8	1.9	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	6.6		3.8	1.9	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.3	J	3.8	1.9	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	4.1		3.8	1.9	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	6.2		3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	35		3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	43		3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	4.0		3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	3.3	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	24		3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	89		3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	4.4		3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	75		3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190		3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.6	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	J	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	4.0		3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	280		3.8	1.9	0.96	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		110	50-150	H	99	50-150	H	100	50-150
13C2_6:2FTS		117	50-150	H	139	50-150	H	128	50-150
13C2_8:2FTS		108	50-150	H	95	50-150	H	92	50-150
13C2_PFDoA		91	50-150	H	80	50-150	H	79	50-150
13C2_PFTeDA		69	50-150	H	63	50-150	H	71	50-150
13C3_PFBS		95	50-150	H	94	50-150	H	88	50-150
13C3_PFHxS		104	50-150	H	80	50-150	H	83	50-150
13C3-HFPO-DA		104	50-150	H	89	50-150	H	91	50-150
13C4_PFBA		103	50-150	H	95	50-150	H	96	50-150
13C4_PFHpA		109	50-150	H	91	50-150	H	91	50-150
13C5_PFHxA		96	50-150	H	88	50-150	H	86	50-150
13C5_PFPeA		94	50-150	H	88	50-150	H	92	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-003
Description: ERB-02-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1630	Project Name: NASA ARC PFAS		
Date Received: 07/31/2021	Project Number: 103IG667601		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		94	50-150	H	87	50-150	H	84	50-150
13C7_PFUdA		89	50-150	H	87	50-150	H	86	50-150
13C8_PFOA		94	50-150	H	89	50-150	H	92	50-150
13C8_PFOS		100	50-150	H	89	50-150	H	76	50-150
13C8_PFOSA		100	50-150	H	90	50-150	H	89	50-150
13C9_PFNA		102	50-150	H	88	50-150	H	90	50-150
d5-EtFOSAA		94	50-150	H	89	50-150	H	86	50-150
d3-MeFOSAA		106	50-150	H	90	50-150	H	88	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-003
Description: ERB-02-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1630
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2235	JJG	08/12/2021 1807	12002
2	SOP SPE	PFAS by ID SOP QSM B-15	1	09/23/2021 1836	JJG	08/12/2021 1807	12002
3	SOP SPE	PFAS by ID SOP QSM B-15	1	09/28/2021 0040	JJG	09/23/2021 1752	16378

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	HJ	7.7	3.9	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	PFAS by ID SOP	2.1	HJ	7.7	3.9	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	HJ	7.7	3.9	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	720	H	7.7	3.9	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	HJ	7.7	3.9	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	7.7	H	7.7	3.9	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	HJ	7.7	3.9	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.0	HJ	7.7	3.9	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	HJ	7.7	3.9	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.2	H	3.8	1.9	0.96	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.8	HJ	3.8	1.9	0.96	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	6.3	H	3.8	1.9	0.96	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.5	HJ	3.8	1.9	0.96	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	4.8	H	3.8	1.9	0.96	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	5.4	H	3.8	1.9	0.96	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	33	H	3.8	1.9	0.96	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	40	H	3.8	1.9	0.96	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	3.7	HJ	3.8	1.9	0.96	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.8	HJ	3.8	1.9	0.96	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	23	H	3.8	1.9	0.96	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	89	H	3.8	1.9	0.96	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	4.6	H	3.8	1.9	0.96	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	69	H	3.8	1.9	0.96	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	180	H	3.8	1.9	0.96	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.4	HJ	3.8	1.9	0.96	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.3	HJ	3.8	1.9	0.96	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	3.6	HJ	3.8	1.9	0.96	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	270	H	3.8	1.9	0.96	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		110	50-150	H	99	50-150	H	100	50-150
13C2_6:2FTS		117	50-150	H	139	50-150	H	128	50-150
13C2_8:2FTS		108	50-150	H	95	50-150	H	92	50-150
13C2_PFDoA		91	50-150	H	80	50-150	H	79	50-150
13C2_PFTeDA		69	50-150	H	63	50-150	H	71	50-150
13C3_PFBS		95	50-150	H	94	50-150	H	88	50-150
13C3_PFHxS		104	50-150	H	80	50-150	H	83	50-150
13C3-HFPO-DA		104	50-150	H	89	50-150	H	91	50-150
13C4_PFBA		103	50-150	H	95	50-150	H	96	50-150
13C4_PFHpA		109	50-150	H	91	50-150	H	91	50-150
13C5_PFHxA		96	50-150	H	88	50-150	H	86	50-150
13C5_PFPeA		94	50-150	H	88	50-150	H	92	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-003
Description: ERB-02-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1630	Project Name: NASA ARC PFAS		
Date Received: 07/31/2021	Project Number: 103IG667601		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		94	50-150	H	87	50-150	H	84	50-150
13C7_PFUdA		89	50-150	H	87	50-150	H	86	50-150
13C8_PFOA		94	50-150	H	89	50-150	H	92	50-150
13C8_PFOS		100	50-150	H	89	50-150	H	76	50-150
13C8_PFOSA		100	50-150	H	90	50-150	H	89	50-150
13C9_PFNA		102	50-150	H	88	50-150	H	90	50-150
d5-EtFOSAA		94	50-150	H	89	50-150	H	86	50-150
d3-MeFOSAA		106	50-150	H	90	50-150	H	88	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31010-003
Description: ERB-02-072921
Matrix: Aqueous
Date Sampled: 07/29/2021 1630
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2235	JJG	08/12/2021 1807	12002
2	SOP SPE	PFAS by ID SOP QSM B-15	1	09/23/2021 1836	JJG	08/12/2021 1807	12002
3	SOP SPE	PFAS by ID SOP QSM B-15	1	09/28/2021 0040	JJG	09/23/2021 1752	16378

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	3
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	3
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	3
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	3
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	3
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	3
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	3
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	3
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	3
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	3

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits	Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS		110	50-150	H	99	50-150	H	100	50-150
13C2_6:2FTS		117	50-150	H	139	50-150	H	128	50-150
13C2_8:2FTS		108	50-150	H	95	50-150	H	92	50-150
13C2_PFDoA		91	50-150	H	80	50-150	H	79	50-150
13C2_PFTeDA		69	50-150	H	63	50-150	H	71	50-150
13C3_PFBS		95	50-150	H	94	50-150	H	88	50-150
13C3_PFHxS		104	50-150	H	80	50-150	H	83	50-150
13C3-HFPO-DA		104	50-150	H	89	50-150	H	91	50-150
13C4_PFBA		103	50-150	H	95	50-150	H	96	50-150
13C4_PFHpA		109	50-150	H	91	50-150	H	91	50-150
13C5_PFHxA		96	50-150	H	88	50-150	H	86	50-150
13C5_PFPeA		94	50-150	H	88	50-150	H	92	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31010-003
Description: ERB-02-072921			Matrix: Aqueous
Date Sampled: 07/29/2021 1630		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		94	50-150	H	87	50-150	H	84	50-150
13C7_PFUdA		89	50-150	H	87	50-150	H	86	50-150
13C8_PFOA		94	50-150	H	89	50-150	H	92	50-150
13C8_PFOS		100	50-150	H	89	50-150	H	76	50-150
13C8_PFOSA		100	50-150	H	90	50-150	H	89	50-150
13C9_PFNA		102	50-150	H	88	50-150	H	90	50-150
d5-EtFOSAA		94	50-150	H	89	50-150	H	86	50-150
d3-MeFOSAA		106	50-150	H	90	50-150	H	88	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

TETRA TECH

INTERNAL CORRESPONDENCE

TO: D. WILSON **DATE:** SEPTEMBER 20, 2021

FROM: GLORIA SCHIFINO **COPIES:** DV FILE

SUBJECT: **ORGANIC DATA VALIDATION – PER & POLYFLUOROALKYL SUBSTANCES (PFAS)**
NASA AMES
SAMPLE DELIVERY GROUP (SDG) WG31011

SAMPLES: 10/ Aqueous

AOPC1,7-UST29-MW02-072721	AOPC1,7-W20-01-072721
AOPC10-WGC2-11-072821	AOPC2,26-D-072721
AOPC2-PFAS-G-072821	AOPC21-WSW-5-072821
AOPC4,11-H-072721	AOPC9-W2-12-072821
FB-14-072721	FB-15-072821

Overview

The sample set for NASA Ames, SDG WG31011 consisted of ten (10) aqueous sample. All samples were analyzed for PFAS.

The samples were collected by Tetra Tech, Inc. on July 27 & 28, 2021 and analyzed by Pace Analytical. The analyses were conducted in compliance with Department of Defense (DoD)/Department of Energy (DOE) for Environmental Laboratories version 5.3 PFAS using LC/MS/MS (May 2019). The data contained in this SDG was validated via Stage 2B:

* • Data completeness
* • Hold times/Sample Preservation
* • Mass Calibration
* • LC/MS/MS System Tuning and Performance
* • Mass Spectral Acquisition Rate
* • Instrument Sensitivity Check
* • Ion Transition Check
* • Initial/Continuing Calibrations
* • Laboratory Method/Preparation and Field Blank Results
* • Field Reagent Blank Results
* • Extraction Internal Standard Recoveries
* • Injection Internal Standard Recoveries
* • Laboratory Control Sample Recoveries
* • Field Duplicate Precision
* • Compound Identification
* • Compound Quantitation
• Matrix spike/matrix spike duplicate recoveries

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, and documentation supporting these findings is presented in Appendix C.

PFAS

The recovery of the extracted internal standard 13c2 6:2 FTS in sample AOPC21-WSW-5-072821 was above the 150% control limit. The detected result for 6:2 FTS was qualified as estimated with low bias (J-). The sample was re-analyzed with similiar results. The re-analysis was selected for validation.

The matrix spike percent recoveries 6:2FTS and PFHPS was below the control limit for sample AOPC9-W2-12-072821. The detected result for 6:2 FTS was qualified as (J-). The detected result for PFHpS was estimated (J).

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

Additional Comments

The following labeled extraction internal standard recovery of 13C2 4:2 FTS was >150% quality control limit for samples AOPC10-WGC2-11-072821 and AOPC9-W2-12-072821. No validation because the sample results were nondetected.

Samples AOPC1,7-UST29-MW02-072721 and AOPC1,7-W20-01-072721 were analyzed at a dilution 5x and/or 20x dilutions for all coumpounds.

Detected results reported below the LOQ but above the Detection Limit (DL) were qualified as estimated, (J).

Non-detected results were reported to the LOD.

Executive Summary

Laboratory Performance Issues: Two extracted internal standards were outside control limits in 3 samples.

Other Factors Affecting Data Quality: Detected results below the LOQ were estimated. The matrix spike / matrix spike duplicate and relative percent differences for PFHPS and 6:2FTS were outside the quality control limits.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled “Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis be QSM Table B15” (May 2020). The text of this report has been formulated to address only those areas affecting data quality.

Gloria Schifino

Tetra Tech, Inc.
Gloria Schifino
Chemist/Data Validator

Joseph A. Samchuck

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

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

Data Qualifier Definitions

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

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

Appendix A

Qualified Analytical Results

Qualifier Codes:

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

PROJ_NO: 09033A	NSAMPLE	AOPC1,7-UST29-MW02-072721			AOPC1,7-UST29-MW02-072721-DL			AOPC1,7-W20-01-072721			AOPC1,7-W20-01-072721-DL		
SDG: WG31011	LAB_ID	WG31011-003			WG31011-003			WG31011-004			WG31011-004		
FRACTION: PFAS	SAMP_DATE	7/27/2021			7/27/2021			7/27/2021			7/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.6	U					4.1	U				
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.6	U					4.1	U				
4:2 FLUOROTELOMER SULFONATE		3.6	U					4.1	U				
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		27						160					
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		8.4						7.9	J	P			
9CL-PF3ONS		3.6	U					4.1	U				
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.6	U					4.1	U				
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.6	U					4.1	U				
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.6	U					4.1	U				
PENTADECAFLUOROOCTANOIC ACID (PFOA)		140						240					
PERFLUOROBUTANESULFONIC ACID (PFBS)		130						110					
PERFLUOROBUTANOIC ACID (PFBA)		58						200					
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U					2	U				
PERFLUORODECANOIC ACID (PFDA)		1.1	J	P				5.3					
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U					2	U				
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		27						95					
PERFLUOROHEPTANOIC ACID (PFHPA)		51						400					
PERFLUOROHEXANESULFONIC ACID (PFHXS)					1200						2200		
PERFLUOROHEXANOIC ACID (PFHXA)		150						620					
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U					3.9	J	P			
PERFLUORONONANOIC ACID (PFNA)		4.2						36					
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.9	J	P				3.5	J	P			
PERFLUOROOCTANESULFONIC ACID (PFOS)					1100						5000		
PERFLUOROPENTANESULFONIC ACID (PFPES)		130						190					

PROJ_NO: 09033A	NSAMPLE	AOPC10-WGC2-11-072821			AOPC2,26-D-072721			AOPC21-WSW-5-072821			AOPC21-WSW-5-072821-RE		
SDG: WG31011	LAB_ID	WG31011-008			WG31011-001			WG31011-007			WG31011-007		
FRACTION: PFAS	SAMP_DATE	7/28/2021			7/27/2021			7/28/2021			7/28/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.7	U		3.7	U		3.5	U				
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.7	U		3.7	U		3.5	U				
4:2 FLUOROTELOMER SULFONATE		3.7	U		3.7	U		3.5	U				
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		34	J-	D	33						30	J-	N
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.7	U		3.7	U		3.5	U				
9CL-PF3ONS		3.7	U		3.7	U		3.5	U				
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.7	U		3.7	U		3.5	U				
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.7	U		3.7	U		3.5	U				
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.7	U		3.7	U		3.5	U				
PENTADECAFLUOROOCTANOIC ACID (PFOA)		8.3			1.9	U		27					
PERFLUOROBUTANESULFONIC ACID (PFBS)		37			9.5			14					
PERFLUOROBUTANOIC ACID (PFBA)		49			13			17					
PERFLUORODECANESULFONIC ACID (PFDS)		1.9	U		1.9	U		1.8	U				
PERFLUORODECANOIC ACID (PFDA)		1.9	U		1.9	U		1.8	U				
PERFLUORODODECANOIC ACID (PFDOA)		1.9	U		1.9	U		1.8	U				
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.1	J	DP	1.9	U		1.8	U				
PERFLUOROHEPTANOIC ACID (PFHPA)		0.93	J	P	1.9	U		2.7	J	P			
PERFLUOROHEXANESULFONIC ACID (PFHXS)		120			7.7			83					
PERFLUOROHEXANOIC ACID (PFHXA)		2.1	J	P	1.9	U		2.6	J	P			
PERFLUORONONANESULFONIC ACID (PFNS)		1.9	U		1.9	U		1.8	U				
PERFLUORONONANOIC ACID (PFNA)		1.9	U		1.9	U		1.8	U				
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.9	U		1.9	U		1.2	J	P			
PERFLUOROOCTANESULFONIC ACID (PFOS)		32			3.5	J	P	99					
PERFLUOROPENTANESULFONIC ACID (PFPES)		27			1.6	J	P	7.3					

PROJ_NO: 09033A	NSAMPLE	AOPC2-PFAS-G-072821-RE			AOPC4,11-H-072721			AOPC9-W2-12-072821			FB-14-072721-RE		
SDG: WG31011	LAB_ID	WG31011-006			WG31011-002			WG31011-009			WG31011-005		
FRACTION: PFAS	SAMP_DATE	7/28/2021			7/27/2021			7/28/2021			7/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		3.6	U		3.5	U		3.6	U		3.4	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.6	U		3.5	U		3.6	U		3.4	U	
4:2 FLUOROTELOMER SULFONATE		3.6	U		3.5	U		3.6	U		3.4	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		77			5.2	J	P	9.6			3.4	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.6	U		3.5	U		3.6	U		3.4	U	
9CL-PF3ONS		3.6	U		3.5	U		3.6	U		3.4	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.6	U		3.5	U		3.6	U		3.4	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.6	U		3.5	U		3.6	U		3.4	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.6	U		3.5	U		3.6	U		3.4	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.7	J	P	16			48			1.7	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		7.7			1.2	J	P	19			1.7	U	
PERFLUOROBUTANOIC ACID (PFBA)		7.8			5.8			22			1.7	U	
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U		1.7	U		1.8	U		1.7	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U		1.7	U		1.8	U		1.7	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U		1.7	U		1.8	U		1.7	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.8	U		1.7	U		2.2	J	P	1.7	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		1.8	U		1.2	J	P	0.99	J	P	1.7	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		6.7			2.1	J	P	110			1.7	U	
PERFLUOROHEXANOIC ACID (PFHXA)		1.8	U		3.9			2.7	J	P	1.7	U	
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U		1.7	U		1.8	U		1.7	U	
PERFLUORONONANOIC ACID (PFNA)		1.8	U		1.7	U		1.8	U		1.7	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.8	U		1.7	U		1.8	U		1.7	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2	J	P	2.3	J	P	89			1.7	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		1.9	J	P	1.7	U		12			1.7	U	

PROJ_NO: 09033A	NSAMPLE	FB-15-072821		
SDG: WG31011	LAB_ID	WG31011-010		
FRACTION: PFAS	SAMP_DATE	7/28/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
11CL-PF3OUDS		3.5	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		3.5	U	
4:2 FLUOROTELOMER SULFONATE		3.5	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		3.5	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		3.5	U	
9CL-PF3ONS		3.5	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		3.5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		3.5	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		3.5	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1.8	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		1.8	U	
PERFLUOROBUTANOIC ACID (PFBA)		1.8	U	
PERFLUORODECANESULFONIC ACID (PFDS)		1.8	U	
PERFLUORODECANOIC ACID (PFDA)		1.8	U	
PERFLUORODODECANOIC ACID (PFDOA)		1.8	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		1.8	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		1.8	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		1.8	U	
PERFLUOROHEXANOIC ACID (PFHXA)		1.8	U	
PERFLUORONONANESULFONIC ACID (PFNS)		1.8	U	
PERFLUORONONANOIC ACID (PFNA)		1.8	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.8	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		1.8	U	
PERFLUOROPENTANESULFONIC ACID (PFPES)		1.8	U	

PROJ_NO: 09033A	NSAMPLE	AOPC1,7-UST29-MW02-072721			AOPC1,7-UST29-MW02-072721-DL			AOPC1,7-W20-01-072721			AOPC1,7-W20-01-072721-DL		
SDG: WG31011	LAB_ID	WG31011-003			WG31011-003			WG31011-004			WG31011-004		
FRACTION: PFAS	SAMP_DATE	7/27/2021			7/27/2021			7/27/2021			7/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		110									1400		
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U					2	UJ	N			
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U					2	U				
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U					1.2	J	P			

PROJ_NO: 09033A	NSAMPLE	AOPC10-WGC2-11-072821			AOPC2,26-D-072721			AOPC21-WSW-5-072821			AOPC21-WSW-5-072821-RE		
SDG: WG31011	LAB_ID	WG31011-008			WG31011-001			WG31011-007			WG31011-007		
FRACTION: PFAS	SAMP_DATE	7/28/2021			7/27/2021			7/28/2021			7/28/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		2.3	J	P	1.9	U		1.7	J	P			
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.9	U		1.9	U		1.8	U				
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.9	U		1.9	U		1.8	U				
PERFLUOROUNDECANOIC ACID (PFUNA)		1.9	U		1.9	U		1.8	U				

PROJ_NO: 09033A	NSAMPLE	AOPC2-PFAS-G-072821-RE			AOPC4,11-H-072721			AOPC9-W2-12-072821			FB-14-072721-RE		
SDG: WG31011	LAB_ID	WG31011-006			WG31011-002			WG31011-009			WG31011-005		
FRACTION: PFAS	SAMP_DATE	7/28/2021			7/27/2021			7/28/2021			7/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.8	U		3.9			1.5	J	P	1.7	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U		1.7	U		1.8	U		1.7	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U		1.7	U		1.8	U		1.7	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U		1.7	U		1.8	U		1.7	U	

PROJ_NO: 09033A	NSAMPLE	FB-15-072821		
SDG: WG31011	LAB_ID	WG31011-010		
FRACTION: PFAS	SAMP_DATE	7/28/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		1.8	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		1.8	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		1.8	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.8	U	

Appendix B

Results as Reported by the Laboratory

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-001
Description: AOPC2,26-D-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1135
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2329	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	33		7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.5		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.6	J	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	7.7		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	13		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.5	J	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		98	50-150
13C2_6:2FTS		103	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		66	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		80	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		86	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31011-001
Description: AOPC2,26-D-072721			Matrix: Aqueous
Date Sampled: 07/27/2021 1135		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	50-150
13C8_PFOS		77	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		86	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-002
Description: AOPC4,11-H-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1337
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2339	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.2	J	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.2	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	5.8		3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.2	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.9		3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	16		3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	3.9		3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.3	J	3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		134	50-150
13C2_6:2FTS		115	50-150
13C2_8:2FTS		118	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		99	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		110	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		105	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		101	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31011-002
Description: AOPC4,11-H-072721			Matrix: Aqueous
Date Sampled: 07/27/2021 1337		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		104	50-150
13C8_PFOS		99	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-003
Description: AOPC1,7-UST29-MW02-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/14/2021 2350	JJG	08/12/2021 1807	12002
2	SOP SPE	PFAS by ID SOP QSM B-15	5	08/16/2021 1408	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	8.4		7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	27		7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	130		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	27		3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	J	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	130		3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1200		18	9.0	4.4	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	58		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.1	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	51		3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	150		3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	4.2		3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	140		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	110		3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1100		18	9.0	4.4	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		120	50-150		112	50-150
13C2_6:2FTS		118	50-150		128	50-150
13C2_8:2FTS		106	50-150		98	50-150
13C2_PFDoA		94	50-150		100	50-150
13C2_PFTeDA		88	50-150		107	50-150
13C3_PFBS		97	50-150		106	50-150
13C3_PFHxS		91	50-150		106	50-150
13C3-HFPO-DA		110	50-150		104	50-150
13C4_PFBA		101	50-150		103	50-150
13C4_PFHpA		101	50-150		112	50-150
13C5_PFHxA		100	50-150		105	50-150
13C5_PFPeA		103	50-150		99	50-150
13C6_PFDA		92	50-150		104	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-003
Description: AOPC1,7-UST29-MW02-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1620
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		102	50-150		105	50-150
13C8_PFOA		103	50-150		99	50-150
13C8_PFOS		92	50-150		104	50-150
13C8_PFOSA		91	50-150		110	50-150
13C9_PFNA		91	50-150		99	50-150
d5-EtFOSAA		94	50-150		102	50-150
d3-MeFOSAA		104	50-150		111	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-004
Description: AOPC1,7-W20-01-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1820
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/15/2021 0001	JJG	08/12/2021 1807	12002
2	SOP SPE	PFAS by ID SOP QSM B-15	20	08/16/2021 1511	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	7.9	J	8.1	4.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	160		8.1	4.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	110		4.0	2.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	95		4.0	2.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	3.9	J	4.0	2.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	3.5	J	4.0	2.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	190		4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2400	E	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	200		4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	5.3		4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	400		4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	620		4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	36		4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	240		4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1400	E	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	UQ	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.2	J	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5700	E	4.0	2.0	1.0	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		113	50-150		110	50-150
13C2_6:2FTS		93	50-150		95	50-150
13C2_8:2FTS		94	50-150		102	50-150
13C2_PFDoA		59	50-150		93	50-150
13C2_PFTeDA	N	33	50-150		95	50-150
13C3_PFBS		80	50-150		97	50-150
13C3_PFHxS		77	50-150		103	50-150
13C3-HFPO-DA		87	50-150		98	50-150
13C4_PFBA		73	50-150		97	50-150
13C4_PFHpA		83	50-150		95	50-150
13C5_PFHxA		79	50-150		100	50-150
13C5_PFPeA		78	50-150		94	50-150
13C6_PFDA		75	50-150		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-004
Description: AOPC1,7-W20-01-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1820
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		67	50-150		98	50-150
13C8_PFOA		75	50-150		89	50-150
13C8_PFOS		69	50-150		96	50-150
13C8_PFOSA		72	50-150		98	50-150
13C9_PFNA		66	50-150		97	50-150
d5-EtFOSAA		70	50-150		95	50-150
d3-MeFOSAA		74	50-150		107	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-004
Description: AOPC1,7-W20-01-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1820
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/15/2021 0001	JJG	08/12/2021 1807	12002
2	SOP SPE	PFAS by ID SOP QSM B-15	20	08/16/2021 1511	JJG	08/12/2021 1807	12002

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	80	U	160	80	40	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	80	U	160	80	40	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	80	U	160	80	40	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	180		160	80	40	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	80	U	160	80	40	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	80	U	160	80	40	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	80	U	160	80	40	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	80	U	160	80	40	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	80	U	160	80	40	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	110		81	41	20	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	76	J	81	41	20	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	200		81	41	20	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2200		81	41	20	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	180		81	41	20	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	400		81	41	20	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	570		81	41	20	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	33	J	81	41	20	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	210		81	41	20	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1400		81	41	20	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	41	U	81	41	20	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5000		81	41	20	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		113	50-150		110	50-150
13C2_6:2FTS		93	50-150		95	50-150
13C2_8:2FTS		94	50-150		102	50-150
13C2_PFDoA		59	50-150		93	50-150
13C2_PFTeDA	N	33	50-150		95	50-150
13C3_PFBS		80	50-150		97	50-150
13C3_PFHxS		77	50-150		103	50-150
13C3-HFPO-DA		87	50-150		98	50-150
13C4_PFBA		73	50-150		97	50-150
13C4_PFHpA		83	50-150		95	50-150
13C5_PFHxA		79	50-150		100	50-150
13C5_PFPeA		78	50-150		94	50-150
13C6_PFDA		75	50-150		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-004
Description: AOPC1,7-W20-01-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1820
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		67	50-150		98	50-150
13C8_PFOA		75	50-150		89	50-150
13C8_PFOS		69	50-150		96	50-150
13C8_PFOSA		72	50-150		98	50-150
13C9_PFNA		66	50-150		97	50-150
d5-EtFOSAA		70	50-150		95	50-150
d3-MeFOSAA		74	50-150		107	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-005
Description: FB-14-072721
Matrix: Aqueous
Date Sampled: 07/27/2021 1830
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/21/2021 0511	JJG	08/18/2021 1159	12470

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		91	50-150
13C2_6:2FTS		132	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		73	50-150
13C2_PFTeDA		59	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		92	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		84	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		75	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31011-005
Description: FB-14-072721			Matrix: Aqueous
Date Sampled: 07/27/2021 1830		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		96	50-150
13C8_PFOS		74	50-150
13C8_PFOSA		79	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-006
Description: AOPC2-PFAS-G-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1025
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/21/2021 0522	JJG	08/18/2021 1159	12470

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	77		7.2	3.6	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.7		3.6	1.8	0.91	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.9	J	3.6	1.8	0.91	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	6.7		3.6	1.8	0.91	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	7.8		3.6	1.8	0.91	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	J	3.6	1.8	0.91	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	J	3.6	1.8	0.91	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		129	50-150
13C2_6:2FTS		109	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		74	50-150
13C2_PFTeDA		62	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		85	50-150
13C3-HFPO-DA		106	50-150
13C4_PFBA		109	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		87	50-150
13C7_PFUdA		78	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31011-006
Description: AOPC2-PFAS-G-072821			Matrix: Aqueous
Date Sampled: 07/28/2021 1025		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		107	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		99	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-007
Description: AOPC21-WSW-5-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/16/2021 1948	JJG	08/13/2021 1203	12076
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/21/2021 0533	JJG	08/18/2021 1159	12470

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	25	BQ	7.0	3.5	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	14		3.5	1.8	0.88	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	7.3		3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	83		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	17		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.7	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.6	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	27		3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	99		3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		134	50-150		132	50-150
13C2_6:2FTS	N	226	50-150	N	196	50-150
13C2_8:2FTS		115	50-150		127	50-150
13C2_PFDoA		105	50-150		98	50-150
13C2_PFTeDA		104	50-150		82	50-150
13C3_PFBS		115	50-150		99	50-150
13C3_PFHxS		104	50-150		95	50-150
13C3-HFPO-DA		106	50-150		109	50-150
13C4_PFBA		108	50-150		109	50-150
13C4_PFHpA		113	50-150		97	50-150
13C5_PFHxA		109	50-150		102	50-150
13C5_PFPeA		103	50-150		102	50-150
13C6_PFDA		102	50-150		95	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-007
Description: AOPC21-WSW-5-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		116	50-150		103	50-150
13C8_PFOA		102	50-150		117	50-150
13C8_PFOS		102	50-150		93	50-150
13C8_PFOSA		106	50-150		93	50-150
13C9_PFNA		105	50-150		105	50-150
d5-EtFOSAA		121	50-150		135	50-150
d3-MeFOSAA		113	50-150		135	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-007
Description: AOPC21-WSW-5-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/16/2021 1948	JJG	08/13/2021 1203	12076
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/21/2021 0533	JJG	08/18/2021 1159	12470

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	30	Q	7.6	3.8	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	15		3.8	1.9	0.95	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.3	J	3.8	1.9	0.95	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.5	J	3.8	1.9	0.95	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	7.8		3.8	1.9	0.95	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	91		3.8	1.9	0.95	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	18		3.8	1.9	0.95	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.8	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.7	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	29		3.8	1.9	0.95	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	J	3.8	1.9	0.95	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	95		3.8	1.9	0.95	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		134	50-150		132	50-150
13C2_6:2FTS	N	226	50-150	N	196	50-150
13C2_8:2FTS		115	50-150		127	50-150
13C2_PFDoA		105	50-150		98	50-150
13C2_PFTeDA		104	50-150		82	50-150
13C3_PFBS		115	50-150		99	50-150
13C3_PFHxS		104	50-150		95	50-150
13C3-HFPO-DA		106	50-150		109	50-150
13C4_PFBA		108	50-150		109	50-150
13C4_PFHpA		113	50-150		97	50-150
13C5_PFHxA		109	50-150		102	50-150
13C5_PFPeA		103	50-150		102	50-150
13C6_PFDA		102	50-150		95	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-007
Description: AOPC21-WSW-5-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1210
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		116	50-150		103	50-150
13C8_PFOA		102	50-150		117	50-150
13C8_PFOS		102	50-150		93	50-150
13C8_PFOSA		106	50-150		93	50-150
13C9_PFNA		105	50-150		105	50-150
d5-EtFOSAA		121	50-150		135	50-150
d3-MeFOSAA		113	50-150		135	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-008
Description: AOPC10-WGC2-11-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1300
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/15/2021 2133	MMM	08/13/2021 1902	12136

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	34	S	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	37		3.7	1.9	0.92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.1	J	3.7	1.9	0.92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	27		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	120	S	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	49		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.93	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.1	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	8.3		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.3	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	32		3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	155	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		111	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		110	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-008
Description: AOPC10-WGC2-11-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1300
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	50-150
13C8_PFOS		77	50-150
13C8_PFOSA		107	50-150
13C9_PFNA		91	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-009
Description: AOPC9-W2-12-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/15/2021 2154	MMM	08/13/2021 1902	12136

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	9.6		7.1	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	UQ	7.1	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	19		3.5	1.8	0.89	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.2	J	3.5	1.8	0.89	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	12		3.5	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	110		3.5	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	22		3.5	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.99	J	3.5	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.7	J	3.5	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	48		3.5	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.5	J	3.5	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	89		3.5	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	172	50-150
13C2_6:2FTS		129	50-150
13C2_8:2FTS		107	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		98	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		107	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		97	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-009
Description: AOPC9-W2-12-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1430
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		102	50-150
13C8_PFOS		90	50-150
13C8_PFOSA		98	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		106	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WG31011-010
Description: FB-15-072821
Matrix: Aqueous
Date Sampled: 07/28/2021 1450
Project Name: NASA ARC PFAS
Date Received: 07/31/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/15/2021 2215	MMM	08/13/2021 1902	12136

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		116	50-150
13C2_6:2FTS		148	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		72	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		101	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		98	50-150
13C6_PFDA		84	50-150
13C7_PFUdA		103	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: WG31011-010
Description: FB-15-072821			Matrix: Aqueous
Date Sampled: 07/28/2021 1450		Project Name: NASA ARC PFAS	
Date Received: 07/31/2021		Project Number: 103IG667601	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	50-150
13C8_PFOS		78	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Appendix C

Support Documentation

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122461

Client: Tetra Tech
Address: 1999 Harrison St
City: Oakland | State: CA | Zip Code: 94612
Project Name: NASA ARC PFAS
Project No.: 103IG667601 | P.O. No.:

Report to Contact: Mike Dahlquist
Sampler's Signature: X [signature]
Printed Name: Ryan Melendez, Anya Mikheucheva

Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com
Quote No.:
Analysis (Attach list if more space is needed)
Page 1 of 2
Lot # Bar Code: WG31011
KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	HNO3	HCl	NaOH	5035 Kit	Other Filtered	PFAS (QSMB-15)	Remarks / Cooler I.D.
AOPC2,26-D-072721	7/27/21	1135	G	X			2						X	
AOPC4,11-H-072721	7/27/21	1337	G	X			2						X	
AOPC1,7-UST29-MW02-072721	7/27/21	1620	G	X			2						X	
AOPC1,7-W20-01-072721	07/27/21	1820	G	X			2						X	
FB-14-072721	07/27/21	1830	G	X			2						X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)
Sample Disposal ☐ Return to Client ☐ Disposal by Lab
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt Gm Mus	7/30/21	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/31/21	0905	4. Laboratory received by: [signature]	7/31/21	0905

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) (Yes) No Ice Pack
Receipt Temp. 4.2 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 122462

Client: Tetra Tech
Address: 1999 Harrison St
City: Oakland | State: CA | Zip Code: 94612
Project Name: NASA ARC PFAS
Project No.: 103IG667601 | P.O. No.:

Report to Contact: Mike Dahlquist
Sampler's Signature: x [signature]
Printed Name: Callie Neaves, Ryan Melendez

Telephone No. / E-mail: (510) 302-6310 / Mike.Dahlquist@tetratech.com
Quote No.:
Analysis (Attach list if more space is needed):
Page 2 of 2

WG31011
KES3

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Cut-Off Date/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Liquid	H2SO4	HNO3	HCl	NaOH	5035 w/	Field Filtered	PFAS (QSMB-15)	Remarks / Cooler I.D.
AOPC2-PFAS-G-072821	7/28/21	1025	G	X			2							X	
AOPC21-WSW-5-072821	7/28/21	1210	G	X			2							X	
AOPC10-WGC2-11-072821	7/28/21	1300	G	X			2							X	
AOPC9-W2-12-072821	7/28/21	1430	G	X			2							X	
FB-15-072821	7/28/21	1450	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)
Sample Disposal ☐ Return to Client ☐ Disposal by Lab
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Callie Neaves Tt [signature]	7/30/21	1500	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	7/31/21	0905	4. Laboratory received by: [signature]	7/31/21	0905

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack
Receipt Temp. 4.2 °C
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Case Narrative
Tetra Tech
Lot Number: WG31011

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Samples WG31011-001, WG31011-006 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet.

For sample WG31011-004, sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Surrogate recovery may be adversely affected.

Sample WG31011-004 had the surrogate PFTeDA recovered outside of the acceptance limits due to matrix interference. The sample was reanalyzed at a dilution and both sets of data have been reported.

Surrogate recovery for the following samples was outside the upper control limit: WG31011-008, WG31011-009. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: WG31011-007. Re-extraction and/or re-analysis was performed with concurring results. Both sets of data have been reported.

The method blank associated with batch 12076 had 6:2 FTS detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for 6:2 FTS have been flagged with a "B".

The MS/MSD associated with sample WG31011-008 had multiple analytes recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample Summary
Tetra Tech
Lot Number: WG31011
Project Name: NASA ARC PFAS
Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC2,26-D-072721	Aqueous	07/27/2021 1135	07/31/2021
002	AOPC4,11-H-072721	Aqueous	07/27/2021 1337	07/31/2021
003	AOPC1,7-UST29-MW02-072721	Aqueous	07/27/2021 1620	07/31/2021
004	AOPC1,7-W20-01-072721	Aqueous	07/27/2021 1820	07/31/2021
005	FB-14-072721	Aqueous	07/27/2021 1830	07/31/2021
006	AOPC2-PFAS-G-072821	Aqueous	07/28/2021 1025	07/31/2021
007	AOPC21-WSW-5-072821	Aqueous	07/28/2021 1210	07/31/2021
008	AOPC10-WGC2-11-072821	Aqueous	07/28/2021 1300	07/31/2021
009	AOPC9-W2-12-072821	Aqueous	07/28/2021 1430	07/31/2021
010	FB-15-072821	Aqueous	07/28/2021 1450	07/31/2021

(10 samples)

PFAS by LC/MS/MS - MB

Sample ID: WQ12002-001
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/14/2021 2142
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/14/2021 2142

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12002-001
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		96	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12002-002
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	100	70-150	08/14/2021 2153
11Cl-PF3OUdS	15	13		1	88	70-150	08/14/2021 2153
8:2 FTS	15	16		1	107	67-138	08/14/2021 2153
6:2 FTS	15	17		1	114	64-140	08/14/2021 2153
4:2 FTS	15	17		1	117	63-143	08/14/2021 2153
GenX	32	33		1	104	70-150	08/14/2021 2153
ADONA	15	17		1	112	70-150	08/14/2021 2153
EtFOSAA	16	15		1	97	61-135	08/14/2021 2153
MeFOSAA	16	18		1	114	65-136	08/14/2021 2153
PFBS	14	15		1	105	72-130	08/14/2021 2153
PFDS	15	12		1	75	53-142	08/14/2021 2153
PFHpS	15	17		1	110	69-134	08/14/2021 2153
PFNS	15	16		1	102	69-127	08/14/2021 2153
PFOSA	16	16		1	102	67-137	08/14/2021 2153
PFPeS	15	15		1	100	71-127	08/14/2021 2153
PFHxS	15	15		1	100	68-131	08/14/2021 2153
PFBA	16	17		1	109	73-129	08/14/2021 2153
PFDA	16	17		1	104	71-129	08/14/2021 2153
PFDoA	16	19		1	118	72-134	08/14/2021 2153
PFHpA	16	17		1	106	72-130	08/14/2021 2153
PFHxA	16	16		1	103	72-129	08/14/2021 2153
PFNA	16	17		1	104	69-130	08/14/2021 2153
PFOA	16	17		1	108	71-133	08/14/2021 2153
PFPeA	16	17		1	105	72-129	08/14/2021 2153
PFTeDA	16	18		1	112	71-132	08/14/2021 2153
PFTrDA	16	17		1	108	65-144	08/14/2021 2153
PFUdA	16	19		1	119	69-133	08/14/2021 2153
PFOS	15	15		1	99	65-140	08/14/2021 2153

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		58	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12002-002
Batch: 12002
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/12/2021 1807

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		90	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		82	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12076-001
Batch: 12076
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1203

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
6:2 FTS	9.0		1	8.0	4.0	2.0	ng/L	08/16/2021 1751
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/16/2021 1751
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/16/2021 1751

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	50-150
13C2_6:2FTS		108	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		100	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		105	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		97	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12076-001
Batch: 12076
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1203

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		88	50-150
13C8_PFOS		83	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12076-002
Batch: 12076
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1203

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	105	70-150	08/16/2021 1801
11Cl-PF3OUdS	15	15		1	96	70-150	08/16/2021 1801
8:2 FTS	15	15		1	95	67-138	08/16/2021 1801
6:2 FTS	15	20		1	134	64-140	08/16/2021 1801
4:2 FTS	15	16		1	105	63-143	08/16/2021 1801
GenX	32	32		1	99	70-150	08/16/2021 1801
ADONA	15	17		1	115	70-150	08/16/2021 1801
EtFOSAA	16	17		1	108	61-135	08/16/2021 1801
MeFOSAA	16	17		1	103	65-136	08/16/2021 1801
PFBS	14	17		1	117	72-130	08/16/2021 1801
PFDS	15	15		1	97	53-142	08/16/2021 1801
PFHpS	15	17		1	110	69-134	08/16/2021 1801
PFNS	15	15		1	99	69-127	08/16/2021 1801
PFOSA	16	16		1	97	67-137	08/16/2021 1801
PFPeS	15	16		1	106	71-127	08/16/2021 1801
PFHxS	15	17		1	120	68-131	08/16/2021 1801
PFBA	16	18		1	111	73-129	08/16/2021 1801
PFDA	16	17		1	108	71-129	08/16/2021 1801
PFDoA	16	17		1	109	72-134	08/16/2021 1801
PFHpA	16	16		1	102	72-130	08/16/2021 1801
PFHxA	16	17		1	106	72-129	08/16/2021 1801
PFNA	16	16		1	102	69-130	08/16/2021 1801
PFOA	16	18		1	115	71-133	08/16/2021 1801
PFPeA	16	18		1	115	72-129	08/16/2021 1801
PFTeDA	16	18		1	113	71-132	08/16/2021 1801
PFTrDA	16	17		1	106	65-144	08/16/2021 1801
PFUdA	16	16		1	102	69-133	08/16/2021 1801
PFOS	15	18		1	119	65-140	08/16/2021 1801

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		118	50-150
13C2_6:2FTS		103	50-150
13C2_8:2FTS		105	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		109	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		108	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12076-002
Batch: 12076
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1203

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	50-150
13C7_PFUdA		101	50-150
13C8_PFOA		90	50-150
13C8_PFOS		99	50-150
13C8_PFOSA		110	50-150
13C9_PFNA		102	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12136-001
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/15/2021 2112
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/15/2021 2112

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		116	50-150
13C2_6:2FTS		129	50-150
13C2_8:2FTS		101	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12136-001
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		90	50-150
13C7_PFUdA		98	50-150
13C8_PFOA		93	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12136-002
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	104	70-150	08/15/2021 2123
11Cl-PF3OUdS	15	16		1	106	70-150	08/15/2021 2123
8:2 FTS	15	14		1	91	67-138	08/15/2021 2123
6:2 FTS	15	16		1	103	64-140	08/15/2021 2123
4:2 FTS	15	13		1	86	63-143	08/15/2021 2123
GenX	32	30		1	93	70-150	08/15/2021 2123
ADONA	15	16		1	107	70-150	08/15/2021 2123
EtFOSAA	16	17		1	103	61-135	08/15/2021 2123
MeFOSAA	16	17		1	105	65-136	08/15/2021 2123
PFBS	14	15		1	109	72-130	08/15/2021 2123
PFDS	15	18		1	117	53-142	08/15/2021 2123
PFHpS	15	17		1	110	69-134	08/15/2021 2123
PFNS	15	17		1	110	69-127	08/15/2021 2123
PFOSA	16	15		1	95	67-137	08/15/2021 2123
PFPeS	15	17		1	114	71-127	08/15/2021 2123
PFHxS	15	14		1	95	68-131	08/15/2021 2123
PFBA	16	18		1	111	73-129	08/15/2021 2123
PFDA	16	18		1	113	71-129	08/15/2021 2123
PFDoA	16	17		1	108	72-134	08/15/2021 2123
PFHpA	16	18		1	114	72-130	08/15/2021 2123
PFHxA	16	18		1	111	72-129	08/15/2021 2123
PFNA	16	18		1	115	69-130	08/15/2021 2123
PFOA	16	16		1	99	71-133	08/15/2021 2123
PFPeA	16	16		1	100	72-129	08/15/2021 2123
PFTeDA	16	19		1	120	71-132	08/15/2021 2123
PFTrDA	16	18		1	114	65-144	08/15/2021 2123
PFUdA	16	19		1	120	69-133	08/15/2021 2123
PFOS	15	16		1	108	65-140	08/15/2021 2123

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		127	50-150
13C2_6:2FTS		113	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12136-002
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		81	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		98	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		98	50-150
13C9_PFNA		91	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG31011-008MS
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	15	19		1	124	70-150	08/15/2021 2144
11Cl-PF3OUdS	ND	15	16		1	107	70-150	08/15/2021 2144
8:2 FTS	ND	15	16		1	102	67-138	08/15/2021 2144
6:2 FTS	34	15	37	N	1	21	64-140	08/15/2021 2144
4:2 FTS	ND	15	18		1	121	63-143	08/15/2021 2144
GenX	ND	32	32		1	100	70-150	08/15/2021 2144
ADONA	ND	15	16		1	104	70-150	08/15/2021 2144
EtFOSAA	ND	16	15		1	95	61-135	08/15/2021 2144
MeFOSAA	ND	16	18		1	112	65-136	08/15/2021 2144
PFBS	37	14	55		1	126	72-130	08/15/2021 2144
PFDS	ND	16	18		1	113	53-142	08/15/2021 2144
PFHpS	1.1	15	19		1	114	69-134	08/15/2021 2144
PFNS	ND	15	17		1	112	69-127	08/15/2021 2144
PFOSA	ND	16	16		1	100	67-137	08/15/2021 2144
PFPeS	27	15	39		1	78	71-127	08/15/2021 2144
PFHxS	120	15	130	N	1	38	68-131	08/15/2021 2144
PFBA	49	16	65		1	98	73-129	08/15/2021 2144
PFDA	ND	16	19		1	118	71-129	08/15/2021 2144
PFDoA	ND	16	17		1	106	72-134	08/15/2021 2144
PFHpA	0.93	16	19		1	117	72-130	08/15/2021 2144
PFHxA	2.1	16	19		1	102	72-129	08/15/2021 2144
PFNA	ND	16	16		1	102	69-130	08/15/2021 2144
PFOA	8.3	16	25		1	101	71-133	08/15/2021 2144
PFPeA	2.3	16	18		1	96	72-129	08/15/2021 2144
PFTeDA	ND	16	18		1	111	71-132	08/15/2021 2144
PFTrDA	ND	16	17		1	108	65-144	08/15/2021 2144
PFUdA	ND	16	19		1	118	69-133	08/15/2021 2144
PFOS	32	15	49		1	117	65-140	08/15/2021 2144

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		145	50-150
13C2_6:2FTS		117	50-150
13C2_8:2FTS		92	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		110	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WG31011-008MS
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		99	50-150
13C8_PFOS		76	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG31011-009DU
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	08/15/2021 2205
11Cl-PF3OUdS	ND	ND		1	0.00	20	08/15/2021 2205
8:2 FTS	ND	ND		1	0.00	20	08/15/2021 2205
6:2 FTS	9.6	11		1	13	20	08/15/2021 2205
4:2 FTS	ND	ND		1	0.00	20	08/15/2021 2205
GenX	ND	ND		1	0.00	20	08/15/2021 2205
ADONA	ND	ND		1	0.00	20	08/15/2021 2205
EtFOSAA	ND	ND		1	0.00	20	08/15/2021 2205
MeFOSAA	ND	ND		1	0.00	20	08/15/2021 2205
PFBS	19	19		1	0.35	20	08/15/2021 2205
PFDS	ND	ND		1	0.00	20	08/15/2021 2205
PFHpS	2.2	2.8	+	1	24	20	08/15/2021 2205
PFNS	ND	ND		1	0.00	20	08/15/2021 2205
PFOSA	ND	ND		1	0.00	20	08/15/2021 2205
PFPeS	12	12		1	5.4	20	08/15/2021 2205
PFHxS	110	130		1	9.5	20	08/15/2021 2205
PFBA	22	21		1	4.8	20	08/15/2021 2205
PFDA	ND	ND		1	0.00	20	08/15/2021 2205
PFDoA	ND	ND		1	0.00	20	08/15/2021 2205
PFHpA	0.99	1.3	+	1	28	20	08/15/2021 2205
PFHxA	2.7	2.8	J	1	2.7	20	08/15/2021 2205
PFNA	ND	ND		1	0.00	20	08/15/2021 2205
PFOA	48	48		1	0.41	20	08/15/2021 2205
PFPeA	1.5	1.6	J	1	9.9	20	08/15/2021 2205
PFTeDA	ND	ND		1	0.00	20	08/15/2021 2205
PFTrDA	ND	ND		1	0.00	20	08/15/2021 2205
PFUdA	ND	ND		1	0.00	20	08/15/2021 2205
PFOS	89	89		1	0.47	20	08/15/2021 2205

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	161	50-150
13C2_6:2FTS	N	171	50-150
13C2_8:2FTS		105	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		96	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		109	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WG31011-009DU
Batch: 12136
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/13/2021 1902

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		105	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		89	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		110	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12470-001
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/20/2021 2040
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/20/2021 2040

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		94	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		86	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ12470-001
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		86	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12470-002
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	104	70-150	08/20/2021 2050
11Cl-PF3OUdS	15	14		1	91	70-150	08/20/2021 2050
8:2 FTS	15	17		1	110	67-138	08/20/2021 2050
6:2 FTS	15	15		1	97	64-140	08/20/2021 2050
4:2 FTS	15	13		1	89	63-143	08/20/2021 2050
GenX	32	30		1	94	70-150	08/20/2021 2050
ADONA	15	18		1	117	70-150	08/20/2021 2050
EtFOSAA	16	14		1	90	61-135	08/20/2021 2050
MeFOSAA	16	15		1	92	65-136	08/20/2021 2050
PFBS	14	14		1	97	72-130	08/20/2021 2050
PFDS	15	16		1	104	53-142	08/20/2021 2050
PFHpS	15	16		1	103	69-134	08/20/2021 2050
PFNS	15	16		1	104	69-127	08/20/2021 2050
PFOSA	16	17		1	107	67-137	08/20/2021 2050
PFPeS	15	15		1	103	71-127	08/20/2021 2050
PFHxS	15	15		1	101	68-131	08/20/2021 2050
PFBA	16	16		1	99	73-129	08/20/2021 2050
PFDA	16	18		1	110	71-129	08/20/2021 2050
PFDoA	16	18		1	111	72-134	08/20/2021 2050
PFHpA	16	17		1	108	72-130	08/20/2021 2050
PFHxA	16	17		1	105	72-129	08/20/2021 2050
PFNA	16	17		1	105	69-130	08/20/2021 2050
PFOA	16	17		1	105	71-133	08/20/2021 2050
PFPeA	16	16		1	102	72-129	08/20/2021 2050
PFTeDA	16	16		1	102	71-132	08/20/2021 2050
PFTrDA	16	16		1	99	65-144	08/20/2021 2050
PFUdA	16	17		1	109	69-133	08/20/2021 2050
PFOS	15	15		1	102	65-140	08/20/2021 2050

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	50-150
13C2_6:2FTS		92	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		82	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ12470-002
Batch: 12470
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/18/2021 1159

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		92	50-150
13C8_PFOS		79	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31011

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC2,26-D-072721	98	103	89	81	66	76	80	93	86
AOPC4,11-H-072721	134	115	118	85	76	99	104	110	87
AOPC1,7-UST29-MW02-072721	120	118	106	94	88	97	91	110	101
AOPC1,7-UST29-MW02-072721	112	128	98	100	107	106	106	104	103
AOPC1,7-W20-01-072721	113	93	94	59	33 *	80	77	87	73
AOPC1,7-W20-01-072721	110	95	102	93	95	97	103	98	97
FB-14-072721	91	132	89	73	59	86	82	92	87
AOPC2-PFAS-G-072821	129	109	92	74	62	102	85	106	109
AOPC21-WSW-5-072821	134	226 *	115	105	104	115	104	106	108
AOPC21-WSW-5-072821	132	196 *	127	98	82	99	95	109	109
AOPC10-WGC2-11-072821	155 *	117	96	90	83	98	94	100	91
AOPC9-W2-12-072821	172 *	129	107	94	97	96	95	98	91
FB-15-072821	116	148	97	97	72	94	92	96	101
WQ12002-001	100	117	93	79	76	80	87	93	88
WQ12002-002	95	100	93	77	58	83	89	94	89
WQ12470-001	92	94	95	86	81	85	90	96	91
WQ12470-002	100	92	96	81	77	86	82	96	93
WQ12076-001	103	108	100	88	85	100	97	99	94
WQ12076-002	118	103	105	97	91	102	95	109	100
WQ12136-001	116	129	101	87	86	90	88	93	95
WQ12136-002	127	113	96	96	89	89	88	99	94
AOPC10-WGC2-11-072821MS	145	117	92	89	88	98	94	99	91
AOPC9-W2-12-072821DUP	161 *	171 *	105	93	88	96	90	91	96

	QC LIMITS
IDS1 = 13C2_4:2FTS	50-150
IDS2 = 13C2_6:2FTS	50-150
IDS3 = 13C2_8:2FTS	50-150
IDS4 = 13C2_PFDoA	50-150
IDS5 = 13C2_PFTeDA	50-150
IDS6 = 13C3_PFBS	50-150
IDS7 = 13C3_PFHxS	50-150
IDS8 = 13C3-HFPO-DA	50-150
IDS9 = 13C4_PFBA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31011

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC2,26-D-072721	94	85	87	79	82	90	77	85	
AOPC4,11-H-072721	106	102	105	92	101	104	99	94	
AOPC1,7-UST29-MW02-072721	101	100	103	92	102	103	92	91	
AOPC1,7-UST29-MW02-072721	112	105	99	104	105	99	104	110	
AOPC1,7-W20-01-072721	83	79	78	75	67	75	69	72	
AOPC1,7-W20-01-072721	95	100	94	93	98	89	96	98	
FB-14-072721	82	87	84	83	75	96	74	79	
AOPC2-PFAS-G-072821	95	107	108	87	78	107	78	90	
AOPC21-WSW-5-072821	113	109	103	102	116	102	102	106	
AOPC21-WSW-5-072821	97	102	102	95	103	117	93	93	
AOPC10-WGC2-11-072821	96	102	111	90	110	92	77	107	
AOPC9-W2-12-072821	98	98	107	90	97	102	90	98	
FB-15-072821	94	99	98	84	103	103	78	101	
WQ12002-001	93	86	90	83	85	96	81	88	
WQ12002-002	90	84	91	84	84	90	88	82	
WQ12470-001	91	98	91	86	92	93	88	90	
WQ12470-002	84	92	91	84	84	92	79	85	
WQ12076-001	105	98	97	87	96	88	83	103	
WQ12076-002	108	105	101	92	101	90	99	110	
WQ12136-001	86	90	96	90	98	93	79	95	
WQ12136-002	89	92	101	81	94	98	82	98	
AOPC10-WGC2-11-072821MS	93	105	110	93	86	99	76	95	
AOPC9-W2-12-072821DUP	93	99	109	88	100	105	84	89	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31011

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC2,26-D-072721	86	86	87						0
AOPC4,11-H-072721	95	95	101						0
AOPC1,7-UST29-MW02-072721	91	94	104						0
AOPC1,7-UST29-MW02-072721	99	102	111						0
AOPC1,7-W20-01-072721	66	70	74						1
AOPC1,7-W20-01-072721	97	95	107						0
FB-14-072721	85	89	86						0
AOPC2-PFAS-G-072821	99	90	90						0
AOPC21-WSW-5-072821	105	121	113						1
AOPC21-WSW-5-072821	105	135	135						1
AOPC10-WGC2-11-072821	91	102	97						1
AOPC9-W2-12-072821	94	106	97						1
FB-15-072821	84	82	90						0
WQ12002-001	94	89	87						0
WQ12002-002	93	83	92						0
WQ12470-001	94	90	98						0
WQ12470-002	89	95	96						0
WQ12076-001	92	98	98						0
WQ12076-002	102	95	108						0
WQ12136-001	84	100	93						0
WQ12136-002	91	99	96						0
AOPC10-WGC2-11-072821MS	90	101	93						0
AOPC9-W2-12-072821DUP	89	110	90						2

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 3
MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31011

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID (Matrix Spike/Matrix Spike Duplicate): AOPC10-WGC2-11-072821

Instrument ID: _Sciex 4500_LCMSMS1 Lab Sample ID: WG31011-008MS

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	SAMPLE CONCENTRATION	MS CONCENTRATION	MS %REC	#	QC LIMITS REC.
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15		19	124		70-150
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15		16	107		70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15		16	102		67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	34	37	21	*	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15		18	121		63-143
Hexafluoropropylene oxide dimer acid (GenX)	32		32	100		70-150
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15		16	104		70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16		15	95		61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16		18	112		65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	37	55	126		72-130
Perfluoro-1-decanesulfonic acid (PFDS)	16		18	113		53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	1.1	19	114		69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15		17	112		69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16		16	100		67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	27	39	78		71-127
Perfluorohexanesulfonic acid (PFHxS)	15	120	130	38	*	68-131
Perfluoro-n-butanoic acid (PFBA)	16	49	65	98		73-129
Perfluoro-n-decanoic acid (PFDA)	16		19	118		71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16		17	106		72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	0.93	19	117		72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	2.1	19	102		72-129
Perfluoro-n-nonanoic acid (PFNA)	16		16	102		69-130
Perfluoro-n-octanoic acid (PFOA)	16	8.3	25	101		71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	2.3	18	96		72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16		18	111		71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16		17	108		65-144
Perfluoro-n-undecanoic acid (PFUdA)	16		19	118		69-133
Perfluorooctanesulfonic acid (PFOS)	15	32	49	117		65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31011

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ12002-002 Lab Sample ID: WQ12002-002

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	13	88	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	16	107	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	17	114	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	17	117	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	17	112	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	15	100	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	33	104	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	15	97	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	18	114	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	15	105	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	12	75	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	17	110	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	16	102	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	16	102	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	15	100	71-127
Perfluoro-n-butanoic acid (PFBA)	16	17	109	73-129
Perfluoro-n-decanoic acid (PFDA)	16	17	104	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	19	118	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	17	106	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	16	103	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	17	104	69-130
Perfluoro-n-octanoic acid (PFOA)	16	17	108	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	17	105	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	18	112	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	17	108	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	19	119	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	15	100	68-131
Perfluorooctanesulfonic acid (PFOS)	15	15	99	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31011

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ12470-002 Lab Sample ID: WQ12470-002

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	14	91	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	17	110	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	15	97	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	13	89	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	18	117	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	15	104	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	30	94	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	14	90	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	15	92	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	14	97	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	16	104	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	16	103	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	16	104	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	17	107	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	15	103	71-127
Perfluoro-n-butanoic acid (PFBA)	16	16	99	73-129
Perfluoro-n-decanoic acid (PFDA)	16	18	110	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	18	111	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	17	108	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	17	105	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	17	105	69-130
Perfluoro-n-octanoic acid (PFOA)	16	17	105	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	16	102	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	16	102	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	16	99	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	17	109	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	15	101	68-131
Perfluorooctanesulfonic acid (PFOS)	15	15	102	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31011

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ12076-002 Lab Sample ID: WQ12076-002

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	15	96	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	15	95	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	20	134	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	16	105	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	17	115	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	16	105	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	32	99	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	17	108	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	17	103	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	17	117	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	15	97	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	17	110	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	15	99	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	16	97	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	16	106	71-127
Perfluoro-n-butanoic acid (PFBA)	16	18	111	73-129
Perfluoro-n-decanoic acid (PFDA)	16	17	108	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	17	109	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	16	102	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	17	106	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	16	102	69-130
Perfluoro-n-octanoic acid (PFOA)	16	18	115	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	18	115	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	18	113	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	17	106	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	16	102	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	17	120	68-131
Perfluorooctanesulfonic acid (PFOS)	15	18	119	65-140

* Values outside of QC Limits

FORM 3
LABORATORY CONTROL/LABORATORY CONTROL DUPLICATE SAMPLE RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WG31011

Project No.: 103IG667601

Analytical Method: PFAS by ID SOP QSM B-15 Matrix: Water

Client Sample ID: WQ12136-002 Lab Sample ID: WQ12136-002

Instrument ID: _Sciex 4500_LCMSMS1

Concentration Units (ug/L, mg/L, ug/kg): ng/L

ANALYTE	SPIKE ADDED	LCS CONCENTRATION	LCS %REC #	QC LIMITS REC.
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	15	16	106	70-150
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	15	14	91	67-138
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	15	16	103	64-140
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	15	13	86	63-143
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	15	16	107	70-150
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	15	15	104	70-150
Hexafluoropropylene oxide dimer acid (GenX)	32	30	93	70-150
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	16	17	103	61-135
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	16	17	105	65-136
Perfluoro-1-butanesulfonic acid (PFBS)	14	15	109	72-130
Perfluoro-1-decanesulfonic acid (PFDS)	15	18	117	53-142
Perfluoro-1-heptanesulfonic acid (PFHpS)	15	17	110	69-134
Perfluoro-1-nonanesulfonic acid (PFNS)	15	17	110	69-127
Perfluoro-1-octanesulfonamide (PFOSA)	16	15	95	67-137
Perfluoro-1-pentanesulfonic acid (PFPeS)	15	17	114	71-127
Perfluoro-n-butanoic acid (PFBA)	16	18	111	73-129
Perfluoro-n-decanoic acid (PFDA)	16	18	113	71-129
Perfluoro-n-dodecanoic acid (PFDoA)	16	17	108	72-134
Perfluoro-n-heptanoic acid (PFHpA)	16	18	114	72-130
Perfluoro-n-hexanoic acid (PFHxA)	16	18	111	72-129
Perfluoro-n-nonanoic acid (PFNA)	16	18	115	69-130
Perfluoro-n-octanoic acid (PFOA)	16	16	99	71-133
Perfluoro-n-pentanoic acid (PFPeA)	16	16	100	72-129
Perfluoro-n-tetradecanoic acid (PFTeDA)	16	19	120	71-132
Perfluoro-n-tridecanoic acid (PFTrDA)	16	18	114	65-144
Perfluoro-n-undecanoic acid (PFUdA)	16	19	120	69-133
Perfluorohexanesulfonic acid (PFHxS)	15	14	95	68-131
Perfluorooctanesulfonic acid (PFOS)	15	16	108	65-140

* Values outside of QC Limits

CLIENT SAMPLE ID

WQ12002-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG31011

Project No.: 103IG667601
Lab Sample ID: WQ12002-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 08/12/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 08/14/2021

Time Analyzed: 21:42

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC2,26-D-072721	WG31011-001		23:29
AOPC4,11-H-072721	WG31011-002		23:39
AOPC1,7-UST29-MW02-072721	WG31011-003		23:50
AOPC1,7-UST29-MW02-072721	WG31011-003		14:08
AOPC1,7-W20-01-072721	WG31011-004		00:01
AOPC1,7-W20-01-072721	WG31011-004		15:11
WQ12002-002	WQ12002-002		21:53

CLIENT SAMPLE ID

WQ12470-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG31011

Project No.: 103IG667601
Lab Sample ID: WQ12470-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 08/18/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 08/20/2021

Time Analyzed: 20:40

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
FB-14-072721	WG31011-005		05:11
AOPC2-PFAS-G-072821	WG31011-006		05:22
AOPC21-WSW-5-072821	WG31011-007		05:33
WQ12470-002	WQ12470-002		20:50

CLIENT SAMPLE ID

WQ12076-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG31011

Project No.: 103IG667601
Lab Sample ID: WQ12076-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 08/13/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 08/16/2021

Time Analyzed: 17:51

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC21-WSW-5-072821	WG31011-007		19:48
WQ12076-002	WQ12076-002		18:01

CLIENT SAMPLE ID

WQ12136-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WG31011

Project No.: 103IG667601
Lab Sample ID: WQ12136-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex 4500_LCMSMS1
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 08/13/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 08/15/2021

Time Analyzed: 21:12

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC10-WGC2-11-072821	WG31011-008		21:33
AOPC9-W2-12-072821	WG31011-009		21:54
FB-15-072821	WG31011-010		22:15
WQ12136-002	WQ12136-002		21:23
AOPC10-WGC2-11-072821MS	WG31011-008MS		21:44
AOPC9-W2-12-072821DUP	WG31011-009DU		22:05

Pace Environmental Services, LLC
Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080421A011.d	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11
2	080421A012.d	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42
3	080421A013.d	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14
4	080421A014.d	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48
5	080421A015.d	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20
6	080421A016.d	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54
7	080421A017.d	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27
8	080421A018.d	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03
9	080421A019.d	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39
10	080421A020.d	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	4.033	3.171	3.299	3.430	3.820	3.711	3.557	3.897	3.591	3.741	3.625	3.008-4.631	0.27062	1.910
1 4:2 FTS	0.891	1.201	1.249	1.294	1.448	1.432	1.630	1.651	1.722	1.544	1.406	0.707-2.188	0.24673	0.724
15 PFHxA	16.400	16.951	18.138	17.471	18.623	16.466	16.283	14.733	16.604	15.436	16.710	15.206-22.039	1.13893	9.311
22 PFPeS	3.682	2.573	3.232	3.249	2.999	3.130	3.255	3.420	3.449	3.425	3.241	2.126-3.871	0.29088	1.499
28 GenX	0.779	0.894	0.847	0.775	0.784	0.721	0.825	0.848	0.876	0.817	0.816	0.631-0.936	0.05085	0.392
13 PFHpA	3.343	3.047	3.094	3.220	3.208	3.050	3.074	3.219	3.087	3.145	3.148	2.930-3.485	0.09255	1.604
14 PFHxS	2.497	3.113	3.475	3.238	3.441	3.687	3.305	3.481	3.357	3.391	3.298	2.507-4.374	0.31131	1.720
29 ADONA	2.703	2.900	2.781	2.592	2.615	2.751	2.814	2.598	2.455	2.410	2.661	2.145-3.084	0.15652	1.307
2 6:2 FTS	1.513	1.571	1.531	1.642	1.410	1.498	1.531	1.417	1.662	1.564	1.533	1.143-1.676	0.08874	0.705
20 PFOA	2.648	3.000	2.914	2.670	2.927	2.689	2.735	2.645	2.767	2.649	2.764	2.443-3.410	0.16101	1.463
12 PFHpS	3.992	2.743	4.088	3.633	3.371	3.686	3.651	3.617	3.498	3.463	3.574	2.240-4.501	0.37695	1.685
18 PFOS	4.368	3.387	4.101	4.056	3.385	4.068	4.464	4.359	4.147	3.600	3.993	2.205-4.564	0.39320	1.692
17 PFNA	4.277	5.432	4.563	5.531	5.471	4.579	5.912	4.929	5.087	4.946	5.072	3.959-6.982	0.50369	2.735
19 PFOSA	44.550	28.005	37.987	41.151	43.685	41.949	38.299	41.733	36.645	40.089	39.409	28.745-58.624	4.97973	21.842
16 PFNS	2.954	3.297	3.405	3.283	3.135	3.386	3.364	3.283	3.061	3.227	3.239	2.683-3.586	0.15053	1.567
3 8:2 FTS	1.193	1.160	1.363	1.325	1.549	1.669	1.589	1.461	1.444	1.578	1.433	1.051-2.046	0.16581	0.774
10 PFDA	12.424	8.307	11.075	10.544	8.897	11.357	10.301	9.792	8.861	10.147	10.170	5.293-12.500	1.20132	4.448
6 N-MeFOSAA	1.556	1.639	1.434	1.626	1.608	1.437	1.513	1.393	1.468	1.468	1.514	1.281-1.934	0.10882	0.804
9 PFDS	3.025	2.485	3.620	3.275	2.663	3.419	3.199	3.142	3.348	3.454	3.163	1.566-3.759	0.36550	1.331
25 PFUdA	8.473	9.114	9.623	8.955	9.871	10.843	10.194	10.404	9.859	10.725	9.806	7.532-12.209	0.77939	4.935
5 N-EtFOSAA	2.076	1.696	2.179	1.687	1.754	1.904	1.864	1.652	1.868	1.687	1.836	1.220-2.287	0.17768	0.877
26 MeFOSA	Disabled	0.997	1.113	1.134	1.040	1.314	1.180	1.050	1.279	1.115	1.135	0.712-1.367	0.10907	0.520
27 EtFOSA	1.236	1.218	1.077	1.025	1.034	1.094	1.116	1.179	1.073	0.995	1.104	0.779-1.288	0.08472	0.517
11 PFDoA	7.722	7.525	7.336	8.224	7.769	7.622	7.936	7.355	8.049	7.517	7.705	6.714-8.823	0.35140	3.884
4 10:2 FTS	2.241	2.570	2.209	2.700	2.445	2.252	2.332	2.202	2.256	2.242	2.344	1.865-3.024	0.19319	1.222
34 PFDOS	2.489	3.402	3.096	3.678	3.453	3.433	3.498	3.289	3.445	3.311	3.309	2.418-4.487	0.34470	1.726
24 PFTrDA	3.424	3.095	3.262	3.145	3.752	3.273	3.319	3.837	3.437	3.629	3.417	2.955-4.548	0.26561	1.876
23 PFTeDA	9.475	8.796	9.372	10.073	10.084	9.239	8.861	9.145	8.835	9.292	9.317	8.565-11.602	0.50623	5.042
35 PFHxDA	15.500	12.334	12.869	13.681	12.750	12.745	13.543	13.451	12.864	12.947	13.268	9.851-15.648	0.96606	6.375
36 PFODA	117.329	88.441	87.472	91.372	99.455	105.511	99.069	96.996	101.048	110.358	99.705	70.901-128.008	9.51794	49.727

Report Date: 05-Aug-2021 13:49:45 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080421A011.d	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11
2	080421A012.d	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42
3	080421A013.d	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14
4	080421A014.d	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48
5	080421A015.d	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20
6	080421A016.d	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54
7	080421A017.d	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27
8	080421A018.d	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03
9	080421A019.d	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39
10	080421A020.d	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	1062	1048	1055	1061	1056	1064	1045	1049	1023	958	Avg:A Wt:C2	1042		RSD=3.1	
	101.9	100.6	101.3	101.8	101.3	102.1	100.3	100.7	98.2	91.9	Org:N Dep:R				
8 PFBA	1.069593	1.116188	1.095136	1.065782	1.041623	1.036417	1.066707	0.992516	0.951316	0.961705	Avg:A Wt:C2	1.039698		RSD=5.3	
	102.9	107.4	105.3	102.5	100.2	99.7	102.6	95.5	91.5	92.5	Org:N Dep:R				
D 50 13C5_PFPeA	1073	955	1019	1030	1049	1064	1071	989	954	943	Avg:A Wt:C2	1015		RSD=5.0	
	105.8	94.1	100.4	101.5	103.4	104.8	105.5	97.5	94	92.9	Org:N Dep:R				
21 PFPeA	1.113265	1.235754	1.164068	1.036911	1.053610	1.013091	1.040276	1.079213	1.018224	0.976648	Avg:A Wt:C2	1.073106		RSD=7.3	
	103.7	115.2	108.5	96.6	98.2	94.4	96.9	100.6	94.9	91	Org:N Dep:R				
D 44 13C3_PFBS	326	320	318	323	314	287	311	314	296	291	Avg:A Wt:C2	310		RSD=4.5	
	105	103.3	102.6	104.2	101.4	92.5	100.4	101.2	95.5	93.7	Org:N Dep:R				
7 PFBS	1.339754	1.185810	1.264375	1.269094	1.373764	1.411099	1.288542	1.338395	1.261518	1.250169	Avg:A Wt:C2	1.298252		RSD=5.1	
	103.2	91.3	97.4	97.8	105.8	108.7	99.3	103.1	97.2	96.3	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	1.999742	1.975003	2.042977	1.948913	1.807651	1.725322	1.831157	1.930616	1.926638	1.838555	Avg:A Wt:C2	1.902657		RSD=5.2	
	105.1	103.8	107.4	102.4	95	90.7	96.2	101.5	101.3	96.6	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	60.3504	64.6138	57.9386	52.7302	55.7984	64.9812	59.1096	55.4398	52.9680	52.0404	Avg:A Wt:C2	57.5970		RSD=8.1	
	104.8	112.2	100.6	91.6	96.9	112.8	102.6	96.3	92	90.4	Org:N Dep:R				
D 49 13C5_PFHxA	938	864	904	953	873	900	958	860	860	780	Avg:A Wt:C2	889		RSD=6.0	
	105.5	97.2	101.7	107.2	98.2	101.2	107.8	96.8	96.7	87.8	Org:N Dep:R				
15 PFHxA	1.065362	1.139650	0.922169	0.995091	1.111061	1.010287	0.925222	0.969699	0.953245	0.913140	Avg:A Wt:C2	1.000493		RSD=8.1	
	106.5	113.9	92.2	99.5	111.1	101	92.5	96.9	95.3	91.3	Org:N Dep:R				
22 PFPeS	0.996613	0.886050	0.897828	0.878917	0.926088	1.042636	0.895091	0.989261	0.976135	0.944894	Avg:A Wt:C2	0.943351		RSD=5.9	
	105.6	93.9	95.2	93.2	98.2	110.5	94.9	104.9	103.5	100.2	Org:N Dep:R				
28 GenX	0.888180	0.968940	0.914139	0.803047	0.826993	0.810443	0.870988	0.898226	0.918201	0.804467	Avg:A Wt:C2	0.870362		RSD=6.6	
	102	111.3	105	92.3	95	93.1	100.1	103.2	105.5	92.4	Org:N Dep:R				
D 66 13C3_GenX	137	133	136	137	122	125	125	121	112	118	Avg:A Wt:C2	127		RSD=6.9	
	108.3	105.1	107.5	108	96.7	98.8	98.4	95.6	88.1	93.6	Org:N Dep:R				
13 PFHpA	0.956811	0.867751	0.896707	0.881725	0.875065	0.897261	0.884850	0.934875	0.900841	0.846155	Avg:A Wt:C2	0.894204		RSD=3.6	
	107	97	100.3	98.6	97.9	100.3	99	104.5	100.7	94.6	Org:N Dep:R				
D 47 13C4_PFHpA	967	971	927	932	933	895	952	900	817	843	Avg:A Wt:C2	914		RSD=5.6	
	105.8	106.3	101.5	102	102.1	98	104.2	98.5	89.4	92.3	Org:N Dep:R				
D 45 13C3_PFHxS	257	251	247	260	254	241	267	254	231	216	Avg:A Wt:C2	248		RSD=6.0	
	103.5	101.2	99.8	105.1	102.7	97.4	107.5	102.4	93.2	87.1	Org:N Dep:R				
14 PFHxS	1.193964	1.125784	1.262319	1.138845	1.171364	1.244612	1.058734	1.127814	1.164460	1.195983	Avg:A Wt:C2	1.168388		RSD=5.1	
	102.2	96.4	108	97.5	100.3	106.5	90.6	96.5	99.7	102.4	Org:N Dep:R				
29 ADONA	5.891676	6.009961	6.412628	6.022446	5.741367	6.114825	5.825974	5.661116	5.810180	5.727135	Avg:A Wt:C2	5.921731		RSD=3.8	
	99.5	101.5	108.3	101.7	97	103.3	98.4	95.6	98.1	96.7	Org:N Dep:R				
2 6:2 FTS	1.857010	2.251216	1.991561	1.962061	1.911024	1.658609	1.810272	1.949022	1.952666	1.827241	Avg:A Wt:C2	1.917068		RSD=8.0	
	96.9	117.4	103.9	102.3	99.7	86.5	94.4	101.7	101.9	95.3	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	53.5660	48.7266	53.2230	51.7098	50.1068	56.5290	52.3614	44.9840	45.4620	45.1060	Avg:A Wt:C2	50.1775		RSD=8.0	
	106.8	97.1	106.1	103.1	99.9	112.7	104.4	89.6	90.6	89.9	Org:N Dep:R				
D 53 13C8_PFOA	917	927	1006	947	920	931	914	877	836	798	Avg:A Wt:C2	907		RSD=6.4	
	101.1	102.2	110.9	104.3	101.4	102.6	100.8	96.7	92.1	88	Org:N Dep:R				
20 PFOA	1.062529	1.068863	1.004984	0.986843	1.064508	0.968555	0.986146	0.969901	0.963871	0.946078	Avg:A Wt:C2	1.002228		RSD=4.6	
	106	106.6	100.3	98.5	106.2	96.6	98.4	96.8	96.2	94.4	Org:N Dep:R				
12 PFHpS	1.032852	0.935592	1.140781	0.999214	0.975659	1.079178	0.953845	0.990193	1.002718	1.009141	Avg:A Wt:C2	1.011917		RSD=6.0	
	102.1	92.5	112.7	98.7	96.4	106.6	94.3	97.9	99.1	99.7	Org:N Dep:R				
D 56 13C9_PFNA	919	939	916	879	904	848	833	822	800	802	Avg:A Wt:C2	866		RSD=6.0	
	106.1	108.4	105.7	101.4	104.4	97.9	96.2	94.9	92.4	92.6	Org:N Dep:R				
D 54 13C8_PFOS	230	237	238	246	219	214	216	217	214	194	Avg:A Wt:C2	223		RSD=6.9	
	103.4	106.6	107	110.5	98.5	96.2	97	97.3	96.2	87.3	Org:N Dep:R				
18 PFOS	1.279182	1.017367	1.118497	1.000925	1.140955	1.190532	1.137854	1.177537	1.145607	1.089138	Avg:A Wt:C2	1.129759		RSD=7.2	
	113.2	90.1	99	88.6	101	105.4	100.7	104.2	101.4	96.4	Org:N Dep:R				
17 PFNA	0.845686	0.846394	0.905171	0.960103	0.960155	0.892432	1.001819	0.922154	0.883469	0.821413	Avg:A Wt:C2	0.903879		RSD=6.4	
	93.6	93.6	100.1	106.2	106.2	98.7	110.8	102	97.7	90.9	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.390300	2.719320	2.946826	2.642292	2.937006	3.094882	3.533645	3.061839	2.961322	3.008653	Avg:A Wt:C2	3.029609		RSD=8.9	
	111.9	89.8	97.3	87.2	96.9	102.2	116.6	101.1	97.7	99.3	Org:N Dep:R				
D 55 13C8_PFOSA	452	447	456	440	428	428	392	411	411	415	Avg:A Wt:C2	428		RSD=4.9	
	105.7	104.4	106.4	102.8	100	100.1	91.6	96	96	97	Org:N Dep:R				
19 PFOSA	1.043774	1.008207	1.054050	1.109229	1.203441	1.105565	1.164264	1.158109	1.086943	0.997277	Avg:A Wt:C2	1.093086		RSD=6.3	
	95.5	92.2	96.4	101.5	110.1	101.1	106.5	105.9	99.4	91.2	Org:N Dep:R				
16 PFNS	0.773371	0.910460	0.927570	0.810264	0.870978	0.941332	0.945937	0.897167	0.882942	0.873268	Avg:A Wt:C2	0.883329		RSD=6.3	
	87.6	103.1	105	91.7	98.6	106.6	107.1	101.6	100	98.9	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	49.5582	46.1166	46.3270	47.9646	47.8918	49.0066	45.6484	43.0064	39.2480	36.2786	Avg:A Wt:C2	45.1046		RSD=9.6	
	109.9	102.2	102.7	106.3	106.2	108.7	101.2	95.3	87	80.4	Org:N Dep:R				
D 51 13C6_PFDA	790	840	819	871	810	775	756	684	661	660	Avg:A Wt:C2	767		RSD=9.8	
	103	109.6	106.8	113.6	105.7	101.1	98.6	89.3	86.3	86.1	Org:N Dep:R				
3 8:2 FTS	2.098711	1.676788	1.876467	1.879474	1.730698	1.775005	1.743521	1.654366	1.624679	1.672599	Avg:A Wt:C2	1.773231		RSD=8.1	
	118.4	94.6	105.8	106	97.6	100.1	98.3	93.3	91.6	94.3	Org:N Dep:R				
10 PFDA	1.229156	0.899680	0.942945	0.882904	0.913501	0.952931	0.942462	0.897689	0.954715	0.876039	Avg:A Wt:C2	0.949202		RSD=10.8	
	129.5	94.8	99.3	93	96.2	100.4	99.3	94.6	100.6	92.3	Org:N Dep:R				
D 58 d3-MeFOSAA	205	200	208	216	232	193	193	200	194	186	Avg:A Wt:C2	203		RSD=6.6	
	101.2	98.7	102.5	106.4	114.3	95.2	95.5	98.7	95.8	91.7	Org:N Dep:R				
6 N-MeFOSAA	0.883721	0.856292	0.808512	0.852573	0.775059	0.876729	0.852609	0.717091	0.796358	0.832583	Avg:A Wt:C2	0.825153		RSD=6.2	
	107.1	103.8	98	103.3	93.9	106.3	103.3	86.9	96.5	100.9	Org:N Dep:R				
9 PFDS	0.997724	0.805639	0.933827	0.921459	0.904412	1.041552	0.974540	0.997938	0.947134	1.021359	Avg:A Wt:C2	0.954558		RSD=7.2	
	104.5	84.4	97.8	96.5	94.7	109.1	102.1	104.5	99.2	107	Org:N Dep:R				
D 60 d5-EtFOSAA	183	201	191	196	192	191	184	174	154	136	Avg:A Wt:C2	180		RSD=11.2	
	101.6	111.4	106.1	108.6	106.3	105.9	102.1	96.7	85.4	75.7	Org:N Dep:R				
D 52 13C7_PFUdA	638	795	808	739	727	720	722	705	626	606	Avg:A Wt:C2	709		RSD=9.6	
	90	112.2	114	104.3	102.6	101.6	101.8	99.5	88.3	85.5	Org:N Dep:R				
25 PFUdA	1.125507	0.840470	0.882786	0.937794	0.925201	0.943945	0.876229	0.915676	0.867638	0.868984	Avg:A Wt:C2	0.918423		RSD=8.7	
	122.5	91.5	96.1	102.1	100.7	102.8	95.4	99.7	94.5	94.6	Org:N Dep:R				
5 N-EtFOSAA	1.014666	1.081996	1.112985	1.015752	0.988404	1.002302	1.062077	1.026670	1.080847	1.127685	Avg:A Wt:C2	1.051338		RSD=4.6	
	96.5	102.9	105.9	96.6	94	95.3	101	97.7	102.8	107.3	Org:N Dep:R				
D 61 d7-MeFOSE	152	138	135	138	129	139	132	126	135	133	Avg:A Wt:C2	136		RSD=5.2	
	111.9	101.7	99.4	101.9	95.2	102.7	97	93	99.1	98.2	Org:N Dep:R				
D 57 d3-MeFOSA	61.4410	58.7850	60.4730	67.1010	58.0220	62.8210	60.2470	61.5940	54.6550	56.5240	Avg:A Wt:C2	60.1663		RSD=5.8	
	102.1	97.7	100.5	111.5	96.4	104.4	100.1	102.4	90.8	93.9	Org:N Dep:R				
32 MeFOSE	1.068864	0.971816	1.112466	1.085730	0.945340	0.953354	1.006529	1.053013	0.938159	0.937151	Avg:A Wt:C2	1.007242		RSD=6.7	
	106.1	96.5	110.4	107.8	93.9	94.6	99.9	104.5	93.1	93	Org:N Dep:R				
26 MeFOSA	Disabled	1.125968	0.956543	1.060729	1.096377	1.048121	1.086969	1.046693	1.337857	1.033636	Avg:A Wt:C2	1.088099		RSD=9.7	
	Disabled	103.5	87.9	97.5	100.8	96.3	99.9	96.2	123	95	Org:N Dep:R				
31 11Cl-PF3OUDS	2.273083	2.250060	2.289270	2.175938	2.482274	2.556557	2.642938	2.685198	2.489184	2.629783	Avg:A Wt:C2	2.447429		RSD=7.6	
	92.9	91.9	93.5	88.9	101.4	104.5	108	109.7	101.7	107.5	Org:N Dep:R				
D 62 d9-EtFOSE	134	136	121	129	126	124	132	134	145	133	Avg:A Wt:C2	131		RSD=5.1	
	102	103.6	92.3	98.2	95.6	94.5	100.6	102.1	110.1	101.1	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	0.834921	0.587630	0.815750	0.750819	0.732426	0.739083	0.754795	0.714281	0.682871	0.708733	Avg:A Wt:C2	0.732131		RSD=9.4	
	114	80.3	111.4	102.6	100	100.9	103.1	97.6	93.3	96.8	Org:N Dep:R				
D 59 d5-EtFOSA	60.5880	62.0700	58.2750	55.2650	61.5170	53.6200	61.7160	56.6060	57.3220	59.9120	Avg:A Wt:C2	58.6891		RSD=5.0	
	103.2	105.8	99.3	94.2	104.8	91.4	105.2	96.5	97.7	102.1	Org:N Dep:R				
27 EtFOSA	1.231597	1.018850	1.180094	1.082711	1.045727	1.166244	1.018060	1.186924	1.020171	0.977408	Avg:A Wt:C2	1.092779		RSD=8.2	
	112.7	93.2	108	99.1	95.7	106.7	93.2	108.6	93.4	89.4	Org:N Dep:R				
D 38 13C2_PFDoA	750	707	696	714	691	749	736	690	706	633	Avg:A Wt:C2	707		RSD=4.9	
	106	100	98.4	101	97.7	106	104.1	97.6	99.8	89.5	Org:N Dep:R				
11 PFDoA	1.056248	1.050965	1.107564	1.016592	0.962042	0.935006	0.928807	0.979876	0.867819	0.908459	Avg:A Wt:C2	0.981338		RSD=7.7	
	107.6	107.1	112.9	103.6	98	95.3	94.6	99.9	88.4	92.6	Org:N Dep:R				
4 10:2 FTS	2.320085	1.803790	2.046050	2.003466	1.939560	1.828274	1.824190	1.845651	1.870927	1.960531	Avg:A Wt:C2	1.944252		RSD=8.0	
	119.3	92.8	105.2	103	99.8	94	93.8	94.9	96.2	100.8	Org:N Dep:R				
34 PFDOS	0.630611	0.761851	0.638148	0.662510	0.750795	0.754911	0.758513	0.735967	0.733974	0.758287	Avg:A Wt:C2	0.718557		RSD=7.4	
	87.8	106	88.8	92.2	104.5	105.1	105.6	102.4	102.1	105.5	Org:N Dep:R				
24 PFTrDA	0.417890	0.408683	0.402150	0.400559	0.461189	0.384950	0.391926	0.463658	0.393263	0.424411	Avg:A Wt:C2	0.414868		RSD=6.7	
	100.7	98.5	96.9	96.6	111.2	92.8	94.5	111.8	94.8	102.3	Org:N Dep:R				
D 42 13C2_PFTeDA	967	877	880	900	788	817	826	901	787	837	Avg:A Wt:C2	858		RSD=6.6	
	112.6	102.2	102.6	104.8	91.9	95.2	96.3	105	91.7	97.6	Org:N Dep:R				
23 PFTeDA	0.819193	0.872608	0.863665	0.811596	0.906066	0.871525	0.844628	0.804179	0.807807	0.788125	Avg:A Wt:C2	0.838939		RSD=4.6	
	97.6	104	102.9	96.7	108	103.9	100.7	95.9	96.3	93.9	Org:N Dep:R				
D 40 13C2_PFHxDA	399	389	394	393	380	396	373	385	363	343	Avg:A Wt:C2	381		RSD=4.6	
	104.7	101.9	103.2	103	99.6	103.7	97.7	101	95.2	89.9	Org:N Dep:R				
35 PFHxDA	2.065872	1.885772	1.766584	1.672608	1.669074	1.667050	1.740511	1.571191	1.629458	1.652842	Avg:A Wt:C2	1.732096		RSD=8.4	
	119.3	108.9	102	96.6	96.4	96.2	100.5	90.7	94.1	95.4	Org:N Dep:R				
36 PFODA	1.104355	1.055476	1.019965	1.032164	1.005032	0.978737	1.049484	1.021000	1.006750	1.068271	Avg:A Wt:C2	1.034123		RSD=3.5	
	106.8	102.1	98.6	99.8	97.2	94.6	101.5	98.7	97.4	103.3	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080421A011.d	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11
2	080421A012.d	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42
3	080421A013.d	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14
4	080421A014.d	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48
5	080421A015.d	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20
6	080421A016.d	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54
7	080421A017.d	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27
8	080421A018.d	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03
9	080421A019.d	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39
10	080421A020.d	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	790264	767044	787237	787735	782059	746942	731398	779788	648667	694404	3.22
* 39 13C2_PFHxA	861612	896067	873937	812948	862203	855542	830784	799064	810887	791574	2.11
* 41 13C2_PFOA	952707	905164	912560	934270	1005174	930606	953869	901253	907967	813545	3.93
* 43 13C3_PFBA	1036502	1026131	1040176	1036824	1060027	1034632	1023793	1017113	990993	927303	2.78
* 48 13C4_PFOS	237004	223749	234551	234522	214696	253380	230899	228368	218107	211791	2.80

13C2_PFDA ((|694404 - 790264| / (694404 + 790264)) / 2) * 100 = 3.23
13C2_PFHxA ((|791574 - 861612| / (791574 + 861612)) / 2) * 100 = 2.12
13C2_PFOA ((|813545 - 952707| / (813545 + 952707)) / 2) * 100 = 3.94
13C3_PFBA ((|927303 - 1036502| / (927303 + 1036502)) / 2) * 100 = 2.78
13C4_PFOS ((|211791 - 237004| / (211791 + 237004)) / 2) * 100 = 2.81

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080421A011.d	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11
2	080421A012.d	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42
3	080421A013.d	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14
4	080421A014.d	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48
5	080421A015.d	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20
6	080421A016.d	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54
7	080421A017.d	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27
8	080421A018.d	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03
9	080421A019.d	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39
10	080421A020.d	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1061824	1048497	1055216	1060737	1055815	1064225	1045265	1049255	1023013	957707	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	56786	117032	231121	565257	1099761	2205961	5574959	10414022	14598133	18420631	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1073150	954891	1018635	1030189	1049419	1063636	1070987	989337	953777	942842	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	59735	118001	237152	534107	1105678	2155120	5570610	10677050	14567380	18416497	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	325666	320437	318169	323188	314416	286882	311270	313835	296214	290646	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	19285	33590	71124	181289	381829	715720	1772793	3713110	4954986	6424145	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	5636	11919	22111	47992	94207	209428	505476	999688	1429723	1787286	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	301752	323069	289693	263651	278992	324906	295548	277199	264840	260202	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	937522	863730	904200	952809	872566	899737	957978	860302	860022	780475	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	861612	896067	873937	812948	862203	855542	830784	799064	810887	791574	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	49940	98435	166765	474066	969474	1817985	4431711	8342341	12297180	14253656	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	15222	26632	53590	133222	273124	561137	1306704	2912160	4068268	5152050	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	12176	25775	49750	109756	202418	405434	1084877	2174440	3073796	3812787	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	685447	665031	680285	683372	611910	625328	622785	605204	557938	592440	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	46249	84274	166333	410750	816513	1606506	4213434	8415577	11038855	14270539	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	966732	971177	927466	931696	933088	895228	952350	900182	816930	843258	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	256510	250785	247421	260335	254408	241439	266501	253867	231072	215785	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	13935	25692	56843	134899	271184	546906	1283799	2605465	3672863	4696967	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	71181	141979	298919	738459	1375932	2781457	7312878	13538147	18970512	23283034	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	4715	10399	20097	48091	90776	177768	449297	831157	1262339	1562674	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	267830	243633	266115	258549	250534	282645	261807	224920	227310	225530	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	952707	905164	912560	934270	1005174	930606	953869	901253	907967	813545	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	917302	927331	1006265	946722	919907	930736	914444	877125	836118	798291	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	48733	99119	202256	467133	979248	1802938	4508876	8507241	12088647	15104917	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	12611	22337	53741	123822	236301	496098	1209995	2393112	3308677	4146104	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	918899	939113	915910	878627	904226	848099	833128	822329	800131	802146	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	230296	237460	238139	246031	219295	214252	215889	216745	214149	194364	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	237004	223749	234551	234522	214696	253380	230899	228368	218107	211791	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	13669	22419	49436	114264	232191	473417	1139817	2368490	3415001	3928953	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	38855	79486	165811	421786	868197	1513742	4173216	7583136	10603362	13177860	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	36384	60182	130807	302940	600274	1235990	3554998	6185108	8865615	10900185	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	452435	446942	455538	439992	428055	428292	391918	410838	411043	415172	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	23612	45061	96032	244026	515139	947009	2281480	4757951	6701702	8280827	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	8549	20755	42411	95688	183361	387230	980244	1866782	2722769	3258850	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	247791	230583	231635	239823	239459	245033	228242	215032	196240	181393	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	790264	767044	787237	787735	782059	746942	731398	779788	648667	694404	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	789859	840354	818526	870690	809951	774689	755954	684467	661374	659800	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	4982	7408	16656	43181	79405	166667	381231	681601	916309	1162620	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	48543	75605	154365	384368	739891	1476450	3562291	6144383	9471354	11560207	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1025663	1000009	1038791	1077796	1157951	964349	967314	999410	970067	929393	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	9064	17126	33595	91890	179496	338189	824741	1433336	2317561	3095186	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	11075	18442	42875	109273	191193	430242	1014092	2085114	2932890	3827379	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	914981	1003747	956100	978556	957645	953784	919765	871299	769444	682126	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	638006	795460	807874	739480	726972	720360	721628	705316	625625	606283	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	35904	66856	142636	346740	672595	1359960	3161556	6458410	8142237	10537000	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	9284	21721	42565	99397	189308	382392	976861	1789073	2494953	3076893	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	151937	138092	134912	138377	129289	139379	131657	126262	134546	133283	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	61441	58785	60473	67101	58022	62821	60247	61594	54655	56524	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	8120	13420	30017	75120	122222	265755	662583	1329555	1893384	2498126	
26 MeFOSA	Disabled	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	Disabled	6619	11569	35588	63614	131688	327433	644700	1096809	1168505	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	24656	50331	102709	252149	512778	1031956	2687438	5482471	7532086	9629785	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	133857	136004	121232	128894	125524	124007	132043	134007	144569	132706	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	5588	7992	19779	48388	91937	183303	498327	957186	1480830	1881063	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	60588	62070	58275	55265	61517	53620	61716	56606	57322	59912	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3731	6324	13754	29918	64330	125068	314153	671870	877174	1171169	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	749862	706979	695910	713972	690580	749290	736381	689878	705767	633260	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	39602	74301	154153	362909	664367	1401182	3419779	6759947	9187170	11505809	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	5542	8019	18275	46318	89545	172744	401368	765173	1061800	1371296	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	7029	17512	29421	78891	159377	313131	792572	1544127	2282251	2853347	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	15668	28893	55972	142994	318488	576878	1443033	3198673	4163285	5375248	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	966561	877141	880006	899595	788343	816826	826364	901166	787053	837206	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	39590	76540	152006	365054	714291	1423769	3489849	7246991	9536800	13196463	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	399473	388801	393641	393052	379801	395692	372724	385384	363249	342928	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	41263	73319	139080	328711	633916	1319277	3243651	6055120	8878486	11336119	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	22058	41037	80300	202847	381712	774557	1955839	3934770	5485514	7326803	

Report Date: 05-Aug-2021 13:49:46 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080421A011.d	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11
2	080421A012.d	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42
3	080421A013.d	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14
4	080421A014.d	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48
5	080421A015.d	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20
6	080421A016.d	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54
7	080421A017.d	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27
8	080421A018.d	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03
9	080421A019.d	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39
10	080421A020.d	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.708	1.708	1.708	1.709	1.708	1.715	1.714	1.709	1.708	1.708	1.709	0.148
8 PFBA	1.708	1.715	1.715	1.715	1.714	1.715	1.714	1.715	1.715	1.714	1.714	0.117
D 50 13C5_PFPeA	2.068	2.068	2.068	2.069	2.068	2.078	2.078	2.068	2.068	2.068	2.070	0.218
21 PFPeA	2.068	2.068	2.068	2.069	2.068	2.078	2.078	2.068	2.068	2.068	2.070	0.218
D 44 13C3_PFBS	2.120	2.131	2.131	2.131	2.120	2.131	2.131	2.131	2.120	2.120	2.126	0.252
7 PFBS	2.131	2.131	2.131	2.131	2.120	2.131	2.131	2.131	2.120	2.120	2.127	0.234
1 4:2 FTS	2.407	2.407	2.407	2.407	2.398	2.407	2.398	2.407	2.398	2.398	2.403	0.196
D 63 13C2_4:2 FTS_2	2.407	2.407	2.407	2.399	2.398	2.407	2.407	2.407	2.398	2.398	2.403	0.187
D 49 13C5_PFHxA	2.441	2.441	2.442	2.442	2.441	2.450	2.450	2.442	2.441	2.441	2.443	0.147
* 39 13C2_PFHxA	2.441	2.441	2.442	2.442	2.441	2.450	2.441	2.451	2.441	2.441	2.443	0.155
15 PFHxA	2.441	2.441	2.442	2.451	2.441	2.450	2.441	2.442	2.441	2.441	2.443	0.155
22 PFPeS	2.476	2.476	2.476	2.477	2.476	2.476	2.485	2.477	2.476	2.476	2.477	0.108
28 GenX	2.563	2.563	2.554	2.563	2.563	2.563	2.563	2.564	2.563	2.563	2.561	0.103
D 66 13C3_GenX	2.563	2.563	2.563	2.563	2.563	2.563	2.563	2.564	2.554	2.563	2.562	0.105
13 PFHpA	2.829	2.828	2.820	2.830	2.819	2.828	2.828	2.821	2.820	2.818	2.824	0.170
D 47 13C4_PFHpA	2.820	2.828	2.820	2.821	2.819	2.828	2.828	2.821	2.820	2.818	2.822	0.150
D 45 13C3_PFHxS	2.837	2.846	2.837	2.839	2.837	2.846	2.846	2.839	2.837	2.836	2.840	0.141
14 PFHxS	2.837	2.846	2.837	2.839	2.837	2.837	2.846	2.839	2.837	2.836	2.839	0.119
29 ADONA	2.864	2.863	2.864	2.865	2.863	2.864	2.863	2.865	2.864	2.862	2.863	0.033
2 6:2 FTS	3.170	3.183	3.176	3.185	3.179	3.183	3.179	3.179	3.172	3.170	3.177	0.163
D 64 13C2_6:2 FTS_2	3.177	3.183	3.182	3.185	3.179	3.177	3.179	3.179	3.172	3.170	3.178	0.145
* 41 13C2_PFOA	3.202	3.202	3.202	3.204	3.198	3.209	3.204	3.204	3.198	3.202	3.202	0.103
D 53 13C8_PFOA	3.209	3.202	3.202	3.210	3.204	3.209	3.204	3.198	3.204	3.202	3.204	0.125
20 PFOA	3.209	3.208	3.202	3.210	3.204	3.209	3.204	3.204	3.198	3.202	3.204	0.128
12 PFHpS	3.209	3.208	3.202	3.210	3.210	3.209	3.210	3.210	3.204	3.208	3.208	0.093
D 56 13C9_PFNA	3.577	3.584	3.576	3.580	3.573	3.586	3.573	3.573	3.580	3.576	3.577	0.130
D 54 13C8_PFOS	3.577	3.569	3.576	3.573	3.573	3.571	3.573	3.565	3.565	3.569	3.571	0.111
* 48 13C4_PFOS	3.569	3.576	3.576	3.573	3.573	3.571	3.573	3.565	3.565	3.569	3.571	0.109
18 PFOS	3.569	3.576	3.569	3.573	3.573	3.571	3.573	3.565	3.573	3.569	3.571	0.086
17 PFNA	3.577	3.576	3.576	3.580	3.580	3.578	3.580	3.573	3.573	3.576	3.577	0.084
30 9Cl-PF3ONS	3.773	3.781	3.778	3.775	3.775	3.774	3.775	3.775	3.775	3.773	3.775	0.059
D 55 13C8_PFOSA	3.854	3.854	3.851	3.856	3.848	3.855	3.856	3.848	3.848	3.846	3.851	0.089
19 PFOSA	3.862	3.854	3.851	3.856	3.856	3.855	3.856	3.848	3.848	3.846	3.853	0.116

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.907	3.906	3.912	3.908	3.908	3.907	3.908	3.901	3.908	3.899	3.906	0.102
D 65 13C2_8:2 FTS_2	3.914	3.914	3.912	3.908	3.908	3.907	3.908	3.908	3.908	3.906	3.909	0.072
* 37 13C2_PFDA	3.922	3.922	3.919	3.916	3.916	3.915	3.916	3.916	3.916	3.914	3.916	0.074
D 51 13C6_PFDA	3.922	3.922	3.919	3.923	3.916	3.915	3.916	3.916	3.916	3.914	3.917	0.090
3 8:2 FTS	3.914	3.922	3.919	3.916	3.916	3.915	3.916	3.908	3.908	3.906	3.914	0.124
10 PFDA	3.914	3.922	3.919	3.923	3.923	3.922	3.923	3.916	3.916	3.914	3.919	0.105
D 58 d3-MeFOSAA	4.074	4.074	4.071	4.077	4.069	4.075	4.069	4.077	4.069	4.066	4.071	0.099
6 N-MeFOSAA	4.082	4.082	4.079	4.077	4.077	4.075	4.077	4.077	4.077	4.074	4.077	0.073
9 PFDS	4.205	4.214	4.211	4.208	4.208	4.206	4.200	4.200	4.200	4.205	4.205	0.114
D 60 d5-EtFOSAA	4.232	4.232	4.228	4.225	4.225	4.224	4.225	4.225	4.225	4.222	4.226	0.077
D 52 13C7_PFUdA	4.214	4.222	4.228	4.225	4.225	4.224	4.217	4.225	4.225	4.222	4.222	0.108
25 PFUdA	4.223	4.232	4.228	4.225	4.225	4.224	4.225	4.225	4.225	4.222	4.225	0.065
5 N-EtFOSAA	4.242	4.241	4.228	4.235	4.235	4.233	4.235	4.235	4.235	4.232	4.234	0.094
D 61 d7-MeFOSE	4.270	4.270	4.266	4.273	4.272	4.271	4.263	4.263	4.263	4.269	4.268	0.086
D 57 d3-MeFOSA	4.279	4.288	4.285	4.291	4.282	4.280	4.282	4.282	4.282	4.288	4.283	0.094
32 MeFOSE	4.279	4.270	4.285	4.273	4.282	4.280	4.282	4.273	4.273	4.279	4.277	0.119
26 MeFOSA	Disabled	4.297	4.294	4.291	4.291	4.290	4.291	4.291	4.291	4.288	4.291	0.064
31 11Cl-PF3OUDS	4.362	4.370	4.367	4.365	4.365	4.363	4.365	4.365	4.356	4.362	4.363	0.090
D 62 d9-EtFOSE	4.426	4.433	4.431	4.429	4.428	4.427	4.429	4.429	4.429	4.426	4.428	0.044
33 EtFOSE	4.440	4.433	4.437	4.442	4.442	4.441	4.442	4.442	4.435	4.439	4.439	0.078
D 59 d5-EtFOSA	4.447	4.446	4.451	4.449	4.449	4.448	4.449	4.449	4.449	4.446	4.448	0.035
27 EtFOSA	4.447	4.453	4.458	4.456	4.456	4.455	4.456	4.456	4.456	4.453	4.454	0.067
D 38 13C2_PFDoA	4.494	4.494	4.499	4.497	4.488	4.495	4.488	4.497	4.497	4.494	4.494	0.075
11 PFDoA	4.494	4.502	4.499	4.488	4.496	4.495	4.488	4.497	4.488	4.494	4.494	0.104
4 10:2 FTS	4.511	4.502	4.507	4.505	4.505	4.504	4.505	4.505	4.505	4.502	4.504	0.051
34 PFDOS	4.712	4.711	4.708	4.706	4.706	4.705	4.706	4.706	4.706	4.704	4.706	0.059
24 PFTrDA	4.736	4.736	4.733	4.737	4.737	4.730	4.731	4.731	4.731	4.730	4.733	0.064
D 42 13C2_PFTeDA	4.952	4.960	4.958	4.956	4.948	4.952	4.956	4.948	4.948	4.951	4.952	0.091
23 PFTeDA	4.960	4.960	4.958	4.956	4.956	4.952	4.956	4.948	4.956	4.951	4.955	0.078
D 40 13C2_PFHxDA	5.343	5.352	5.348	5.347	5.338	5.343	5.347	5.338	5.338	5.334	5.342	0.099
35 PFHxDA	5.352	5.352	5.348	5.347	5.347	5.343	5.347	5.347	5.347	5.343	5.346	0.056
36 PFODA	5.733	5.733	5.723	5.722	5.722	5.725	5.722	5.722	5.715	5.718	5.723	0.099

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A011.d
Injection Date: 04-Aug-2021 14:38:11 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 1 Auto Sampler: 1
Sample Info: ICAL 50_SVLC-1596 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	3	1061824	20	>100:1			1000.00	1018.87	100.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.714	0/-3	56786	17	26:1			50.000	51.438		M
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	3	1073150	15	>100:1			1000.00	1057.62	102.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	3/0	59735	16	51:1			50.000	51.871		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	3	325666	16	>100:1			1000.00	1050.29	103.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.120	4/1	19285	18	>100:1	Target = 3.62		44.200	45.613		
298.9 > 99	44	2.120	2.120		4781	16	24:1	4.03 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	5/2	15222	16	>100:1	Target = 3.24		46.900	49.548		
349 > 99	44	2.476	2.476		4134	25	42:1	3.68 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.398	5	301752	18	>100:1			5000.00	5239.02	108.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.398	5/0	5636	18	80:1	Target = 1.40		46.700	49.083		
327 > 81	63	2.415	2.398		6325	29	16:1	0.89 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	5	937522	18	>100:1			1000.00	1054.66	107.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	5/0	49940	18	51:1	Target = 16.70		50.000	53.242		
313 > 119	49	2.450	2.441		3045	14	17:1	16.40 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	5	685447	19	>100:1			5000.00	5414.50	112	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	5/0	12176	18	67:1	Target = 0.81		100.00	102.05		
285 > 185	66	2.563	2.563		15619	21	42:1	0.77 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.820	2.819	6	966732	19	>100:1			1000.00	1057.91	103.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.829	2.819	6/0	46249	18	83:1	Target = 3.14		50.000	53.501		
363 > 169	47	2.820	2.819		13832	18	59:1	3.34 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.837	2.837	6	256510	17	>100:1			1000.00	1035.10	100.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.837	2.837	6/0	13935	28	64:1	Target = 3.29	0.17	45.500	46.496		
399 > 99	45	2.846	2.837		5580	24	40:1	2.49 (1.64-4.94)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.863	6/0	71181	16	>100:1	Target = 2.66		47.100	46.861		
377 > 85	45	2.864	2.863		26328	18	>100:1	2.70 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.209	3.210	7/1	12611	20	>100:1	Target = 3.57		47.600	48.585		
449 > 99	45	3.209	3.210		3159	15	31:1	3.99 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.177	3.179	5	267830	22	>100:1			5000.00	5337.66	106.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.170	3.179	0/-5	4715	20	27:1	Target = 1.53		47.400	45.915		M
427 > 81	64	3.177	3.179		3116	15	20:1	1.51 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.209	3.204	7	917302	23	>100:1			1000.00	1010.89	99.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.209	3.204	7/0	48733	19	27:1	Target = 2.76		50.000	53.008		
413 > 169	53	3.209	3.204		18400	22	71:1	2.64 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.577	3.573	7	230296	20	>100:1			1000.00	1034.29	105	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.569	3.573	0/-7	13669	36	47:1	Target = 3.99		46.400	52.537		M
499 > 99	54	3.569	3.573		3129	39	18:1	4.36 (1.99-5.98)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.773	3.775	6/-1	36384	24	>100:1			46.600	52.148		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.907	3.908	6/-1	8549	21	53:1	Target = 3.23		48.000	42.025		
549 > 99	54	3.907	3.908		2894	23	14:1	2.95 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.205	4.208	5/-2	11075	20		Target = 3.16		48.200	50.380		
599 > 99	54	4.205	4.208		3660	19	22:1	3.02 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.362	4.365	5/-2	24656	14	>100:1			47.100	43.745		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.712	4.706	2/-5	7029	16	59:1	Target = 3.30		48.400	42.476		
699 > 99	54	4.718	4.706		2823	22	55:1	2.48 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.577	3.573	7	918899	21	>100:1			1000.00	1060.76	101.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.577	3.580	7/0	38855	19	78:1	Target = 5.07		50.000	46.781		
463 > 169	56	3.584	3.580		9083	39	60:1	4.27 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.854	3.848	6	452435	19	>100:1			1000.00	1057.04	105.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													a
498 > 78	55	3.862	3.856	1/-5	23612	18	38:1	Target = 39.40		50.000	47.744		
498>478	55	3.839	3.856		530	13	5.2:1	44.55 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.914	3.908	6	247791	19				5000.00	5493.69	103.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.914	3.916	6/0	4982	12	20:1	Target = 1.43		47.900	56.692		
527 > 81	65	3.914	3.916		4174	22	27:1	1.19 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.511	4.505	5/-1	5542	15	69:1	Target = 2.34		48.200	57.517		
627 > 80	65	4.494	4.505		2473	24	24:1	2.24 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.922	3.916	7	789859	18	>100:1			1000.00	1030.39	97.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.914	3.923	6/-1	48543	18	>100:1	Target = 10.17		50.000	64.747		
513 > 169	51	3.914	3.923		3907	12	27:1	12.42 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.074	4.069	6	1025663	16	>100:1			5000.00	5062.13	88.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.082	4.077	1/-5	9064	32	31:1	Target = 1.51	0.12	50.000	53.549		M
570 > 483	58	4.074	4.077		5822	33	31:1	1.55 (0.75-2.27)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.214	4.225	4	638006	16	>100:1			1000.00	900.25	87.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.223	4.225	5/1	35904	17	83:1	Target = 9.80		50.000	61.274		
563 > 169	52	4.232	4.225		4237	17	19:1	8.47 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.232	4.225	5	914981	19	>100:1			5000.00	5079.03	95.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.242	4.235	1/-4	9284	43	44:1	Target = 1.83		50.000	48.256		M
584 > 526	60	4.251	4.235		4472	32	23:1	2.07 (0.91-2.75)	0.44				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.270	4.272	2	151937	14	>100:1			1000.00	1119.05	117.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.279	4.282	2/0	8120	15	19:1			50.000	53.059		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.279	4.282	5	61441	20	>100:1			1000.00	1021.19	105.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.288	4.291	5/0	5524	19	39:1	Target = 1.13		50.000	82.628		
512 > 219	57	4.288	4.291		2806	15	12:1	1.96 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.426	4.428	4	133857	17	>100:1			1000.00	1019.60	106.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.440	4.442	5/1	5588	12	26:1			50.000	57.020		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.447	4.449	5	60588	17	>100:1			1000.00	1032.36	98.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.447	4.456	0/-5	3731	12	24:1	Target = 1.10		50.000	56.352		M
526 > 219	59	4.454	4.456		3017	23	16:1	1.23 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.494	4.488	4	749862	17	>100:1			1000.00	1060.34	108.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.494	4.496	4/0	39602	17	27:1	Target = 7.70		50.000	53.817		
613 > 169	38	4.494	4.496		5128	14	68:1	7.72 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.736	4.737	4/0	15668	21	48:1	Target = 3.41		50.000	50.364		
663 > 169	38	4.742	4.737		4575	18	80:1	3.42 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.952	4.948	2	966561	16	>100:1			1000.00	1126.49	122.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.960	4.956	3/1	39590	15	21:1	Target = 9.31		50.000	48.823		
713 > 169	42	4.952	4.956		4178	22	50:1	9.47 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.343	5.338	2	399473	17	>100:1			1000.00	1047.18	105.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.352	5.347	2/0	41263	17	>100:1	Target = 13.26		50.000	59.635		
813 > 269	40	5.361	5.347		2662	20	78:1	15.50 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.733	5.722	2/0	22058	23	99:1	Target = 99.70		50.000	53.396		
913 > 319	40	5.726	5.722		188	15	8.7:1	117.32 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.922	3.916	6	790264	18							
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	5	861612	20	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.198	7	952707	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.714	1.714	4	1036502	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.569	3.573	6	237004	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated
a - User Assigned Peak/Hit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A012.d		
Injection Date:	04-Aug-2021 14:48:42	Injection Vol:	10.0 uL
Sample Type:	Ical, Level: 2	Auto Sampler:	2
Sample Info:	ICAL 100_SVLC-1597	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	1	1048497	21	>100:1			1000.00	1006.09	99.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.714	1/0	117032	20	66:1			100.00	107.36		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	954891	15	>100:1			1000.00	941.07	91	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	1/0	118001	15	>100:1			100.00	115.16		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.120	1	320437	17	>100:1			1000.00	1033.43	101.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.120	1/0	33590	15	>100:1	Target = 3.62		88.400	80.744		
298.9 > 99	44	2.131	2.120		10592	16	78:1	3.17 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	1/0	26632	17	>100:1	Target = 3.24		93.800	88.102		
349 > 99	44	2.485	2.476		10347	16	>100:1	2.57 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.398	1	323069	17	>100:1			5000.00	5609.13	115.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.398	1/0	11919	19	>100:1	Target = 1.40		93.400	96.951		
327 > 81	63	2.398	2.398		9918	26	28:1	1.20 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	1	863730	18	>100:1			1000.00	971.65	99	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	1/0	98435	25	98:1	Target = 16.70		100.00	113.91		
313 > 119	49	2.441	2.441		5807	19	28:1	16.95 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	0	665031	18	>100:1			5000.00	5253.23	108.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	0/0	25775	25	>100:1	Target = 0.81		200.00	222.65		
285 > 185	66	2.563	2.563		28812	17	>100:1	0.89 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.828	2.819	1	971177	18	>100:1			1000.00	1062.78	104.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.828	2.819	0/-1	84274	17	>100:1	Target = 3.14		100.00	97.042		
363 > 169	47	2.828	2.819		27653	16	97:1	3.04 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.837	1	250785	19	>100:1			1000.00	1012.00	98.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.837	1/0	25692	27	>100:1	Target = 3.29	0.18	91.000	87.682		
399 > 99	45	2.837	2.837		8253	25	57:1	3.11 (1.64-4.94)	0.08				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.863	0/-1	141979	20	>100:1	Target = 2.66		94.200	95.604		
377 > 85	45	2.863	2.863		48950	17	>100:1	2.90 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.210	0/-1	22337	23	>100:1	Target = 3.57		95.200	88.019		
449 > 99	45	3.215	3.210		8142	26	65:1	2.74 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.183	3.179	1	243633	22	>100:1			5000.00	4855.43	97.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.183	3.179	1/0	10399	21	58:1	Target = 1.53		94.800	111.32		
427 > 81	64	3.183	3.179		6619	29	40:1	1.57 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.204	0	927331	22	>100:1			1000.00	1021.94	100.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.204	0/0	99119	20	61:1	Target = 2.76		100.00	106.65		
413 > 169	53	3.202	3.204		33034	23	>100:1	3.00 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.569	3.573	0	237460	21	>100:1			1000.00	1066.46	108.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.576	3.573	1/1	22419	36	76:1	Target = 3.99	0.28	92.800	83.568		
499 > 99	54	3.576	3.573		6619	33	27:1	3.38 (1.99-5.98)	0.12				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.781	3.775	1/1	60182	23	>100:1			93.200	83.655		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.906	3.908	0/0	20755	22		Target = 3.23		96.000	98.949		
549 > 99	54	3.914	3.908		6294	22	23:1	3.29 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.214	4.208	1/1	18442	14	37:1	Target = 3.16		96.400	81.361		
599 > 99	54	4.214	4.208		7420	22	28:1	2.48 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.370	4.365	1/1	50331	16	>100:1			94.200	86.603		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.711	4.706	0/0	17512	19	>100:1	Target = 3.30		96.800	102.63		
699 > 99	54	4.704	4.706		5147	23	>100:1	3.40 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.584	3.573	1	939113	20	>100:1			1000.00	1084.10	103.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.576	3.580	0/-1	79486	25	>100:1	Target = 5.07		100.00	93.640		
463 > 169	56	3.569	3.580		14631	13	91:1	5.43 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.854	3.848	0	446942	19	>100:1			1000.00	1044.20	104.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.854	3.856	6/6	45061	19	84:1	Target = 39.40		100.00	92.235		
498>478	55	3.854	3.856		1609	14	10:1	28.00 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.914	3.908	0	230583	19				5000.00	5112.18	96.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.922	3.916	1/1	7408	16	36:1	Target = 1.43		95.800	90.590		
527 > 81	65	3.914	3.916		6383	27		1.16 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.502	4.505	0/0	8019	16	42:1	Target = 2.34		96.400	89.436		
627 > 80	65	4.510	4.505		3120	22	40:1	2.57 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.922	3.916	0	840354	19	>100:1			1000.00	1096.26	103.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.922	3.923	1/1	75605	18	>100:1	Target = 10.17		100.00	94.783		
513 > 169	51	3.929	3.923		9101	25	33:1	8.30 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.074	4.069	0	1000009	17	>100:1			5000.00	4935.52	86.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.082	4.077	1/1	17126	40	96:1	Target = 1.51	0.14	100.00	103.77		M
570 > 483	58	4.082	4.077		10444	37	68:1	1.63 (0.75-2.27)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.222	4.225	1	795460	16	>100:1			1000.00	1122.42	109.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.232	4.225	1/0	66856	16	>100:1	Target = 9.80		100.00	91.512		
563 > 169	52	4.222	4.225		7335	13	37:1	9.11 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.232	4.225	0	1003747	16	>100:1			5000.00	5571.76	104.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.241	4.235	1/1	21721	32	>100:1	Target = 1.83	0.12	100.00	102.92		M
584 > 526	60	4.241	4.235		12802	31	67:1	1.69 (0.91-2.75)	0.26				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.270	4.272	0	138092	14	>100:1			1000.00	1017.08	106.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.270	4.282	0/0	13420	21	31:1			100.00	96.483		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.288	4.282	1	58785	14	>100:1			1000.00	977.04	101.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.297	4.291	1/0	6619	20	60:1	Target = 1.13		100.00	103.48		
512 > 219	57	4.288	4.291		6634	15	43:1	0.99 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.433	4.428	1	136004	17	>100:1			1000.00	1035.95	108.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.433	4.442	0/-1	7992	15	28:1			100.00	80.263		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.446	4.449	0	62070	15	>100:1			1000.00	1057.61	100.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.453	4.456	0/0	6324	17	58:1	Target = 1.10		100.00	93.235		M
526 > 219	59	4.453	4.456		5190	16	27:1	1.21 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.494	4.488	0	706979	18	>100:1			1000.00	999.70	102.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.502	4.496	1/1	74301	17	69:1	Target = 7.70		100.00	107.10		
613 > 169	38	4.502	4.496		9873	21	48:1	7.52 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.736	4.737	0/0	28893	18	>100:1	Target = 3.41		100.00	98.509		
663 > 169	38	4.736	4.737		9333	22	>100:1	3.09 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.960	4.948	1	877141	16	>100:1			1000.00	1022.28	111.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.960	4.956	0/-1	76540	15	13:1	Target = 9.31		100.00	104.01		
713 > 169	42	4.960	4.956		8701	20	75:1	8.79 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.352	5.338	1	388801	17	>100:1			1000.00	1019.21	102.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.352	5.347	0/-1	73319	18	>100:1	Target = 13.26		100.00	108.87		
813 > 269	40	5.352	5.347		5944	16	>100:1	12.33 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.733	5.722	0/-1	41037	22	>100:1	Target = 99.70		100.00	102.06		
913 > 319	40	5.740	5.722		464	25	45:1	88.44 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.922	3.916	0	767044	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	1	896067	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.198	0	905164	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.715	1.714	1	1026131	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.576	3.573	1	223749	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A013.d
Injection Date: 04-Aug-2021 14:59:14 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 3 Auto Sampler: 3
Sample Info: ICAL 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	1	1055216	20	>100:1			1000.00	1012.53	99.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.714	1/0	231121	19	>100:1			200.00	210.66		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	1018635	15	>100:1			1000.00	1003.89	97.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	1/0	237152	17	>100:1			200.00	216.95		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.120	1	318169	15	>100:1			1000.00	1026.11	101.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.120	1/0	71124	16	>100:1	Target = 3.62		176.80	172.19		
298.9 > 99	44	2.120	2.120		21553	18	>100:1	3.29 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	1/0	53590	25	>100:1	Target = 3.24		187.60	178.55		
349 > 99	44	2.476	2.476		16580	18	>100:1	3.23 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.398	1	289693	18	>100:1			5000.00	5029.65	103.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.398	1/0	22111	18	>100:1	Target = 1.40		186.80	200.58		
327 > 81	63	2.398	2.398		17701	27	>100:1	1.24 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.441	1	904200	18	>100:1			1000.00	1017.17	103.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.441	1/0	166765	18	>100:1	Target = 16.70		200.00	184.34		
313 > 119	49	2.442	2.441		9194	15	93:1	18.13 (8.35-25.06)					M
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	680285	18	>100:1			5000.00	5373.72	111.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.554	2.563	0/-1	49750	22	>100:1	Target = 0.81		400.00	420.12		
285 > 185	66	2.563	2.563		58698	17	>100:1	0.84 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.820	2.819	0	927466	19	>100:1			1000.00	1014.94	99.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.820	2.819	0/0	166333	18	>100:1	Target = 3.14		200.00	200.56		
363 > 169	47	2.820	2.819		53753	19	>100:1	3.09 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.837	2.837	0	247421	18	>100:1			1000.00	998.42	97.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.837	2.837	0/0	56843	26	>100:1	Target = 3.29	0.17	182.00	196.63		
399 > 99	45	2.837	2.837		16357	27	>100:1	3.47 (1.64-4.94)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.863	1/1	298919	19	>100:1	Target = 2.66		188.40	204.02		
377 > 85	45	2.864	2.863		107485	17	>100:1	2.78 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.202	3.210	0/0	53741	21	>100:1	Target = 3.57		190.40	214.65		
449 > 99	45	3.208	3.210		13146	20	>100:1	4.08 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.182	3.179	1	266115	28	>100:1			5000.00	5303.48	106.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.176	3.179	1/0	20097	19	>100:1	Target = 1.53		189.60	196.97		
427 > 81	64	3.189	3.179		13124	39	89:1	1.53 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.204	0	1006265	22	>100:1			1000.00	1108.92	109.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.204	0/0	202256	23	>100:1	Target = 2.76		200.00	200.55		
413 > 169	53	3.208	3.204		69400	29	>100:1	2.91 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.576	3.573	1	238139	19	>100:1			1000.00	1069.51	108.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.569	3.573	0/-1	49436	43	>100:1	Target = 3.99	0.24	185.60	183.75		M
499 > 99	54	3.576	3.573		12053	34	62:1	4.10 (1.99-5.98)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.778	3.775	1/0	130807	20	>100:1			186.40	181.31		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.912	3.908	1/0	42411	18	>100:1	Target = 3.23		192.00	201.62		
549 > 99	54	3.912	3.908		12454	19	55:1	3.40 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.211	4.208	1/0	42875	16	>100:1	Target = 3.16		192.80	188.61		
599 > 99	54	4.211	4.208		11841	21	72:1	3.62 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.367	4.365	1/0	102709	15	>100:1			188.40	176.23		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.708	4.706	0/-1	29421	17	>100:1	Target = 3.30		193.60	171.94		
699 > 99	54	4.708	4.706		9502	18	>100:1	3.09 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.576	3.573	0	915910	20	>100:1			1000.00	1057.31	101.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.576	3.580	1/1	165811	19	>100:1	Target = 5.07		200.00	200.29		
463 > 169	56	3.583	3.580		36337	19	>100:1	4.56 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.851	3.848	0	455538	19	>100:1			1000.00	1064.29	106.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.851	3.856	0/0	96032	18	>100:1	Target = 39.40		200.00	192.86		
498>478	55	3.844	3.856		2528	21	19:1	37.98 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.912	3.908	0	231635	18				5000.00	5135.50	96.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.919	3.916	1/1	16656	19	72:1	Target = 1.43		191.60	202.75		
527 > 81	65	3.919	3.916		12216	14	>100:1	1.36 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.507	4.505	1/1	18275	14	>100:1	Target = 2.34		192.80	202.89		
627 > 80	65	4.507	4.505		8272	17	>100:1	2.20 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.919	3.916	0	818526	18	>100:1			1000.00	1067.78	101.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.919	3.923	1/1	154365	20	>100:1	Target = 10.17		200.00	198.68		
513 > 169	51	3.919	3.923		13937	19	83:1	11.07 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.071	4.069	0	1038791	16	>100:1			5000.00	5126.92	89.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.079	4.077	1/1	33595	35		Target = 1.51	0.11	200.00	195.97		M
570 > 483	58	4.079	4.077		23419	30	>100:1	1.43 (0.75-2.27)	0.22				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.228	4.225	1	807874	15	>100:1			1000.00	1139.94	111.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.228	4.225	1/0	142636	16	>100:1	Target = 9.80		200.00	192.24		
563 > 169	52	4.228	4.225		14821	21		9.62 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.228	4.225	0	956100	17	>100:1			5000.00	5307.28	99.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.228	4.235	0/0	42565	35	>100:1	Target = 1.83		200.00	211.73		M
584 > 526	60	4.238	4.235		19529	32	>100:1	2.17 (0.91-2.75)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.266	4.272	0	134912	14	>100:1			1000.00	993.66	104.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.285	4.282	1/1	30017	15	79:1			200.00	220.89		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.285	4.282	1	60473	13	>100:1			1000.00	1005.10	104.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.294	4.291	1/0	11569	11	51:1	Target = 1.13		200.00	175.82		
512 > 219	57	4.294	4.291		10389	14	60:1	1.11 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.431	4.428	1	121232	23	>100:1			1000.00	923.43	96.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.437	4.442	0/-1	19779	17	78:1			200.00	222.84		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.451	4.449	1	58275	16	>100:1			1000.00	992.94	94.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.458	4.456	1/0	13754	14	98:1	Target = 1.10		200.00	215.98		
526 > 219	59	4.451	4.456		12763	16	59:1	1.07 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.499	4.488	1	695910	17	>100:1			1000.00	984.05	100.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.499	4.496	1/0	154153	17	58:1	Target = 7.70		200.00	225.73		
613 > 169	38	4.499	4.496		21011	16	>100:1	7.33 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.733	4.737	0/-1	55972	20	>100:1	Target = 3.41		200.00	193.87		
663 > 169	38	4.733	4.737		17158	19	>100:1	3.26 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.958	4.948	1	880006	16	>100:1			1000.00	1025.62	111.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.958	4.956	0/-1	152006	16	23:1	Target = 9.31		200.00	205.89		
713 > 169	42	4.958	4.956		16218	15	>100:1	9.37 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.348	5.338	1	393641	17	>100:1			1000.00	1031.89	103.6	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.348	5.347	0/-1	139080	16	14:1	Target = 13.26		200.00	203.98		
813 > 269	40	5.348	5.347		10807	20	>100:1	12.86 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.723	5.722	0/-1	80300	22	11:1	Target = 99.70		200.00	197.26		
913 > 319	40	5.723	5.722		918	29	96:1	87.47 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.919	3.916	0	787237	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.441	1	873937	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.198	0	912560	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.714	0	1040176	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.576	3.573	1	234551	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A014.d
Injection Date: 04-Aug-2021 15:09:48 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 4 Auto Sampler: 4
Sample Info: ICAL 500_SVLC-1599 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.709	1.708	1	1060737	20	>100:1			1000.00	1017.83	100.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.714	1/0	565257	20	>100:1			500.00	512.54		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.069	2.068	1	1030189	16	>100:1			1000.00	1015.28	98.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.069	2.068	1/0	534107	17	>100:1			500.00	483.14		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.120	1	323188	15	>100:1			1000.00	1042.30	102.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.120	1/0	181289	16	>100:1	Target = 3.62		442.00	432.07		
298.9 > 99	44	2.131	2.120		52845	15	>100:1	3.43 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.476	1/0	133222	19	>100:1	Target = 3.24		469.00	436.97		
349 > 99	44	2.477	2.476		41003	17	>100:1	3.24 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.399	2.398	0	263651	18	>100:1			5000.00	4577.51	94.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.398	1/1	47992	19	>100:1	Target = 1.40		467.00	478.35		
327 > 81	63	2.399	2.398		37082	21	>100:1	1.29 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.441	1	952809	18	>100:1			1000.00	1071.86	109.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.451	2.441	1/0	474066	18	>100:1	Target = 16.70		500.00	497.30		
313 > 119	49	2.442	2.441		27133	20	>100:1	17.47 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	683372	18	>100:1			5000.00	5398.10	111.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	1/0	109756	19	>100:1	Target = 0.81		1000.00	922.66		
285 > 185	66	2.563	2.563		141527	22	>100:1	0.77 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.821	2.819	0	931696	19	>100:1			1000.00	1019.57	99.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.830	2.819	1/1	410750	17	>100:1	Target = 3.14		500.00	493.02		
363 > 169	47	2.821	2.819		127529	18	>100:1	3.22 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.839	2.837	0	260335	17	>100:1			1000.00	1050.53	102.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.839	2.837	0/0	134899	27	>100:1	Target = 3.29	0.18	455.00	443.50		
399 > 99	45	2.839	2.837		41656	26	>100:1	3.23 (1.64-4.94)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.865	2.863	1/1	738459	17	>100:1	Target = 2.66		471.00	479.01		
377 > 85	45	2.865	2.863		284794	19	>100:1	2.59 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.210	3.210	1/1	123822	24	>100:1	Target = 3.57		476.00	470.02		
449 > 99	45	3.210	3.210		34081	20	>100:1	3.63 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.185	3.179	1	258549	23	>100:1			5000.00	5152.69	103.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.185	3.179	1/0	48091	25	>100:1	Target = 1.53		474.00	485.12		
427 > 81	64	3.179	3.179		29272	19	>100:1	1.64 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.210	3.204	1	946722	23	>100:1			1000.00	1043.31	102.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.210	3.204	1/0	467133	22	>100:1	Target = 2.76		500.00	492.32		
413 > 169	53	3.204	3.204		174937	23	>100:1	2.67 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.573	3.573	0	246031	20	>100:1			1000.00	1104.95	112.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.573	3.573	0/0	114264	39	>100:1	Target = 3.99	0.23	464.00	411.09		M
499 > 99	54	3.573	3.573		28170	39	>100:1	4.05 (1.99-5.98)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.775	0/0	302940	19	>100:1			466.00	406.42		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.908	1/1	95688	19	>100:1	Target = 3.23		480.00	440.30		
549 > 99	54	3.908	3.908		29138	16	>100:1	3.28 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.208	0/0	109273	22		Target = 3.16		482.00	465.29		
599 > 99	54	4.200	4.208		33359	17	>100:1	3.27 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.365	0/0	252149	15	>100:1			471.00	418.75		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.706	4.706	0/0	78891	18	>100:1	Target = 3.30		484.00	446.25		
699 > 99	54	4.706	4.706		21444	18	>100:1	3.67 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.580	3.573	1	878627	20	>100:1			1000.00	1014.28	97.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.580	3.580	1/0	421786	19	>100:1	Target = 5.07		500.00	531.10		
463 > 169	56	3.580	3.580		76250	20	>100:1	5.53 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.856	3.848	1	439992	20	>100:1			1000.00	1027.96	102.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.856	1/0	244026	18	>100:1	Target = 39.40		500.00	507.38		
498>478	55	3.841	3.856		5930	23	47:1	41.15 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	0	239823	19				5000.00	5317.04	100.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.916	3.916	0/0	43181	21	>100:1	Target = 1.43		479.00	507.70		
527 > 81	65	3.916	3.916		32575	18	>100:1	1.32 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.505	4.505	0/0	46318	17	>100:1	Target = 2.34		482.00	496.68		
627 > 80	65	4.505	4.505		17150	16	>100:1	2.70 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.923	3.916	1	870690	18	>100:1			1000.00	1135.83	107.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.923	3.923	1/0	384368	18	>100:1	Target = 10.17		500.00	465.08		
513 > 169	51	3.923	3.923		36453	16	>100:1	10.54 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.069	1	1077796	16	>100:1			5000.00	5319.43	93.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	1/0	91890	36	>100:1	Target = 1.51	0.07	500.00	516.62		M
570 > 483	58	4.069	4.077		56479	35	>100:1	1.62 (0.75-2.27)	0.21				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.225	1	739480	15	>100:1			1000.00	1043.43	101.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.225	0/-1	346740	16	>100:1	Target = 9.80		500.00	510.55		
563 > 169	52	4.225	4.225		38718	20	>100:1	8.95 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.225	0	978556	17	>100:1			5000.00	5431.93	102.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.235	1/1	99397	35	>100:1	Target = 1.83		500.00	483.08		M
584 > 526	60	4.235	4.235		58896	34	>100:1	1.68 (0.91-2.75)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.273	4.272	1	138377	24	>100:1			1000.00	1019.18	107	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.273	4.282	0/-1	75120	15	>100:1			500.00	538.96		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.291	4.282	1	67101	14	97:1			1000.00	1115.26	115.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.291	4.291	0/-1	35588	22	34:1	Target = 1.13		500.00	487.42		
512 > 219	57	4.291	4.291		31363	15	>100:1	1.13 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.429	4.428	0	128894	16	>100:1			1000.00	981.79	102.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.442	4.442	1/1	48388	23	>100:1			500.00	512.76		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.449	4.449	1	55265	17	>100:1			1000.00	941.66	89.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.456	4.456	1/0	29918	21	>100:1	Target = 1.10		500.00	495.39		
526 > 219	59	4.456	4.456		29166	18	>100:1	1.02 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.497	4.488	1	713972	16	>100:1			1000.00	1009.59	103.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.488	4.496	0/-1	362909	17	>100:1	Target = 7.70		500.00	517.96		
613 > 169	38	4.497	4.496		44125	16	>100:1	8.22 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.737	4.737	1/0	142994	21	>100:1	Target = 3.41		500.00	482.76		
663 > 169	38	4.737	4.737		45465	21	>100:1	3.14 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.956	4.948	1	899595	16	>100:1			1000.00	1048.45	114.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.956	4.956	0/-1	365054	17	59:1	Target = 9.31		500.00	483.70		
713 > 169	42	4.948	4.956		36240	19	>100:1	10.07 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.347	5.338	0	393052	17	>100:1			1000.00	1030.35	103.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.347	0/0	328711	18	28:1	Target = 13.26		500.00	482.83		
813 > 269	40	5.347	5.347		24026	18	>100:1	13.68 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.722	5.722	0/0	202847	22	28:1	Target = 99.70		500.00	499.05		
913 > 319	40	5.722	5.722		2220	26	>100:1	91.37 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.916	3.916	0	787735	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.441	1	812948	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.204	3.198	1	934270	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.715	1.714	1	1036824	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.573	3.573	0	234522	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A015.d
Injection Date: 04-Aug-2021 15:20:20 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 5 Auto Sampler: 5
Sample Info: ICAL 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	1	1055815	20	>100:1			1000.00	1013.11	100	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.714	1.714	1/0	1099761	21	>100:1			1000.00	1001.85		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	1049419	15	>100:1			1000.00	1034.23	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	1/0	1105678	17	>100:1			1000.00	981.83		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	0	314416	17	>100:1			1000.00	1014.01	100	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.120	0/0	381829	16	>100:1	Target = 3.62		884.00	935.42		
298.9 > 99	44	2.131	2.120		99940	17	>100:1	3.82 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	1/1	273124	19	>100:1	Target = 3.24		938.00	920.83		
349 > 99	44	2.476	2.476		91059	20	>100:1	2.99 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	278992	19	>100:1			5000.00	4843.86	100	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	0/0	94207	19	>100:1	Target = 1.40		934.00	887.36		
327 > 81	63	2.398	2.398		65049	25	>100:1	1.44 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	1	872566	18	>100:1			1000.00	981.59	100	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	0/-1	969474	18	>100:1	Target = 16.70		1000.00	1110.51		
313 > 119	49	2.441	2.441		52057	20	>100:1	18.62 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	611910	20	>100:1			5000.00	4833.61	100	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	1/0	202418	19	>100:1	Target = 0.81		2000.00	1900.34		
285 > 185	66	2.563	2.563		257949	19	>100:1	0.78 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.819	2.819	0	933088	18	>100:1			1000.00	1021.10	100	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.819	2.819	0/0	816513	19	>100:1	Target = 3.14		1000.00	978.60		
363 > 169	47	2.819	2.819		254519	18	>100:1	3.20 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.837	2.837	0	254408	18	>100:1			1000.00	1026.62	100	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.837	2.837	0/0	271184	26	>100:1	Target = 3.29	0.17	910.00	912.32		
399 > 99	45	2.837	2.837		78796	24	>100:1	3.44 (1.64-4.94)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.863	0/0	1375932	19	>100:1	Target = 2.66		942.00	913.31		
377 > 85	45	2.863	2.863		526133	19	>100:1	2.61 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.210	3.210	1/1	236301	21	>100:1	Target = 3.57		952.00	917.89		
449 > 99	45	3.210	3.210		70091	21	>100:1	3.37 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.179	3.179	0	250534	23	>100:1			5000.00	4992.96	100	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.179	3.179	1/1	90776	20	>100:1	Target = 1.53		948.00	945.01		
427 > 81	64	3.179	3.179		64378	22	>100:1	1.41 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.204	3.204	0	919907	22	>100:1			1000.00	1013.76	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.204	3.204	0/0	979248	22	>100:1	Target = 2.76		1000.00	1062.14		
413 > 169	53	3.198	3.204		334529	23	>100:1	2.92 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.573	3.573	0	219295	19	>100:1			1000.00	984.88	100	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.573	3.573	0/0	232191	42	>100:1	Target = 3.99	0.25	928.00	937.20		M
499 > 99	54	3.573	3.573		68577	42	>100:1	3.38 (1.99-5.98)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.775	0/0	600274	19	>100:1			932.00	903.51		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.908	1/1	183361	18	>100:1	Target = 3.23		960.00	946.58		
549 > 99	54	3.908	3.908		58483	18	>100:1	3.13 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.208	0/0	191193	15		Target = 3.16		964.00	913.36		
599 > 99	54	4.199	4.208		71772	16	>100:1	2.66 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.365	0/0	512778	15	>100:1			942.00	955.41		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.706	4.706	0/0	159377	17	>100:1	Target = 3.30		968.00	1011.43		
699 > 99	54	4.706	4.706		46146	19	>100:1	3.45 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.573	3.573	0	904226	19	>100:1			1000.00	1043.83	100	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.580	3.580	1/1	868197	21	>100:1	Target = 5.07		1000.00	1062.26		
463 > 169	56	3.573	3.580		158670	20	>100:1	5.47 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	0	428055	19	>100:1			1000.00	1000.08	100	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.856	1/1	515139	20	>100:1	Target = 39.40		1000.00	1100.96		
498>478	55	3.848	3.856		11792	18	85:1	43.68 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	0	239459	19	>100:1			5000.00	5308.97	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.916	3.916	0/0	79405	18	>100:1	Target = 1.43		958.00	935.02		
527 > 81	65	3.916	3.916		51239	18	>100:1	1.54 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.505	4.505	0/0	89545	17	>100:1	Target = 2.34		964.00	961.67		
627 > 80	65	4.505	4.505		36611	18	>100:1	2.44 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.916	0	809951	19	>100:1			1000.00	1056.60	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.923	3.923	1/1	739891	19	>100:1	Target = 10.17		1000.00	962.39		
513 > 169	51	3.916	3.923		83155	20	>100:1	8.89 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.069	0	1157951	16	>100:1			5000.00	5715.03	100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	0/0	179496	32	>100:1	Target = 1.51		1000.00	939.29		M
570 > 483	58	4.077	4.077		111623	32	>100:1	1.60 (0.75-2.27)	0.19				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.225	1	726972	16	>100:1			1000.00	1025.78	100	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.225	0/-1	672595	18	>100:1	Target = 9.80		1000.00	1007.38		
563 > 169	52	4.225	4.225		68133	17	>100:1	9.87 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.225	0	957645	17	>100:1			5000.00	5315.85	100	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.235	0/0	189308	35	>100:1	Target = 1.83	0.07	1000.00	940.14		M
584 > 526	60	4.235	4.235		107929	32	>100:1	1.75 (0.91-2.75)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.272	4.272	1	129289	15	>100:1			1000.00	952.24	100	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.282	1/0	122222	17	>100:1			1000.00	938.54		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.282	4.282	0	58022	14	>100:1			1000.00	964.36	100	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.291	4.291	0/0	63614	15	63:1	Target = 1.13		1000.00	1007.61		
512 > 219	57	4.291	4.291		61156	22	>100:1	1.04 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.428	4.428	0	125524	16	>100:1			1000.00	956.12	100	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.442	4.442	1/1	91937	16	>100:1			1000.00	1000.40		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.449	4.449	1	61517	25	>100:1			1000.00	1048.18	100	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.456	4.456	1/0	64330	19	>100:1	Target = 1.10		1000.00	956.94		
526 > 219	59	4.456	4.456		62162	18	>100:1	1.03 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.488	4.488	0	690580	18	>100:1			1000.00	976.52	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.496	4.496	1/1	664367	16	>100:1	Target = 7.70		1000.00	980.34		
613 > 169	38	4.496	4.496		85510	16	>100:1	7.76 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.737	4.737	1/1	318488	19	>100:1	Target = 3.41		1000.00	1111.65		
663 > 169	38	4.731	4.737		84870	19	>100:1	3.75 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.948	4.948	0	788343	17	>100:1			1000.00	918.79	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.956	4.956	0/0	714291	16	>100:1	Target = 9.31		1000.00	1080.01		
713 > 169	42	4.948	4.956		70832	17	>100:1	10.08 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.338	5.338	0	379801	17	>100:1			1000.00	995.61	100	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.347	0/0	633916	18	55:1	Target = 13.26		1000.00	963.62		
813 > 269	40	5.347	5.347		49716	18	>100:1	12.75 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.722	5.722	0/0	381712	23	53:1	Target = 99.70		1000.00	971.87		
913 > 319	40	5.722	5.722		3838	20	>100:1	99.45 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.916	3.916	0	782059	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	1	862203	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.198	3.198	0	1005174	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.714	1.714	1	1060027	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.573	3.573	0	214696	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A016.d
Injection Date: 04-Aug-2021 15:30:54 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 6 Auto Sampler: 6
Sample Info: ICAL 2000_SVLC-1601 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.708	1	1064225	20	>100:1			1000.00	1021.18	100.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.714	1/0	2205961	20	>100:1			2000.00	1993.69		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.078	2.068	1	1063636	16	>100:1			1000.00	1048.24	101.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.078	2.068	1/0	2155120	17	>100:1			2000.00	1888.15		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.120	1	286882	16	>100:1			1000.00	925.21	91.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.120	1/0	715720	16	>100:1	Target = 3.62		1768.00	1921.68		
298.9 > 99	44	2.131	2.120		192837	15	>100:1	3.71 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	1/0	561137	18	>100:1	Target = 3.24		1876.00	2073.44		
349 > 99	44	2.476	2.476		179241	19	>100:1	3.13 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.398	1	324906	18	>100:1			5000.00	5641.02	116.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.398	1/0	209428	18	>100:1	Target = 1.40		1868.00	1693.89		
327 > 81	63	2.407	2.398		146159	17	>100:1	1.43 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.441	1	899737	17	>100:1			1000.00	1012.15	103.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.441	1/0	1817985	20	>100:1	Target = 16.70		2000.00	2019.58		
313 > 119	49	2.450	2.441		110403	18	>100:1	16.46 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	625328	18	>100:1			5000.00	4939.60	102.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	1/0	405434	19	>100:1	Target = 0.81		4000.00	3724.62		
285 > 185	66	2.563	2.563		561818	19	>100:1	0.72 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.828	2.819	1	895228	18	>100:1			1000.00	979.66	95.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.828	2.819	1/0	1606506	18	>100:1	Target = 3.14		2000.00	2006.84		
363 > 169	47	2.828	2.819		526556	18	>100:1	3.05 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.837	1	241439	18	>100:1			1000.00	974.28	94.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.837	2.837	1/0	546906	28	>100:1	Target = 3.29	0.17	1820.00	1938.73		
399 > 99	45	2.846	2.837		148298	22	>100:1	3.68 (1.64-4.94)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.863	1/0	2781457	18	>100:1	Target = 2.66		1884.00	1945.43		
377 > 85	45	2.864	2.863		1010942	18	>100:1	2.75 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.209	3.210	0/-1	496098	21	>100:1	Target = 3.57		1904.00	2030.56		
449 > 99	45	3.209	3.210		134568	22	>100:1	3.68 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.177	3.179	0	282645	21	>100:1			5000.00	5632.91	112.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.183	3.179	1/1	177768	22		Target = 1.53		1896.00	1640.38		
427 > 81	64	3.183	3.179		118631	21	>100:1	1.49 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.209	3.204	1	930736	21	>100:1			1000.00	1025.69	101.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.209	3.204	1/0	1802938	22	>100:1	Target = 2.76		2000.00	1932.80		
413 > 169	53	3.209	3.204		670250	22	>100:1	2.68 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.571	3.573	0	214252	19	>100:1			1000.00	962.23	97.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.571	3.573	0/0	473417	43	>100:1	Target = 3.99	0.28	1856.00	1955.84		M
499 > 99	54	3.578	3.573		116364	36	>100:1	4.06 (1.99-5.98)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.774	3.775	0/0	1235990	19	>100:1			1864.00	1904.16		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.907	3.908	0/0	387230	18	>100:1	Target = 3.23		1920.00	2046.08		
549 > 99	54	3.907	3.908		114339	16	>100:1	3.38 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.206	4.208	0/0	430242	21	>100:1	Target = 3.16		1928.00	2103.71		
599 > 99	54	4.206	4.208		125834	17	>100:1	3.41 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.363	4.365	0/0	1031956	15	>100:1			1884.00	1968.01		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.705	4.706	0/0	313131	18	>100:1	Target = 3.30		1936.00	2033.95		
699 > 99	54	4.705	4.706		91209	18		3.43 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.586	3.573	1	848099	21	>100:1			1000.00	979.03	93.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.578	3.580	0/-1	1513742	19	>100:1	Target = 5.07		2000.00	1974.67		
463 > 169	56	3.578	3.580		330568	19	>100:1	4.57 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.855	3.848	1	428292	19	>100:1			1000.00	1000.63	100.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.855	3.856	0/-1	947009	19	>100:1	Target = 39.40		2000.00	2022.83		
498>478	55	3.847	3.856		22575	23	>100:1	41.94 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.907	3.908	0	245033	18	>100:1			5000.00	5432.55	102.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.915	3.916	0/0	166667	17	>100:1	Target = 1.43		1916.00	1917.92		
527 > 81	65	3.907	3.916		99841	19	>100:1	1.66 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.504	4.505	0/0	172744	17		Target = 2.34		1928.00	1812.99		
627 > 80	65	4.504	4.505		76683	15		2.25 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.915	3.916	0	774689	17	>100:1			1000.00	1010.60	95.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.922	3.923	0/0	1476450	18	>100:1	Target = 10.17		2000.00	2007.86		
513 > 169	51	3.922	3.923		129998	18	>100:1	11.35 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.075	4.069	1	964349	16	>100:1			5000.00	4759.52	83.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.075	4.077	0/-1	338189	34	>100:1	Target = 1.51	0.07	2000.00	2125.01		M
570 > 483	58	4.075	4.077		235231	33	>100:1	1.43 (0.75-2.27)	0.13				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.224	4.225	0	720360	16	>100:1			1000.00	1016.45	99.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.224	4.225	0/0	1359960	17	>100:1	Target = 9.80		2000.00	2055.58		
563 > 169	52	4.224	4.225		125416	18	>100:1	10.84 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.224	4.225	0	953784	18	>100:1			5000.00	5294.42	99.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.233	4.235	0/0	382392	35	>100:1	Target = 1.83		2000.00	1906.72		M
584 > 526	60	4.233	4.235		200758	31	>100:1	1.90 (0.91-2.75)	0.22				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.271	4.272	0	139379	13	>100:1			1000.00	1026.56	107.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.280	4.282	0/0	265755	15	>100:1			2000.00	1893.00		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.280	4.282	0	62821	14	>100:1			1000.00	1044.12	108.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.290	4.291	0/0	131688	15	64:1	Target = 1.13		2000.00	1926.52		
512 > 219	57	4.290	4.291		100146	14	92:1	1.31 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.427	4.428	0	124007	16	>100:1			1000.00	944.57	98.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.441	4.442	0/0	183303	16	>100:1			2000.00	2018.99		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.448	4.449	0	53620	16	>100:1			1000.00	913.63	87.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.455	4.456	0/0	125068	16	>100:1	Target = 1.10		2000.00	2134.46		
526 > 219	59	4.455	4.456		114258	17	>100:1	1.09 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.495	4.488	1	749290	18	>100:1			1000.00	1059.53	108.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.495	4.496	0/-1	1401182	17	>100:1	Target = 7.70		2000.00	1905.58		
613 > 169	38	4.495	4.496		183827	17	>100:1	7.62 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.730	4.737	0/-1	576878	19	>100:1	Target = 3.41		2000.00	1855.77		
663 > 169	38	4.730	4.737		176234	21	>100:1	3.27 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.952	4.948	1	816826	17	>100:1			1000.00	951.98	103.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.952	4.956	0/-1	1423769	17	>100:1	Target = 9.31		2000.00	2077.68		
713 > 169	42	4.952	4.956		154091	16	>100:1	9.23 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.343	5.338	1	395692	16	>100:1			1000.00	1037.27	104.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.343	5.347	0/-1	1319277	18	>100:1	Target = 13.26		2000.00	1924.89		
813 > 269	40	5.343	5.347		103511	16	>100:1	12.74 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.725	5.722	1/0	774557	23	>100:1	Target = 99.70		2000.00	1892.88		
913 > 319	40	5.725	5.722		7341	21	>100:1	105.51 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.915	3.916	0	746942	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.441	1	855542	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.209	3.198	1	930606	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.715	1.714	1	1034632	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.571	3.573	0	253380	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A017.d
Injection Date: 04-Aug-2021 15:41:27 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 7 Auto Sampler: 7
Sample Info: ICAL 5000_SVLC-1602 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.714	1.708	1	1045265	21	>100:1			1000.00	1002.98	99	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.714	1.714	1/0	5574959	21	>100:1			5000.00	5129.89		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.078	2.068	1	1070987	15	>100:1			1000.00	1055.49	102.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.078	2.068	1/0	5570610	16	>100:1			5000.00	4847.03		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.120	1	311270	16	>100:1			1000.00	1003.86	99	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.120	1/0	1772793	16	>100:1	Target = 3.62		4420.00	4386.94		
298.9 > 99	44	2.131	2.120		498373	16	>100:1	3.55 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.485	2.476	1/0	1306704	18	>100:1	Target = 3.24		4690.00	4450.07		
349 > 99	44	2.476	2.476		401354	18	>100:1	3.25 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.398	1	295548	17	>100:1			5000.00	5131.31	105.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	1/0	505476	17	>100:1	Target = 1.40		4670.00	4494.51		
327 > 81	63	2.407	2.398		309965	17	>100:1	1.63 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.441	1	957978	17	>100:1			1000.00	1077.67	109.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	1/0	4431711	19	>100:1	Target = 16.70		5000.00	4623.83		
313 > 119	49	2.450	2.441		272163	17	>100:1	16.28 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	622785	19	>100:1			5000.00	4919.51	101.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	1/0	1084877	18	>100:1	Target = 0.81		10000	10007		
285 > 185	66	2.563	2.563		1314371	18	>100:1	0.82 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.828	2.819	1	952350	18	>100:1			1000.00	1042.17	102.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.828	2.819	1/0	4213434	18	>100:1	Target = 3.14		5000.00	4947.70		
363 > 169	47	2.828	2.819		1370226	18	>100:1	3.07 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.846	2.837	1	266501	19	>100:1			1000.00	1075.41	104.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.846	2.837	1/0	1283799	27	>100:1	Target = 3.29	0.19	4550.00	4122.98		
399 > 99	45	2.837	2.837		388332	25	>100:1	3.30 (1.64-4.94)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.863	1/0	7312878	19	>100:1	Target = 2.66		4710.00	4633.84		
377 > 85	45	2.863	2.863		2598523	19	>100:1	2.81 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.210	3.210	1/0	1209995	21	>100:1	Target = 3.57		4760.00	4486.83		
449 > 99	45	3.210	3.210		331386	20	>100:1	3.65 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.179	3.179	1	261807	28	>100:1			5000.00	5217.62	104.5	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.179	3.179	1/0	449297	22	>100:1	Target = 1.53		4740.00	4475.95		
427 > 81	64	3.179	3.179		293295	24	>100:1	1.53 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.204	3.204	1	914444	21	>100:1			1000.00	1007.74	99.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.204	3.204	1/0	4508876	23	>100:1	Target = 2.76		5000.00	4919.77		
413 > 169	53	3.204	3.204		1648049	23	>100:1	2.73 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.573	3.573	1	215889	19	>100:1			1000.00	969.58	98.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.573	3.573	1/0	1139817	43	>100:1	Target = 3.99	0.28	4640.00	4673.25		M
499 > 99	54	3.573	3.573		255281	33	>100:1	4.46 (1.99-5.98)	0.08				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.775	1/0	3554998	19	>100:1			4660.00	5435.28		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.908	1/0	980244	19	>100:1	Target = 3.23		4800.00	5140.21		
549 > 99	54	3.908	3.908		291309	18	>100:1	3.36 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.200	4.208	0/-1	1014092	16	>100:1	Target = 3.16		4820.00	4920.90		
599 > 99	54	4.208	4.208		316999	17	>100:1	3.19 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.365	1/0	2687438	15	>100:1			4710.00	5086.25		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.706	4.706	1/0	792572	17	>100:1	Target = 3.30		4840.00	5109.13		
699 > 99	54	4.706	4.706		226537	17	>100:1	3.49 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.573	3.573	1	833128	19	>100:1			1000.00	961.75	92.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.580	3.580	1/0	4173216	19	>100:1	Target = 5.07		5000.00	5541.77		
463 > 169	56	3.580	3.580		705813	20	>100:1	5.91 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.856	3.848	1	391918	19	>100:1			1000.00	915.65	91.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.856	1/0	2281480	18	>100:1	Target = 39.40		5000.00	5325.58		
498>478	55	3.848	3.856		59569	19	>100:1	38.29 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	1	228242	19	>100:1			5000.00	5060.28	95.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.916	3.916	1/0	381231	19	>100:1	Target = 1.43		4790.00	4709.74		
527 > 81	65	3.916	3.916		239801	17	>100:1	1.58 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.505	4.505	1/0	401368	17	>100:1	Target = 2.34		4820.00	4522.35		
627 > 80	65	4.505	4.505		172110	17	>100:1	2.33 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.916	1	755954	17	>100:1			1000.00	986.16	93.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.923	3.923	1/0	3562291	18	>100:1	Target = 10.17		5000.00	4964.50		
513 > 169	51	3.923	3.923		345801	17	>100:1	10.30 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.069	1	967314	16	>100:1			5000.00	4774.15	83.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	1/0	824741	32	>100:1	Target = 1.51	0.08	5000.00	5166.37		M
570 > 483	58	4.077	4.077		544794	32	>100:1	1.51 (0.75-2.27)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.217	4.225	0	721628	16	>100:1			1000.00	1018.24	99.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.225	1/1	3161556	17	>100:1	Target = 9.80		5000.00	4770.29		
563 > 169	52	4.225	4.225		310127	15	>100:1	10.19 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.225	1	919765	18	>100:1			5000.00	5105.58	96	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.235	1/0	976861	36	>100:1	Target = 1.83	0.06	5000.00	5051.07		M
584 > 526	60	4.235	4.235		523885	32	>100:1	1.86 (0.91-2.75)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.263	4.272	0	131657	15	>100:1			1000.00	969.68	101.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.282	1/1	662583	15	>100:1			5000.00	4996.46		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.282	4.282	1	60247	13	>100:1			1000.00	1001.34	103.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.291	4.291	1/0	327433	14	72:1	Target = 1.13		5000.00	4994.80		
512 > 219	57	4.291	4.291		277306	14	>100:1	1.18 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.429	4.428	1	132043	17	>100:1			1000.00	1005.78	105.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.442	4.442	1/0	498327	17	>100:1			5000.00	5154.78		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.449	4.449	1	61716	17	>100:1			1000.00	1051.58	100.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.456	4.456	1/0	314153	16	>100:1	Target = 1.10		5000.00	4658.13		
526 > 219	59	4.456	4.456		281277	16	>100:1	1.11 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.488	4.488	1	736381	18	>100:1			1000.00	1041.28	106.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.488	4.496	0/-1	3419779	17	>100:1	Target = 7.70		5000.00	4732.35		
613 > 169	38	4.488	4.496		430906	19	>100:1	7.93 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.731	4.737	0/-1	1443033	19	>100:1	Target = 3.41		5000.00	4723.50		
663 > 169	38	4.731	4.737		434663	19	>100:1	3.31 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.956	4.948	1	826364	17	>100:1			1000.00	963.10	104.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.956	4.956	1/0	3489849	16	>100:1	Target = 9.31		5000.00	5033.90		
713 > 169	42	4.956	4.956		393819	18	>100:1	8.86 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.347	5.338	1	372724	17	>100:1			1000.00	977.06	98.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.347	1/0	3243651	17	>100:1	Target = 13.26		5000.00	5024.29		
813 > 269	40	5.347	5.347		239505	16	>100:1	13.54 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.722	5.722	1/0	1955839	23	>100:1	Target = 99.70		5000.00	5074.27		
913 > 319	40	5.722	5.722		19742	22	>100:1	99.06 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.916	3.916	1	731398	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	1	830784	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.204	3.198	1	953869	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.714	1.714	1	1023793	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.573	3.573	1	230899	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A018.d		
Injection Date:	04-Aug-2021 15:52:03	Injection Vol:	10.0 uL
Sample Type:	Ical, Level: 8	Auto Sampler:	8
Sample Info:	ICAL 10000_SVLC-1603	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.709	1.708	1	1049255	20	>100:1			1000.00	1006.81	99.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.714	1/0	10414022	20	>100:1			10000	9546.19		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	989337	15	>100:1			1000.00	975.02	94.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	1/0	10677050	16	>100:1			10000	10057		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.120	1	313835	16	>100:1			1000.00	1012.13	99.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.120	1/0	3713110	16	>100:1	Target = 3.62		8840.00	9113.34		
298.9 > 99	44	2.131	2.120		952754	16	>100:1	3.89 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.476	1/0	2912160	18	>100:1	Target = 3.24		9380.00	9836.50		
349 > 99	44	2.477	2.476		851352	18	>100:1	3.42 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.398	1	277199	18	>100:1			5000.00	4812.73	99.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.398	1/0	999688	17	>100:1	Target = 1.40		9340.00	9477.25		
327 > 81	63	2.407	2.398		605348	19	>100:1	1.65 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.441	1	860302	17	>100:1			1000.00	967.79	98.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.441	1/0	8342341	18	>100:1	Target = 16.70		10000	9692.22		
313 > 119	49	2.442	2.441		566216	17	>100:1	14.73 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.564	2.563	1	605204	19	>100:1			5000.00	4780.64	98.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.564	2.563	1/0	2174440	19	>100:1	Target = 0.81		20000	20640		
285 > 185	66	2.564	2.563		2562857	19	>100:1	0.84 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.821	2.819	1	900182	18	>100:1			1000.00	985.09	96.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.821	2.819	1/0	8415577	19	>100:1	Target = 3.14		10000	10455		
363 > 169	47	2.821	2.819		2613858	19	>100:1	3.21 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.839	2.837	1	253867	18	>100:1			1000.00	1024.43	99.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.839	2.837	1/0	2605465	26	>100:1	Target = 3.29	0.17	9100.00	8783.99		
399 > 99	45	2.839	2.837		748448	24	>100:1	3.48 (1.64-4.94)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.865	2.863	1/0	13538147	18	>100:1	Target = 2.66		9420.00	9005.43		
377 > 85	45	2.865	2.863		5210515	18	>100:1	2.59 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.210	3.210	1/0	2393112	24	>100:1	Target = 3.57		9520.00	9315.62		
449 > 99	45	3.210	3.210		661616	23	>100:1	3.61 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.179	3.179	1	224920	22	>100:1			5000.00	4482.49	89.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.179	3.179	1/0	831157	22	>100:1	Target = 1.53		9480.00	9638.01		
427 > 81	64	3.179	3.179		586543	22	>100:1	1.41 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.198	3.204	0	877125	22	>100:1			1000.00	966.61	95.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.204	3.204	1/1	8507241	22	>100:1	Target = 2.76		10000	9677.45		
413 > 169	53	3.204	3.204		3215364	22	>100:1	2.64 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.565	3.573	0	216745	20	>100:1			1000.00	973.43	98.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.565	3.573	0/0	2368490	44	>100:1	Target = 3.99	0.27	9280.00	9672.45		M
499 > 99	54	3.565	3.573		543254	34	>100:1	4.35 (1.99-5.98)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.775	1/1	6185108	20	>100:1			9320.00	9419.15		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.901	3.908	0/0	1866782	17	>100:1	Target = 3.23		9600.00	9750.39		
549 > 99	54	3.901	3.908		568479	19	>100:1	3.28 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.200	4.208	0/0	2085114	17	>100:1	Target = 3.16		9640.00	10078		
599 > 99	54	4.200	4.208		663426	16	>100:1	3.14 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.365	1/1	5482471	16	>100:1			9420.00	10335		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.706	4.706	1/1	1544127	17	>100:1	Target = 3.30		9680.00	9914.55		
699 > 99	54	4.706	4.706		469454	18	>100:1	3.28 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.573	3.573	1	822329	21	>100:1			1000.00	949.29	90.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.573	3.580	0/-1	7583136	20	>100:1	Target = 5.07		10000	10202		
463 > 169	56	3.580	3.580		1538282	20	>100:1	4.92 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	1	410838	18	>100:1			1000.00	959.85	96	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.848	3.856	0/-1	4757951	18	>100:1	Target = 39.40		10000	10595		
498>478	55	3.848	3.856		114007	18	>100:1	41.73 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	1	215032	19	>100:1			5000.00	4767.41	89.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.916	0/-1	681601	19	>100:1	Target = 1.43		9580.00	8937.83		
527 > 81	65	3.908	3.916		466428	19	>100:1	1.46 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.505	4.505	1/0	765173	18	>100:1	Target = 2.34		9640.00	9151.11		
627 > 80	65	4.505	4.505		347341	19	>100:1	2.20 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.916	1	684467	20	>100:1			1000.00	892.90	84.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.916	3.923	0/-1	6144383	18	>100:1	Target = 10.17		10000	9457.30		
513 > 169	51	3.916	3.923		627457	18	>100:1	9.79 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.069	1	999410	17	>100:1			5000.00	4932.56	86.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	1/0	1433336	36	>100:1	Target = 1.51	0.13	10000	8690.40		M
570 > 483	58	4.077	4.077		1028903	31	>100:1	1.39 (0.75-2.27)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.225	1	705316	16				1000.00	995.22	97	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.225	1/0	6458410	17	>100:1	Target = 9.80		10000	9970.09		
563 > 169	52	4.225	4.225		620725	18	>100:1	10.40 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.225	1	871299	22	>100:1			5000.00	4836.55	91	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.235	1/0	1789073	38	>100:1	Target = 1.83	0.07	10000	9765.36		M
584 > 526	60	4.235	4.235		1082651	35	>100:1	1.65 (0.91-2.75)	0.09				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.263	4.272	0	126262	14	>100:1			1000.00	929.95	97.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.273	4.282	0/0	1329555	14	>100:1			10000	10454		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.282	4.282	1	61594	15	>100:1			1000.00	1023.73	106.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.291	4.291	1/0	644700	15	84:1	Target = 1.13		10000	9619.46		
512 > 219	57	4.291	4.291		613522	14	91:1	1.05 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.429	4.428	1	134007	16	>100:1			1000.00	1020.74	106.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.442	4.442	1/0	957186	16	>100:1			10000	9756.19		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.449	4.449	1	56606	17	>100:1			1000.00	964.51	92	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.456	4.456	1/0	671870	16	>100:1	Target = 1.10		10000	10862		
526 > 219	59	4.456	4.456		569735	16	>100:1	1.17 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.497	4.488	1	689878	17	>100:1			1000.00	975.52	99.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.497	4.496	1/0	6759947	17	>100:1	Target = 7.70		10000	9985.10		
613 > 169	38	4.488	4.496		919067	17	>100:1	7.35 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.731	4.737	0/-1	3198673	18	>100:1	Target = 3.41		10000	11176		
663 > 169	38	4.731	4.737		833458	19	>100:1	3.83 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.948	4.948	1	901166	16	>100:1			1000.00	1050.28	114.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.948	4.956	0/-1	7246991	17	>100:1	Target = 9.31		10000	9585.67		
713 > 169	42	4.948	4.956		792401	16	>100:1	9.14 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.338	5.338	1	385384	17	>100:1			1000.00	1010.25	101.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.347	1/0	6055120	17	>100:1	Target = 13.26		10000	9071.04		
813 > 269	40	5.347	5.347		450133	16	>100:1	13.45 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.722	5.722	1/0	3934770	23	>100:1	Target = 99.70		10000	9873.10		
913 > 319	40	5.722	5.722		40566	23	>100:1	96.99 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.916	3.916	1	779788	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.441	1	799064	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.204	3.198	1	901253	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.715	1.714	1	1017113	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.565	3.573	0	228368	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A019.d
Injection Date: 04-Aug-2021 16:02:39 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 9 Auto Sampler: 9
Sample Info: ICAL 15000_SVLC-1604 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	1	1023013	21	>100:1			1000.00	981.63	96.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.714	1/0	14598133	20	>100:1			15000	13725		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	953777	16	>100:1			1000.00	939.97	90.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	1/0	14567380	15	>100:1			15000	14233		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	1	296214	15	>100:1			1000.00	955.31	94.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.120	1/0	4954986	16	>100:1	Target = 3.62		13260	12885		
298.9 > 99	44	2.120	2.120		1379586	16	>100:1	3.59 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	1/0	4068268	19	>100:1	Target = 3.24		14070	14559		
349 > 99	44	2.476	2.476		1179475	19	>100:1	3.44 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	1	264840	19	>100:1			5000.00	4598.15	94.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	1/0	1429723	18	>100:1	Target = 1.40		14010	14187		
327 > 81	63	2.398	2.398		830047	18	>100:1	1.72 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	1	860022	18	>100:1			1000.00	967.48	98.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	1/0	12297180	18	>100:1	Target = 16.70		15000	14292		
313 > 119	49	2.441	2.441		740601	18	>100:1	16.60 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.554	2.563	0	557938	19	>100:1			5000.00	4407.27	91.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	1/1	3073796	19	>100:1	Target = 0.81		30000	31649		
285 > 185	66	2.563	2.563		3505509	18	>100:1	0.87 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.820	2.819	1	816930	17	>100:1			1000.00	893.98	87.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.820	2.819	1/0	11038855	19	>100:1	Target = 3.14		15000	15111		
363 > 169	47	2.820	2.819		3575879	18	>100:1	3.08 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.837	2.837	1	231072	18	>100:1			1000.00	932.45	90.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.837	2.837	1/0	3672863	26	>100:1	Target = 3.29	0.21	13650	13604		
399 > 99	45	2.837	2.837		1093830	24	>100:1	3.35 (1.64-4.94)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.863	1/0	18970512	18	>100:1	Target = 2.66		14130	13864		
377 > 85	45	2.864	2.863		7724860	18	>100:1	2.45 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.204	3.210	0/-1	3308677	23	>100:1	Target = 3.57		14280	14150		
449 > 99	45	3.204	3.210		945809	23	>100:1	3.49 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.172	3.179	0	227310	22	>100:1			5000.00	4530.12	90.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.172	3.179	0/0	1262339	23	>100:1	Target = 1.53		14220	14484		
427 > 81	64	3.179	3.179		759377	22	>100:1	1.66 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.204	3.204	1	836118	23	>100:1			1000.00	921.42	90.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.198	3.204	0/-1	12088647	23	>100:1	Target = 2.76		15000	14426		
413 > 169	53	3.204	3.204		4367428	22	>100:1	2.76 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.565	3.573	0	214149	19	>100:1			1000.00	961.77	97.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.573	3.573	1/1	3415001	42	>100:1	Target = 3.99		13920	14115		M
499 > 99	54	3.565	3.573		823426	43	>100:1	4.14 (1.99-5.98)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.775	1/1	8865615	20	>100:1			13980	13665		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.908	1/1	2722769	19	>100:1	Target = 3.23		14400	14394		
549 > 99	54	3.908	3.908		889372	18	>100:1	3.06 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.200	4.208	0/0	2932890	16	>100:1	Target = 3.16		14460	14348		
599 > 99	54	4.200	4.208		875933	17	>100:1	3.34 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.356	4.365	0/0	7532086	15	>100:1			14130	14371		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.706	4.706	1/1	2282251	17	>100:1	Target = 3.30		14520	14832		
699 > 99	54	4.706	4.706		662378	18	>100:1	3.44 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.580	3.573	1	800131	22	>100:1			1000.00	923.66	88.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.573	3.580	0/-1	10603362	20	>100:1	Target = 5.07		15000	14661		
463 > 169	56	3.573	3.580		2084036	20	>100:1	5.08 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	1	411043	19	>100:1			1000.00	960.33	96	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.848	3.856	0/-1	6701702	18	>100:1	Target = 39.40		15000	14916		
498>478	55	3.856	3.856		182877	18	>100:1	36.64 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.908	1	196240	19	>100:1			5000.00	4350.77	82	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.916	0/-1	916309	20	>100:1	Target = 1.43		14370	13166		
527 > 81	65	3.908	3.916		634206	19	>100:1	1.44 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.505	4.505	1/0	1061800	17	>100:1	Target = 2.34		14460	13915		
627 > 80	65	4.505	4.505		470548	17	>100:1	2.25 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.916	1	661374	19	>100:1			1000.00	862.77	81.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.916	3.923	0/-1	9471354	18	>100:1	Target = 10.17		15000	15087		
513 > 169	51	3.908	3.923		1068867	19	>100:1	8.86 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.069	1	970067	17	>100:1			5000.00	4787.74	83.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	1/0	2317561	38	>100:1	Target = 1.51	0.11	15000	14477		M
570 > 483	58	4.077	4.077		1578175	31	>100:1	1.46 (0.75-2.27)	0.22				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.225	1	625625	16	>100:1			1000.00	882.78	86.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.225	1/0	8142237	17	>100:1	Target = 9.80		15000	14171		
563 > 169	52	4.225	4.225		825787	17	>100:1	9.85 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.225	1	769444	17	>100:1			5000.00	4271.15	80.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.235	1/0	2494953	40	>100:1	Target = 1.83		15000	15421		M
584 > 526	60	4.235	4.235		1334964	33	>100:1	1.86 (0.91-2.75)	0.27				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.263	4.272	0	134546	19	>100:1			1000.00	990.96	104.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.273	4.282	0/0	1893384	15	>100:1			15000	13971		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.282	4.282	1	54655	13	>100:1			1000.00	908.40	94.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.291	4.291	1/0	1096809	14	>100:1	Target = 1.13		15000	18443		
512 > 219	57	4.282	4.291		856923	16	>100:1	1.27 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.429	4.428	1	144569	17	>100:1			1000.00	1101.19	115.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.435	4.442	0/-1	1480830	18	>100:1			15000	13991		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.449	4.449	1	57322	15	>100:1			1000.00	976.71	93.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.456	4.456	1/0	877174	16	>100:1	Target = 1.10		15000	14003		
526 > 219	59	4.456	4.456		816945	16	>100:1	1.07 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.497	4.488	1	705767	16	>100:1			1000.00	997.99	102.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.488	4.496	0/-1	9187170	17	>100:1	Target = 7.70		15000	13265		
613 > 169	38	4.488	4.496		1141318	17	>100:1	8.04 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.731	4.737	0/-1	4163285	19	>100:1	Target = 3.41		15000	14219		
663 > 169	38	4.731	4.737		1211119	19	>100:1	3.43 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.948	4.948	1	787053	17	>100:1			1000.00	917.28	99.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.956	4.956	1/0	9536800	17	>100:1	Target = 9.31		15000	14443		
713 > 169	42	4.948	4.956		1079430	16	>100:1	8.83 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.338	5.338	1	363249	18	>100:1			1000.00	952.22	95.6	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.347	1/0	8878486	17	>100:1	Target = 13.26		15000	14111		
813 > 269	40	5.347	5.347		690138	17	>100:1	12.86 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.715	5.722	0/-1	5485514	23	>100:1	Target = 99.70		15000	14603		
913 > 319	40	5.715	5.722		54286	22	>100:1	101.04 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.916	3.916	1	648667	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	1	810887	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.198	3.198	1	907967	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.715	1.714	1	990993	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.565	3.573	0	218107	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A020.d
Injection Date: 04-Aug-2021 16:13:16 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 10 Auto Sampler: 10
Sample Info: ICAL 20000_SVLC-1605 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	0	957707	21	>100:1			1000.00	918.97	90.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.714	1.714	0/0	18420631	21	>100:1			20000	18500		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	0	942842	16	>100:1			1000.00	929.20	89.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	0/0	18416497	15	>100:1			20000	18202		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	0	290646	17	>100:1			1000.00	937.35	92.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.120	0/0	6424145	16	>100:1	Target = 3.62		17680	17025		
298.9 > 99	44	2.131	2.120		1716942	16	>100:1	3.74 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	0/0	5152050	19	>100:1	Target = 3.24		18760	18791		
349 > 99	44	2.476	2.476		1504143	19	>100:1	3.42 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	0	260202	18	>100:1			5000.00	4517.63	93.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.398	0/0	1787286	18	>100:1	Target = 1.40		18680	18051		
327 > 81	63	2.398	2.398		1157549	19	>100:1	1.54 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	0	780475	18	>100:1			1000.00	877.99	89.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	0/0	14253656	18	>100:1	Target = 16.70		20000	18254		
313 > 119	49	2.441	2.441		923392	18	>100:1	15.43 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	0	592440	19	>100:1			5000.00	4679.81	96.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	0/0	3812787	19	>100:1	Target = 0.81		40000	36972		
285 > 185	66	2.563	2.563		4663636	20	>100:1	0.81 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.819	0	843258	18	>100:1			1000.00	922.79	90.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.819	0/0	14270539	19	>100:1	Target = 3.14		20000	18925		
363 > 169	47	2.818	2.819		4537340	19	>100:1	3.14 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.837	0	215785	18	>100:1			1000.00	870.76	84.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.837	0/0	4696967	26	>100:1	Target = 3.29	0.18	18200	18630		
399 > 99	45	2.836	2.837		1384764	26	>100:1	3.39 (1.64-4.94)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.863	0/0	23283034	19	>100:1	Target = 2.66		18840	18221		
377 > 85	45	2.862	2.863		9659596	18	>100:1	2.41 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.210	0/0	4146104	22	>100:1	Target = 3.57		19040	18988		
449 > 99	45	3.208	3.210		1197170	23	>100:1	3.46 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.170	3.179	0	225530	22	>100:1			5000.00	4494.65	90	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.170	3.179	0/0	1562674	22	>100:1	Target = 1.53		18960	18072		
427 > 81	64	3.176	3.179		998531	22	>100:1	1.56 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.202	3.204	0	798291	24	>100:1			1000.00	879.73	86.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.202	3.204	0/0	15104917	22	>100:1	Target = 2.76		20000	18880		
413 > 169	53	3.202	3.204		5701787	22	>100:1	2.64 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.569	3.573	0	194364	21	>100:1			1000.00	872.91	88.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.569	3.573	0/0	3928953	46	>100:1	Target = 3.99	0.31	18560	17893		M
499 > 99	54	3.569	3.573		1091299	41	>100:1	3.60 (1.99-5.98)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.773	3.775	0/0	10900185	20	>100:1			18640	18511		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.899	3.908	0/0	3258850	18	>100:1	Target = 3.23		19200	18981		
549 > 99	54	3.899	3.908		1009626	18	>100:1	3.22 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.205	4.208	0/0	3827379	17	>100:1	Target = 3.16		19280	20629		
599 > 99	54	4.196	4.208		1107816	17	>100:1	3.45 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.362	4.365	0/0	9629785	15	>100:1			18840	20244		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.704	4.706	0/0	2853347	17	>100:1	Target = 3.30		19360	20430		
699 > 99	54	4.704	4.706		861714	18	>100:1	3.31 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.576	3.573	1	802146	20	>100:1			1000.00	925.99	88.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.576	3.580	0/-1	13177860	21	>100:1	Target = 5.07		20000	18175		
463 > 169	56	3.576	3.580		2664012	20	>100:1	4.94 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.846	3.848	0	415172	25	>100:1			1000.00	969.98	97	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.846	3.856	0/0	8280827	19	>100:1	Target = 39.40		20000	18247		
498>478	55	3.846	3.856		206560	26	>100:1	40.08 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.906	3.908	0	181393	21	>100:1			5000.00	4021.61	75.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.906	3.916	0/0	1162620	20	>100:1	Target = 1.43		19160	18073		
527 > 81	65	3.906	3.916		736751	18	>100:1	1.57 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.502	4.505	0/0	1371296	18	>100:1	Target = 2.34		19280	19441		
627 > 80	65	4.502	4.505		611614	18	>100:1	2.24 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.914	3.916	0	659800	19	>100:1			1000.00	860.72	81.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.914	3.923	0/0	11560207	18	>100:1	Target = 10.17		20000	18458		
513 > 169	51	3.914	3.923		1139257	18	>100:1	10.14 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.066	4.069	0	929393	16	>100:1			5000.00	4586.99	80.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.074	4.077	0/0	3095186	33	>100:1	Target = 1.51	0.09	20000	20180		M
570 > 483	58	4.074	4.077		2107842	31	>100:1	1.46 (0.75-2.27)	0.17				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.222	4.225	0	606283	16	>100:1			1000.00	855.49	83.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.222	4.225	0/0	10537000	16	>100:1	Target = 9.80		20000	18923		
563 > 169	52	4.222	4.225		982393	16	>100:1	10.72 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.222	4.225	0	682126	16	>100:1			5000.00	3786.46	71.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.232	4.235	0/0	3076893	37	>100:1	Target = 1.83		20000	21452		M
584 > 526	60	4.232	4.235		1823736	33	>100:1	1.68 (0.91-2.75)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.269	4.272	0	133283	14	>100:1			1000.00	981.66	103.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.279	4.282	0/0	2498126	16	>100:1			20000	18608		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.288	4.282	1	56524	22	97:1			1000.00	939.46	97.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.288	4.291	0/-1	1168505	15	80:1	Target = 1.13		20000	18999		
512 > 219	57	4.288	4.291		1047511	15	>100:1	1.11 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.426	4.428	0	132706	17	>100:1			1000.00	1010.83	105.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.439	4.442	0/0	1881063	17	>100:1			20000	19361		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.446	4.449	0	59912	15	>100:1			1000.00	1020.84	97.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.453	4.456	0/0	1171169	15	>100:1	Target = 1.10		20000	17888		
526 > 219	59	4.453	4.456		1176583	16	>100:1	0.99 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.494	4.488	1	633260	17	>100:1			1000.00	895.46	91.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.494	4.496	0/-1	11505809	17	>100:1	Target = 7.70		20000	18515		
613 > 169	38	4.494	4.496		1530606	17	>100:1	7.51 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.730	4.737	0/-1	5375248	19	>100:1	Target = 3.41		20000	20460		
663 > 169	38	4.730	4.737		1481112	18	>100:1	3.62 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.951	4.948	1	837206	18	>100:1			1000.00	975.73	106.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.951	4.956	0/-1	13196463	19	>100:1	Target = 9.31		20000	18789		
713 > 169	42	4.951	4.956		1420173	19	>100:1	9.29 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.334	5.338	0	342928	17	>100:1			1000.00	898.95	90.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.343	5.347	0/0	11336119	17	>100:1	Target = 13.26		20000	19085		
813 > 269	40	5.343	5.347		875518	16	>100:1	12.94 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.718	5.722	0/0	7326803	22	>100:1	Target = 99.70		20000	20660		
913 > 319	40	5.718	5.722		66391	24	>100:1	110.35 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.914	3.916	0	694404	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	0	791574	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.202	3.198	1	813545	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.714	0	927303	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.569	3.573	0	211791	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A025.d		
Injection Date:	04-Aug-2021 17:10:50	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	100
Lab Sample ID:	ID BLK C	Lab Prep. Batch:	
Sample Info:	ID BLK C	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.714	1.708	1	1081295	20	>100:1			1001.00	1037.56	102.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.721	1.714	1/0	11668	21	2.0:1			10.389	10.389		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.078	2.068	1	1075282	15	>100:1			1001.00	1059.72	102.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.068		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.120	2	327325	14	>100:1			1001.00	1055.64	104.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.120		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.476		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.398	2	305003	17	>100:1			5005.00	5295.46	109.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.398		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.459	2.441	2	941447	19	>100:1			1001.00	1059.07	107.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.441		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.579	2.563	1	644641	19	>100:1			5005.00	5092.16	105.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.563		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.837	2.819	2	1012547	18	>100:1			1001.00	1108.05	108.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.819		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.855	2.837	2	293958	18	>100:1			1001.00	1186.21	115.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.837		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.863		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.210		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.198	3.179	2	260690	21	>100:1			5005.00	5195.36	104.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.179		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.223	3.204	2	971715	22	>100:1			1001.00	1070.85	105.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.204		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.588	3.573	1	236360	19	>100:1			1001.00	1061.52	107.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.573		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.797	3.775	2/1	1513	23	12:1			2.1150	2.1150		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.908		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.208		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.365		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.706		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.595	3.573	2	931829	20	>100:1			1001.00	1075.69	103.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.580		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.856	3.848	1	447998	20	>100:1			1001.00	1046.67	104.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.856		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.923	3.908	1	303305	17	>100:1			5005.00	6724.48	126.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.916		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.505		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.931	3.916	1	846056	18	>100:1			1001.00	1103.70	104.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.923		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.085	4.069	1	1106774	17	>100:1			5005.00	5462.45	95.6	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.077		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.244	4.225	2	877906	15	>100:1			1001.00	1238.75	120.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.225		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.244	4.225	2	913243	17	>100:1			5005.00	5069.38	95.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.235		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.273	4.272	1	134324	15	>100:1			1001.00	989.32	103.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.282		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.291	4.282	1	61549	20	>100:1			1001.00	1022.98	106.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.291		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.435	4.428	1	132475	18	>100:1			1001.00	1009.07	105.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.442		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.456	4.449	1	62198	21	>100:1			1001.00	1059.79	101.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.456		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.513	4.488	2	794429	16	>100:1			1001.00	1123.36	115	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.496		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.737		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.972	4.948	2	886069	17	>100:1			1001.00	1032.68	112.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.956		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.364	5.338	2	461491	17	>100:1			1001.00	1209.76	121.5	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.364	5.347	2/0	7804	16	27:1	Target = 12.75		9.7727	9.7727		
813 > 269	40	5.364	5.347		632	15	29:1	12.34 (6.37-19.12)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.722		ND								
*** 37 13C2_PFDA**													
515 > 470		3.931	3.916	1	865191	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.441	2	886349	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.223	3.198	2	938636	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.721	1.714	1	1076575	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.588	3.573	1	239081	25	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A026.d
Injection Date: 04-Aug-2021 17:21:32 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1590 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1055815	1110603			105.2	50 - 150
8 PFBA			500.00	512.00	102.4	70 - 130
21 PFPeA			500.00	458.22	91.6	70 - 130
D 50 13C5_PFPeA	1049419	1062773			101.3	50 - 150
D 44 13C3_PFBS	314416	330408			105.1	50 - 150
7 PFBS			442.50	428.46	96.8	70 - 130
1 4:2 FTS			467.50	418.53	89.5	70 - 130
D 63 13C2_4:2 FTS_2	278992	336383			120.6	50 - 150
D 49 13C5_PFHxA	872566	884415			101.4	50 - 150
15 PFHxA			500.00	492.79	98.6	70 - 130
22 PFPeS			470.00	465.26	99	70 - 130
28 GenX			2500.00	2182.01	87.3	70 - 130
D 66 13C3_GenX	611910	675680			110.4	50 - 150
D 47 13C4_PFHpA	933088	1012497			108.5	50 - 150
13 PFHpA			500.00	476.85	95.4	70 - 130
D 45 13C3_PFHxS	254408	265077			104.2	50 - 150
14 PFHxS			456.00	421.58	92.5	70 - 130
29 ADONA			2355.00	2301.60	97.7	70 - 130
D 64 13C2_6:2 FTS_2	250534	258062			103	50 - 150
2 6:2 FTS			475.00	466.13	98.1	70 - 130
20 PFOA			500.00	513.89	102.8	70 - 130
D 53 13C8_PFOA	919907	906116			98.5	50 - 150
12 PFHpS			475.00	443.59	93.4	70 - 130
18 PFOS			462.75	480.92	103.9	70 - 130
D 54 13C8_PFOS	219295	232440			106	50 - 150
D 56 13C9_PFNA	904226	923897			102.2	50 - 150
17 PFNA			500.00	498.02	99.6	70 - 130
30 9Cl-PF3ONS			2330.00	2150.99	92.3	70 - 130
D 55 13C8_PFOSA	428055	446140			104.2	50 - 150
19 PFOSA			500.00	514.12	102.8	70 - 130
16 PFNS			480.00	492.61	102.6	70 - 130
D 65 13C2_8:2 FTS_2	239459	258601			108	50 - 150
3 8:2 FTS			480.00	449.09	93.6	70 - 130
D 51 13C6_PFDA	809951	805018			99.4	50 - 150
10 PFDA			500.00	506.05	101.2	70 - 130
D 58 d3-MeFOSAA	1157951	1094947			94.6	50 - 150

Report Date: 05-Aug-2021 13:48:57 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A026.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	587.36	117.5	70 - 130
9 PFDS			482.50	458.64	95.1	70 - 130
25 PFUdA			500.00	446.26	89.3	70 - 130
D 60 d5-EtFOSAA	957645	973780			101.7	50 - 150
D 52 13C7_PFUdA	726972	838500			115.3	50 - 150
5 N-EtFOSAA			500.00	587.59	117.5	70 - 130
D 61 d7-MeFOSE	129289	146493			113.3	50 - 150
D 57 d3-MeFOSA	58022	62808			108.2	50 - 150
31 11Cl-PF3OUDS			2355.00	2297.51	97.6	70 - 130
D 62 d9-EtFOSE	125524	139583			111.2	50 - 150
D 59 d5-EtFOSA	61517	59126			96.1	50 - 150
D 38 13C2_PFDoA	690580	687401			99.5	50 - 150
11 PFDoA			500.00	513.67	102.7	70 - 130
4 10:2 FTS			2410.00	2180.56	90.5	70 - 130
24 PFTrDA			500.00	527.93	105.6	70 - 130
D 42 13C2_PFTeDA	788343	898725			114	50 - 150
23 PFTeDA			500.00	526.35	105.3	70 - 130
D 40 13C2_PFHxDA	379801	450558			118.6	50 - 150

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A026.d
Injection Date: 04-Aug-2021 17:21:32 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1590 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	1	1110603	20	>100:1			1000.00	1065.68	105.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.714	1/0	591199	20	>100:1			500.00	512.00		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	1062773	16	>100:1			1000.00	1047.39	101.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.068	1/0	522585	14	>100:1			500.00	458.22		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.120	1	330408	15	>100:1			1000.00	1065.58	105.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.120	1/0	183789	16	>100:1	Target = 3.62		442.50	428.46		
298.9 > 99	44	2.131	2.120		48809	20	>100:1	3.76 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.476	1/0	145017	19	>100:1	Target = 3.24		470.00	465.26		
349 > 99	44	2.476	2.476		46940	18	>100:1	3.08 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.398	1	336383	18	>100:1			5000.00	5840.28	120.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.398	1/0	53574	18	>100:1	Target = 1.40		467.50	418.53		
327 > 81	63	2.398	2.398		34106	22	>100:1	1.57 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	1	884415	18	>100:1			1000.00	994.92	101.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.441	1/0	436043	18	>100:1	Target = 16.70		500.00	492.79		
313 > 119	49	2.441	2.441		27136	18	>100:1	16.06 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	675680	19	>100:1			5000.00	5337.34	110.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.563	1/0	256642	18	>100:1	Target = 0.81		2500.00	2182.01		
285 > 185	66	2.563	2.563		326588	19	>100:1	0.78 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.820	2.819	1	1012497	18	>100:1			1000.00	1107.99	108.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.828	2.819	1/0	431733	19	>100:1	Target = 3.14		500.00	476.85		
363 > 169	47	2.828	2.819		137702	18	>100:1	3.13 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.837	2.837	1	265077	17	>100:1			1000.00	1069.67	104.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.837	2.837	1/0	130569	27	>100:1	Target = 3.29	0.16	456.00	421.58		
399 > 99	45	2.837	2.837		39782	25	>100:1	3.28 (1.64-4.94)	0.09				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.863	1/0	3612860	18	>100:1	Target = 2.66		2355.00	2301.60		
377 > 85	45	2.864	2.863		1405340	19	>100:1	2.57 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.210	3.210	1/0	118987	22	>100:1	Target = 3.57		475.00	443.59		
449 > 99	45	3.210	3.210		37415	22	>100:1	3.18 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.179	3.179	1	258062	23	>100:1			5000.00	5142.99	103	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.179	3.179	1/0	46121	21	>100:1	Target = 1.53		475.00	466.13		
427 > 81	64	3.179	3.179		32944	22	>100:1	1.39 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.204	3.204	1	906116	21	>100:1			1000.00	998.56	98.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.204	3.204	1/0	466684	22	>100:1	Target = 2.76		500.00	513.89		
413 > 169	53	3.204	3.204		187845	35	>100:1	2.48 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.573	3.573	1	232440	19	>100:1			1000.00	1043.91	106	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.573	3.573	1/0	126291	41	99:1	Target = 3.99		462.75	480.92		M
499 > 99	54	3.573	3.573		32979	37	>100:1	3.82 (1.99-5.98)	0.13				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.782	3.775	1/0	1514729	21	>100:1			2330.00	2150.99		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.908	1/0	101143	18	>100:1	Target = 3.23		480.00	492.61		
549 > 99	54	3.908	3.908		29848	23	>100:1	3.38 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.208	1/0	101762	17	>100:1	Target = 3.16		482.50	458.64		
599 > 99	54	4.208	4.208		36786	15	>100:1	2.76 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.365	1/0	1307006	15	>100:1			2355.00	2297.51		
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.580	3.573	1	923897	19	>100:1			1000.00	1066.53	102.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.580	3.580	1/0	415893	19	>100:1	Target = 5.07		500.00	498.02		
463 > 169	56	3.580	3.580		84103	21	>100:1	4.94 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.848	1	446140	18	>100:1			1000.00	1042.33	104.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.856	1/0	250719	18	>100:1	Target = 39.40		500.00	514.12		
498>478	55	3.848	3.856		5543	23	49:1	45.23 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.916	3.908	1	258601	19	>100:1			5000.00	5733.36	108	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.916	3.916	1/0	41187	20	>100:1	Target = 1.43		480.00	449.09		
527 > 81	65	3.916	3.916		30601	18	>100:1	1.34 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.505	4.505	1/0	219271	17	>100:1	Target = 2.34		2410.00	2180.56		
627 > 80	65	4.505	4.505		90203	15	>100:1	2.43 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.923	3.916	1	805018	17	>100:1			1000.00	1050.16	99.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.923	3.923	1/0	386688	17	>100:1	Target = 10.17		500.00	506.05		
513 > 169	51	3.923	3.923		38493	16	>100:1	10.04 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.069	1	1094947	17	>100:1			5000.00	5404.08	94.6	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.077	1/0	106136	19	>100:1	Target = 1.51		500.00	587.36		
570 > 483	58	4.077	4.077		61226	17	>100:1	1.73 (0.75-2.27)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.225	1	838500	16	>100:1			1000.00	1183.15	115.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.225	1/0	343667	16	>100:1	Target = 9.80		500.00	446.26		
563 > 169	52	4.235	4.225		37822	23	>100:1	9.08 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.225	1	973780	16	>100:1			5000.00	5405.42	101.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.235	1/0	120311	23	>100:1	Target = 1.83		500.00	587.59		
584 > 526	60	4.235	4.235		59773	15	>100:1	2.01 (0.91-2.75)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.273	4.272	1	146493	17	>100:1			1000.00	1078.95	113.3	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.291	4.282	1	62808	15	>100:1			1000.00	1043.91	108.2	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.429	4.428	1	139583	16	>100:1			1000.00	1063.21	111.2	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.449	4.449	1	59126	17	>100:1			1000.00	1007.44	96.1	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.497	4.488	1	687401	17	>100:1			1000.00	972.02	99.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.497	4.496	1/0	346508	16	>100:1	Target = 7.70		500.00	513.67		
613 > 169	38	4.497	4.496		49494	18	>100:1	7.00 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.738	4.737	1/0	150555	19	>100:1	Target = 3.41		500.00	527.93		
663 > 169	38	4.738	4.737		48378	20	>100:1	3.11 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.956	4.948	1	898725	17	>100:1			1000.00	1047.43	114	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.956	4.956	1/0	396854	17	57:1	Target = 9.31		500.00	526.35		
713 > 169	42	4.956	4.956		39370	19	>100:1	10.08 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.347	5.338	1	450558	18	>100:1			1000.00	1181.10	118.6	
*** 37 13C2_PFDA**													
515 > 470		3.923	3.916	1	775245	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	1	913037	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.204	3.198	1	947559	23	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.715	1.714	1	1074495	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.573	3.573	1	229706	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b\080421A027.d
Injection Date: 04-Aug-2021 17:32:04 Injection Vol: 10.0 uL
Sample Type: CheckStd Auto Sampler: 12
Sample Info: ISOMERS_SVLC-1562 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Surrogates Conc. Level: Smp Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.708	1	1284525	20	>100:1			100000	1232.57	121.7	
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.068	1	1286589	15	>100:1			100000	1267.97	122.6	
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.120	1	335501	15	>100:1			100000	1082.01	106.7	
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.398	1	357770	17	>100:1			500000	6211.60	128.2	
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.441	1	1179171	18	>100:1			100000	1326.50	135.1	
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.563	1	793782	19	>100:1			500000	6270.26	129.7	
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.820	2.819	1	1114360	19	>100:1			100000	1219.46	119.4	
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.837	2.837	1	327686	18	>100:1			100000	1322.32	128.8	
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.179	3.179	1	295685	22	>100:1			500000	5892.79	118	
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.198	3.204	0	1177697	21	>100:1			100000	1297.85	128	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.204	3.204	1/1	12717051	33	>100:1	Target = 2.92	0.14	0	1077423		
413 > 169	53	3.204	3.204		5097809	36	>100:1	2.49 (1.46-4.38)	0.22				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.573	3.573	1	271507	19	>100:1			100000	1219.37	123.8	
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.580	3.573	1	1062644	20	>100:1			100000	1226.70	117.5	
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.856	3.848	1	619402	18	>100:1			100000	1447.12	144.7	
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.916	3.908	1	333893	18	>100:1			500000	7402.63	139.4	
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.916	1	967035	18	>100:1			100000	1261.51	119.4	
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.077	4.069	1	1169162	16	>100:1			500000	5770.37	101	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.085	4.077	1/0	2429743	37	>100:1	Target = 1.60	0.11	0	1259277		M
570 > 483	58	4.077	4.077		1867614	33	>100:1	1.30 (0.80-2.41)	0.27				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.226	4.225	1	951228	17	>100:1			100000	1342.21	130.8	
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.226	4.225	1	1239945	16	>100:1			500000	6882.89	129.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.235	1/0	2865488	40	>100:1	Target = 1.75		0	1099066		M
584 > 526	60	4.235	4.235		1734979	33	>100:1	1.65 (0.87-2.63)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.273	4.272	1	164130	16	>100:1			100000	1208.85	126.9	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.282	4.282	1	79162	14	>100:1			100000	1315.72	136.4	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.429	4.428	1	146404	19	>100:1			100000	1115.17	116.6	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.449	4.449	1	71597	17	>100:1			100000	1219.94	116.4	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.497	4.488	1	901368	17	>100:1			100000	1274.58	130.5	
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.948	4.948	1	1047696	17	>100:1			100000	1221.05	132.9	
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.338	5.338	1	536975	17	>100:1			100000	1407.63	141.4	
*** 37 13C2_PFDA**													
515 > 470		3.923	3.916	1	969663	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.441	1	972394	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.204	3.198	1	1075942	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.708	1.714	0	1208219	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.573	3.573	1	257113	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.385	2.711	3.216	3.259	3.195	3.475	3.345	3.289	3.387	3.422	3.268	2.523-3.866	0.22377	1.597
1 4:2 FTS	0.522	1.262	1.976	1.843	1.831	1.961	1.853	1.902	1.849	1.875	1.687	0.384-3.277	0.48219	0.915
15 PFHxA	17.651	17.071	18.236	18.609	17.663	17.772	18.954	17.307	19.329	19.230	18.182	14.934-20.391	0.90966	8.831
22 PFPeS	4.651	3.393	2.479	3.153	3.018	3.067	2.819	2.977	3.002	2.970	3.152	1.316-4.719	0.56726	1.509
28 GenX	0.997	0.787	0.773	0.768	0.744	0.775	0.759	0.782	0.817	0.778	0.798	0.528-0.959	0.07198	0.372
13 PFHpA	3.408	3.519	4.020	3.461	3.312	3.880	3.835	3.775	3.628	3.741	3.657	2.576-4.047	0.24506	1.656
14 PFHxS	3.231	2.617	3.554	3.335	3.115	3.031	2.985	3.111	3.012	3.084	3.107	2.368-3.861	0.24887	1.557
29 ADONA	2.921	2.622	3.386	2.988	3.029	3.080	3.196	3.140	2.951	2.861	3.017	2.438-3.619	0.19676	1.514
2 6:2 FTS	1.357	1.903	1.287	1.619	1.859	1.923	1.857	1.885	1.900	1.898	1.748	1.095-2.622	0.25436	0.929
20 PFOA	3.365	2.607	2.979	3.061	2.922	2.919	2.952	2.847	2.789	2.815	2.925	2.356-3.487	0.18840	1.461
12 PFHpS	2.433	2.465	2.857	3.112	2.909	2.930	3.026	2.927	2.984	2.895	2.853	2.189-3.628	0.23973	1.454
18 PFOS	3.318	2.855	3.552	3.195	3.336	3.588	3.462	3.189	3.479	3.526	3.350	2.685-3.986	0.21688	1.668
17 PFNA	8.588	6.466	6.371	6.223	6.449	6.714	6.308	6.327	6.063	6.064	6.557	4.217-8.680	0.74392	3.224
19 PFOSA	59.934	39.783	21.362	31.375	30.764	26.376	31.760	28.842	31.933	31.524	33.365	-0.588-62.116	10.45078	15.382
16 PFNS	2.386	2.334	2.478	3.369	2.773	2.633	2.714	2.522	2.548	2.605	2.636	1.939-3.606	0.27784	1.386
3 8:2 FTS	6.221	2.579	2.059	2.413	1.841	1.914	1.772	1.845	1.947	1.888	2.447	-2.296-5.978	1.37918	0.920
10 PFDA	14.443	12.588	11.362	12.626	11.952	13.461	13.730	14.163	13.325	13.254	13.090	9.118-14.785	0.94460	5.976
6 N-MeFOSAA	1.713	1.110	1.399	1.648	1.209	1.345	1.289	1.313	1.229	1.351	1.360	0.647-1.770	0.18705	0.604
9 PFDS	2.412	2.721	2.874	2.028	2.842	2.691	2.748	2.907	2.678	2.637	2.653	2.033-3.650	0.26934	1.421
5 N-EtFOSAA	2.311	1.227	1.272	1.769	1.522	1.520	1.740	1.720	1.564	1.669	1.631	0.639-2.404	0.29422	0.761
25 PFUdA	18.788	13.560	15.786	14.905	13.054	14.403	13.520	13.975	13.121	13.749	14.486	7.430-18.677	1.87448	6.527
26 MeFOSA	1.347	0.935	1.267	1.077	1.256	0.958	1.049	1.050	0.969	1.061	1.096	0.806-1.705	0.14997	0.628
27 EtFOSA	0.850	1.287	1.000	1.023	1.026	1.061	1.015	1.009	1.012	0.990	1.027	0.702-1.349	0.10776	0.513
11 PFDoA	12.549	10.239	9.448	10.989	11.727	10.436	10.711	10.832	10.789	10.051	10.777	9.247-14.206	0.82652	5.863
4 10:2 FTS	4.537	4.967	3.002	4.893	3.388	3.337	3.238	3.503	3.028	3.384	3.727	0.982-5.793	0.80193	1.694
34 PFDOS	3.143	3.093	2.927	3.023	3.139	3.123	3.110	3.109	3.056	3.182	3.090	2.912-3.365	0.07550	1.569
24 PFTrDA	7.838	8.089	8.167	8.469	8.162	8.190	7.598	7.921	8.352	7.905	8.069	7.415-8.908	0.24888	4.081
23 PFTeDA	13.088	12.889	11.077	12.009	11.901	11.683	11.505	11.287	10.942	10.447	11.682	9.536-14.265	0.78821	5.950
35 PFHxDA	9.617	10.626	11.071	11.484	10.092	10.682	10.645	10.167	10.565	10.395	10.534	8.523-11.660	0.52299	5.046
36 PFODA	13.693	13.972	13.664	13.425	13.176	13.335	13.170	13.136	12.704	12.820	13.309	11.980-14.371	0.39860	6.588

Report Date: 24-Aug-2021 09:38:32 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	583	578	580	569	575	554	539	539	517	521	Avg:A Wt:C2	555		RSD=4.5	
	105	104.1	104.4	102.4	103.5	99.7	97.1	97	93	93.8	Org:N Dep:R				
8 PFBA	1.004053	1.019480	1.038355	0.976216	0.993377	0.975749	1.013451	0.999585	0.983627	0.990411	Avg:A Wt:C2	0.999430		RSD=2.0	
	100.5	102	103.9	97.7	99.4	97.6	101.4	100	98.4	99.1	Org:N Dep:R				
D 50 13C5_PFPeA	568	531	539	526	538	510	506	502	488	496	Avg:A Wt:C2	521		RSD=4.7	
	109.1	102	103.6	101.1	103.4	97.9	97.3	96.5	93.8	95.3	Org:N Dep:R				
21 PFPeA	1.118171	1.125688	1.129754	1.066718	1.008563	1.052344	1.119375	1.120591	1.074828	1.087357	Avg:A Wt:C2	1.090339		RSD=3.7	
	102.6	103.2	103.6	97.8	92.5	96.5	102.7	102.8	98.6	99.7	Org:N Dep:R				
D 44 13C3_PFBS	186	183	183	168	187	179	177	179	177	175	Avg:A Wt:C2	179		RSD=3.2	
	103.8	102	102.2	93.8	104.3	99.6	98.6	100	98.5	97.3	Org:N Dep:R				
7 PFBS	1.205215	1.132625	1.193934	1.256208	1.173938	1.198576	1.228894	1.161848	1.164879	1.206561	Avg:A Wt:C2	1.192268		RSD=3.0	
	101.1	95	100.1	105.4	98.5	100.5	103.1	97.4	97.7	101.2	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	1.528166	2.153468	2.357496	2.309037	2.148042	2.243890	2.184305	2.165477	2.318891	2.127728	Avg:A Wt:C2	2.153650		RSD=10.9	
	71	100	109.5	107.2	99.7	104.2	101.4	100.5	107.7	98.8	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	21.9154	19.6486	21.4224	19.2772	20.6338	19.9576	19.5858	19.4678	17.8280	20.0674	Avg:A Wt:C2	19.9804		RSD=5.8	
	109.7	98.3	107.2	96.5	103.3	99.9	98	97.4	89.2	100.4	Org:N Dep:R				
D 49 13C5_PFHxA	579	640	621	566	593	570	599	572	567	541	Avg:A Wt:C2	585		RSD=5.0	
	99	109.4	106.3	96.8	101.4	97.4	102.4	97.9	96.9	92.5	Org:N Dep:R				
15 PFHxA	1.091188	0.966005	1.038296	1.067496	1.078899	1.066743	1.013346	1.015191	1.030783	1.081176	Avg:A Wt:C2	1.044912		RSD=3.8	
	104.4	92.4	99.4	102.2	103.3	102.1	97	97.2	98.6	103.5	Org:N Dep:R				
22 PFPeS	0.947309	0.971129	0.813326	0.948041	0.881083	0.899984	0.869926	0.868336	0.863477	0.910901	Avg:A Wt:C2	0.897351		RSD=5.4	
	105.6	108.2	90.6	105.6	98.2	100.3	96.9	96.8	96.2	101.5	Org:N Dep:R				
28 GenX	0.878227	0.707619	0.690457	0.670290	0.647908	0.677389	0.663699	0.679883	0.705786	0.661720	Avg:A Wt:C2	0.698298		RSD=9.5	
	125.8	101.3	98.9	96	92.8	97	95	97.4	101.1	94.8	Org:N Dep:R				
D 66 13C3_GenX	227	227	217	216	221	217	217	207	198	206	Avg:A Wt:C2	215		RSD=4.3	
	105.4	105.3	100.9	100.4	102.8	100.7	100.7	96.3	91.9	95.6	Org:N Dep:R				
13 PFHpA	1.164429	1.043231	1.177880	1.038497	1.126253	1.177351	1.111663	1.103567	1.111430	1.116440	Avg:A Wt:C2	1.117074		RSD=4.4	
	104.2	93.4	105.4	93	100.8	105.4	99.5	98.8	99.5	99.9	Org:N Dep:R				
D 47 13C4_PFHpA	502	515	495	527	479	468	476	488	446	441	Avg:A Wt:C2	484		RSD=5.7	
	103.7	106.5	102.2	108.9	99	96.8	98.5	100.8	92.3	91.2	Org:N Dep:R				
D 45 13C3_PFHxS	141	149	138	136	140	136	127	120	133	123	Avg:A Wt:C2	134		RSD=6.6	
	105.3	110.7	102.9	101.3	103.9	101.6	94.4	89.5	99	91.3	Org:N Dep:R				
14 PFHxS	1.152434	1.094080	1.041669	1.169224	0.993804	1.023542	1.173895	1.168265	1.030747	1.105811	Avg:A Wt:C2	1.095347		RSD=6.3	
	105.2	99.9	95.1	106.7	90.7	93.4	107.2	106.7	94.1	101	Org:N Dep:R				
29 ADONA	6.355175	6.061988	6.743659	6.859141	6.525829	6.678302	7.213248	6.949509	5.992249	6.506007	Avg:A Wt:C2	6.588511		RSD=5.8	
	96.5	92	102.4	104.1	99	101.4	109.5	105.5	90.9	98.7	Org:N Dep:R				
2 6:2 FTS	2.651454	2.479325	2.205313	2.203108	2.297675	2.565345	2.432903	2.331638	2.494044	2.648860	Avg:A Wt:C2	2.430967		RSD=6.9	
	109.1	102	90.7	90.6	94.5	105.5	100.1	95.9	102.6	109	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	16.7172	18.5160	17.3440	17.1842	17.3988	15.9728	15.2556	15.7106	13.7414	13.5124	Avg:A Wt:C2	16.1353		RSD=10.1	
	103.6	114.8	107.5	106.5	107.8	99	94.5	97.4	85.2	83.7	Org:N Dep:R				
D 53 13C8_PFOA	514	503	505	477	487	448	445	435	421	425	Avg:A Wt:C2	466		RSD=7.6	
	110.3	108	108.3	102.3	104.5	96.1	95.5	93.3	90.4	91.2	Org:N Dep:R				
20 PFOA	1.116683	0.962854	0.977141	0.989201	0.983422	1.005103	1.032107	1.002842	0.936265	0.947620	Avg:A Wt:C2	0.995324		RSD=5.1	
	112.2	96.7	98.2	99.4	98.8	101	103.7	100.8	94.1	95.2	Org:N Dep:R				
12 PFHpS	0.967700	0.869401	1.004112	1.018131	0.968107	0.909187	0.996441	1.013303	0.865096	0.903733	Avg:A Wt:C2	0.951521		RSD=6.3	
	101.7	91.4	105.5	107	101.7	95.6	104.7	106.5	90.9	95	Org:N Dep:R				
D 54 13C8_PFOS	132	144	131	135	131	141	128	134	131	125	Avg:A Wt:C2	133		RSD=4.3	
	99.6	108.4	98.4	101.2	98.2	105.8	95.8	100.4	98.3	94	Org:N Dep:R				
18 PFOS	1.053986	1.248155	1.091214	1.087392	1.222981	1.082154	1.182121	1.130210	1.096348	1.140064	Avg:A Wt:C2	1.133462		RSD=5.7	
	93	110.1	96.3	95.9	107.9	95.5	104.3	99.7	96.7	100.6	Org:N Dep:R				
17 PFNA	1.236892	1.080477	1.074969	1.136775	1.095787	1.058805	1.154111	1.030137	1.074460	1.056308	Avg:A Wt:C2	1.099872		RSD=5.5	
	112.5	98.2	97.7	103.4	99.6	96.3	104.9	93.7	97.7	96	Org:N Dep:R				
D 56 13C9_PFNA	604	595	587	548	581	594	544	588	522	535	Avg:A Wt:C2	570		RSD=5.1	
	106.1	104.4	103.1	96.1	101.9	104.2	95.4	103.2	91.7	94	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.953224	3.686073	3.927216	3.767651	3.794270	3.586402	3.944701	3.883931	3.479161	3.902807	Avg:A Wt:C2	3.792544		RSD=4.3	
	104.2	97.2	103.6	99.3	100	94.6	104	102.4	91.7	102.9	Org:N Dep:R				
D 55 13C8_PFOSA	286	274	299	267	268	274	268	277	260	256	Avg:A Wt:C2	273		RSD=4.6	
	105	100.4	109.6	97.8	98.3	100.5	98.1	101.5	95.2	93.8	Org:N Dep:R				
19 PFOSA	1.272218	1.118180	1.056716	1.117246	1.197035	1.062007	1.098814	1.063340	1.075551	1.141871	Avg:A Wt:C2	1.120298		RSD=6.1	
	113.6	99.8	94.3	99.7	106.8	94.8	98.1	94.9	96	101.9	Org:N Dep:R				
16 PFNS	0.932193	0.679926	0.860624	0.851425	0.906502	0.741240	0.845303	0.789952	0.753499	0.823073	Avg:A Wt:C2	0.818374		RSD=9.5	
	113.9	83.1	105.2	104	110.8	90.6	103.3	96.5	92.1	100.6	Org:N Dep:R				
3 8:2 FTS	1.739227	2.613652	2.441764	2.442471	2.285084	2.291640	2.080875	2.132501	2.313332	2.055335	Avg:A Wt:C2	2.239588		RSD=11.1	
	77.7	116.7	109	109.1	102	102.3	92.9	95.2	103.3	91.8	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	21.8824	20.8836	19.6498	19.1428	19.4796	18.2004	18.4624	19.0376	16.4172	17.9062	Avg:A Wt:C2	19.1062		RSD=8.0	
	114.5	109.3	102.8	100.2	102	95.3	96.6	99.6	85.9	93.7	Org:N Dep:R				
10 PFDA	1.330662	1.237001	1.123763	1.063063	1.161375	1.166171	1.187292	1.165630	1.120399	1.065649	Avg:A Wt:C2	1.162101		RSD=6.8	
	114.5	106.4	96.7	91.5	99.9	100.4	102.2	100.3	96.4	91.7	Org:N Dep:R				
D 51 13C6_PFDA	575	578	571	604	543	544	542	517	493	491	Avg:A Wt:C2	546		RSD=6.8	
	105.4	106	104.7	110.6	99.5	99.6	99.4	94.7	90.3	89.9	Org:N Dep:R				
D 58 d3-MeFOSAA	133	134	121	135	119	113	125	117	123	130	Avg:A Wt:C2	125		RSD=6.1	
	106.1	107.4	97	107.9	95.3	90.7	99.5	93.8	98.1	104.1	Org:N Dep:R				
6 N-MeFOSAA	0.773117	0.776166	0.857448	0.849580	0.817421	0.909099	0.816861	0.860324	0.752251	0.776814	Avg:A Wt:C2	0.818908		RSD=6.1	
	94.4	94.8	104.7	103.7	99.8	111	99.8	105.1	91.9	94.9	Org:N Dep:R				
9 PFDS	0.757289	0.808987	0.951599	0.785042	0.857176	0.760160	0.889506	0.829502	0.793250	0.833182	Avg:A Wt:C2	0.826569		RSD=7.3	
	91.6	97.9	115.1	95	103.7	92	107.6	100.4	96	100.8	Org:N Dep:R				
D 60 d5-EtFOSAA	119	122	118	113	119	112	112	105	96.9860	96.6390	Avg:A Wt:C2	111		RSD=8.1	
	106.7	109.4	106	101.3	106.6	100.9	100.7	94.3	87.2	86.9	Org:N Dep:R				
D 52 13C7_PFUdA	612	637	604	612	632	576	634	583	511	525	Avg:A Wt:C2	593		RSD=7.5	
	103.3	107.6	101.9	103.2	106.6	97.2	107	98.3	86.2	88.6	Org:N Dep:R				
5 N-EtFOSAA	1.268099	0.944172	0.857714	1.106244	1.026992	1.045322	1.037782	1.055023	1.052635	1.096378	Avg:A Wt:C2	1.049036		RSD=10.1	
	120.9	90	81.8	105.5	97.9	99.6	98.9	100.6	100.3	104.5	Org:N Dep:R				
25 PFUdA	1.109129	0.923734	0.972122	0.956131	0.828666	0.990463	0.852849	0.953349	0.951635	0.928470	Avg:A Wt:C2	0.946655		RSD=8.1	
	117.2	97.6	102.7	101	87.5	104.6	90.1	100.7	100.5	98.1	Org:N Dep:R				
D 61 d7-MeFOSE	92.5590	94.3550	79.2300	82.8840	89.0850	80.5440	84.3840	80.8070	73.5870	76.0150	Avg:A Wt:C2	83.3450		RSD=8.2	
	111.1	113.2	95.1	99.4	106.9	96.6	101.2	97	88.3	91.2	Org:N Dep:R				
32 MeFOSE	1.008006	0.892587	1.401237	1.178177	0.958186	1.132064	1.159981	1.151054	1.164764	1.220194	Avg:A Wt:C2	1.126625		RSD=12.8	
	89.5	79.2	124.4	104.6	85	100.5	103	102.2	103.4	108.3	Org:N Dep:R				
D 57 d3-MeFOSA	53.3810	47.8490	48.2120	46.9290	50.5890	48.3420	49.4670	54.0320	50.4870	54.7650	Avg:A Wt:C2	50.4053		RSD=5.5	
	105.9	94.9	95.6	93.1	100.4	95.9	98.1	107.2	100.2	108.6	Org:N Dep:R				
26 MeFOSA	1.155842	0.958850	1.318863	1.081847	1.045306	1.096324	1.036926	0.969975	0.950398	0.974225	Avg:A Wt:C2	1.058856		RSD=10.7	
	109.2	90.6	124.6	102.2	98.7	103.5	97.9	91.6	89.8	92	Org:N Dep:R				
31 11Cl-PF3OUDS	3.140130	3.280394	3.744225	3.384047	3.180007	2.973551	3.614202	3.339559	3.126329	3.481807	Avg:A Wt:C2	3.326425		RSD=7.1	
	94.4	98.6	112.6	101.7	95.6	89.4	108.7	100.4	94	104.7	Org:N Dep:R				
D 62 d9-EtFOSE	95.5530	98.1780	95.6480	95.4970	90.5290	91.4170	96.5180	91.0680	88.3210	92.9310	Avg:A Wt:C2	93.5660		RSD=3.4	
	102.1	104.9	102.2	102.1	96.8	97.7	103.2	97.3	94.4	99.3	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	0.788463	1.028438	0.918995	0.921181	1.009411	1.005043	0.905800	1.031045	0.957527	0.986923	Avg:A Wt:C2	0.955283		RSD=7.8	
	82.5	107.7	96.2	96.4	105.7	105.2	94.8	107.9	100.2	103.3	Org:N Dep:R				
D 59 d5-EtFOSA	44.6190	44.7820	44.4530	45.1920	43.4420	42.9720	45.6340	46.6400	45.8460	38.6150	Avg:A Wt:C2	44.2195		RSD=5.1	
	100.9	101.3	100.5	102.2	98.2	97.2	103.2	105.5	103.7	87.3	Org:N Dep:R				
27 EtFOSA	1.154217	1.379795	1.087778	1.053417	1.120091	1.144734	1.080173	1.022796	1.012080	1.238848	Avg:A Wt:C2	1.129393		RSD=9.8	
	102.2	122.2	96.3	93.3	99.2	101.4	95.6	90.6	89.6	109.7	Org:N Dep:R				
D 38 13C2_PFDoA	598	607	604	596	596	596	604	571	524	536	Avg:A Wt:C2	583		RSD=5.1	
	102.6	104.1	103.5	102.2	102.1	102.2	103.6	97.9	89.9	91.9	Org:N Dep:R				
11 PFDoA	1.133242	0.994525	1.038141	1.035797	1.143065	1.034548	1.027268	1.038156	1.105773	1.032070	Avg:A Wt:C2	1.058259		RSD=4.7	
	107.1	94	98.1	97.9	108	97.8	97.1	98.1	104.5	97.5	Org:N Dep:R				
4 10:2 FTS	2.576959	2.531817	2.217775	3.249762	2.539895	2.700570	2.560469	2.379769	2.573520	2.481532	Avg:A Wt:C2	2.581207		RSD=10.4	
	99.8	98.1	85.9	125.9	98.4	104.6	99.2	92.2	99.7	96.1	Org:N Dep:R				
34 PFDOS	0.754003	0.690849	0.803456	0.713529	0.757448	0.676327	0.796981	0.741673	0.726735	0.824843	Avg:A Wt:C2	0.748584		RSD=6.5	
	100.7	92.3	107.3	95.3	101.2	90.3	106.5	99.1	97.1	110.2	Org:N Dep:R				
24 PFTrDA	1.061395	0.914742	0.965012	0.964646	0.935726	0.902761	0.889030	0.912387	0.955374	0.922175	Avg:A Wt:C2	0.942325		RSD=5.2	
	112.6	97.1	102.4	102.4	99.3	95.8	94.3	96.8	101.4	97.9	Org:N Dep:R				
D 42 13C2_PFTeDA	910	905	913	902	903	881	894	854	869	915	Avg:A Wt:C2	895		RSD=2.2	
	101.7	101.1	102	100.8	100.9	98.4	100	95.5	97.2	102.3	Org:N Dep:R				
23 PFTeDA	0.776447	0.845574	0.822542	0.807523	0.824770	0.816884	0.834380	0.838668	0.756248	0.716867	Avg:A Wt:C2	0.803990		RSD=5.2	
	96.6	105.2	102.3	100.4	102.6	101.6	103.8	104.3	94.1	89.2	Org:N Dep:R				
35 PFHxDA	0.829097	0.719539	0.700137	0.713023	0.682805	0.666796	0.669502	0.662127	0.644881	0.653555	Avg:A Wt:C2	0.694146		RSD=7.7	
	119.4	103.7	100.9	102.7	98.4	96.1	96.4	95.4	92.9	94.2	Org:N Dep:R				
D 40 13C2_PFHxDA	855	871	865	844	846	838	840	815	791	796	Avg:A Wt:C2	836		RSD=3.2	
	102.2	104.1	103.4	101	101.2	100.2	100.5	97.5	94.6	95.2	Org:N Dep:R				
36 PFODA	0.876692	0.849879	0.832612	0.842030	0.854820	0.849321	0.868999	0.899394	0.870938	0.895069	Avg:A Wt:C2	0.863976		RSD=2.6	
	101.5	98.4	96.4	97.5	98.9	98.3	100.6	104.1	100.8	103.6	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	680773	656265	644351	676478	599597	638773	653149	598439	573738	596061	3.31
* 39 13C2_PFHxA	604810	629952	629151	591024	618541	558455	596847	576353	566357	582971	0.91
* 41 13C2_PFOA	531307	523758	503548	507041	517799	470704	475387	469635	451035	449899	4.14
* 43 13C3_PFBA	531675	553692	543608	523676	536669	514302	509696	496075	467408	493921	1.84
* 48 13C4_PFOS	131459	137543	142111	135999	135966	141542	132480	133041	132929	130700	0.14

13C2_PFDA ((|596061 - 680773| / (596061 + 680773)) / 2) * 100 = 3.32
13C2_PFHxA ((|582971 - 604810| / (582971 + 604810)) / 2) * 100 = 0.92
13C2_PFOA ((|449899 - 531307| / (449899 + 531307)) / 2) * 100 = 4.15
13C3_PFBA ((|493921 - 531675| / (493921 + 531675)) / 2) * 100 = 1.84
13C4_PFOS ((|130700 - 131459| / (130700 + 131459)) / 2) * 100 = 0.14

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	583037	578040	579662	568958	574801	553883	539298	538949	516545	521110	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	29270	58930	120379	277713	570994	1080902	2732761	5387255	7621312	10322261	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	567820	531053	539405	526259	538043	509525	506458	502499	488249	496034	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	31746	59780	121879	280685	542650	1072391	2834581	5630957	7871752	10787319	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	186163	183013	183412	168263	187099	178632	176862	179385	176633	174515	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	9917	18324	38716	93427	194164	378536	960663	1842416	2728326	3722753	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	1564	3952	9434	20787	41397	83654	199789	393747	579190	797598	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	109577	98243	107112	96386	103169	99788	97929	97339	89140	100337	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	578782	639924	621499	566329	593317	569799	598753	572424	567003	541168	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	604810	629952	629151	591024	618541	558455	596847	576353	566357	582971	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	31578	61817	129060	302277	640129	1215658	3033720	5811197	8766855	11701956	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	8271	16671	27985	74815	154629	301597	721589	1461090	2145936	2982201	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	19924	32083	59984	144840	286949	587381	1439607	2820691	4189975	5449351	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1134331	1133484	1085948	1080428	1107213	1083907	1084533	1037197	989435	1029391	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	29210	53760	116494	273621	539535	1103128	2648376	5380903	7440515	9845240	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	501705	515322	494507	526956	479053	468479	476471	487592	446303	440921	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	141373	148622	138208	135982	139557	136474	126738	120218	132990	122588	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	7413	14797	26202	72342	126210	254230	676936	1278063	1871129	2467177	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	42317	84869	175594	439311	857903	1717105	4305847	7869996	11260326	15026001	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	2101	4352	7252	17945	37898	77690	175927	347266	487343	678625	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	83586	92580	86720	85921	86994	79864	76278	78553	68707	67562	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	513933	502911	504574	476730	486725	447692	444611	434718	421315	424838	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	28695	48423	98608	235791	478656	899953	2294431	4359533	5916935	8051702	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	531307	523758	503548	507041	517799	470704	475387	469635	451035	449899	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	6512	12301	26423	65901	128621	236249	601126	1159700	1642901	2109380	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	131459	137543	142111	135999	135966	141542	132480	133041	132929	130700	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	132461	144256	130949	134615	130612	140706	127507	133503	130718	124994	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	6478	16709	26521	67920	148235	282605	699381	1400226	1994908	2644821	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	37367	64290	126231	311244	636270	1257170	3137237	6053992	8417210	11311416	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	604208	595015	587138	547591	580651	593674	543663	587688	522260	535422	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	24402	49558	95859	236347	461878	940627	2343873	4832573	6357949	9093104	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	286429	273954	298997	266840	268160	274235	267652	277015	259856	255949	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	18220	30633	63191	149063	320997	582479	1470499	2945612	4192324	5845215	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	5927	9416	21638	55015	113664	200250	517354	1012425	1418340	1975281	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	1823	5229	9193	22396	42643	79914	184022	388926	545750	705150	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	109412	104418	98249	95714	97398	91002	92312	95188	82086	89531	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	38261	71551	128400	320807	630572	1268223	3220144	6027587	8284110	10462370	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	575067	578423	571295	603552	542953	543755	542435	517110	492926	490892	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	680773	656265	644351	676478	599597	638773	653149	598439	573738	596061	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	663677	671506	606917	675181	596376	567408	622577	586416	613690	650996	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	5131	10424	20816	57362	97498	206332	508559	1009015	1384946	2022812	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	4835	11250	24025	50937	107927	206217	546676	1067543	1499388	2007873	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	593250	608417	589241	563411	592804	561157	559787	524300	484930	483195	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	612192	637413	603947	611772	631526	575835	633919	582568	511026	525183	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7523	11489	20216	62327	121761	234636	580937	1106297	1531363	2119058	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	33950	58880	117422	292467	523324	1140686	2703185	5553906	7294654	9752333	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	92559	94355	79230	82884	89085	80544	84384	80807	73587	76015	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	4665	8422	22204	48826	85360	182362	489419	930132	1285672	1855061	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	53381	47849	48212	46929	50589	48342	49467	54032	50487	54765	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	3085	4588	12717	25385	52881	105997	256468	524097	719741	1067069	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	19591	44577	92373	214561	391257	788259	2170538	4199824	5774472	8199262	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	95553	98178	95648	95497	90529	91417	96518	91068	88321	92931	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	3767	10097	17580	43985	91381	183756	437130	938952	1268546	1834314	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	44619	44782	44453	45192	43442	42972	45634	46640	45846	38615	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2575	6179	9671	23803	48659	98383	246463	477032	695997	956762	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	598213	607275	603858	595993	595792	595946	604365	571044	524494	535827	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	33896	60395	125378	308664	681029	1233069	3104224	5928328	8699570	11060221	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	2718	5097	8402	29985	47695	94764	227853	436741	610935	856703	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	4834	9647	20369	46489	95766	184236	491844	958471	1379361	1996024	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	31747	55550	116546	287461	557498	1075994	2686493	5210130	7516321	9882522	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	909914	904534	912519	901768	902749	880637	894200	854370	869439	915148	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	35325	76485	150117	364099	744560	1438756	3730513	7165326	9862676	13120795	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	35432	62652	121064	300946	577451	1117260	2813373	5396284	7654353	10407257	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	854713	870724	864574	844141	845704	837783	840438	814992	791293	796204	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	37466	74001	143971	355396	722925	1423094	3651699	7329992	10337513	14253151	

Report Date: 24-Aug-2021 09:38:32 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	080521006.d	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58
2	080521007.d	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34
3	080521008.d	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09
4	080521009.d	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48
5	080521010.d	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22
6	080521011.d	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58
7	080521012.d	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33
8	080521013.d	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14
9	080521014.d	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51
10	080521015.d	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.705	1.704	1.704	1.705	1.710	1.704	1.704	1.699	1.704	1.704	1.704	0.169
8 PFBA	1.705	1.711	1.711	1.705	1.710	1.711	1.704	1.705	1.704	1.704	1.707	0.175
D 50 13C5_PFPeA	2.078	2.076	2.076	2.078	2.066	2.076	2.076	2.067	2.076	2.066	2.073	0.256
21 PFPeA	2.078	2.076	2.076	2.078	2.066	2.076	2.076	2.067	2.066	2.076	2.073	0.256
D 44 13C3_PFBS	2.131	2.129	2.129	2.131	2.119	2.129	2.129	2.120	2.129	2.129	2.127	0.214
7 PFBS	2.131	2.129	2.129	2.131	2.119	2.129	2.129	2.130	2.129	2.129	2.128	0.170
1 4:2 FTS	2.398	2.397	2.397	2.398	2.388	2.397	2.397	2.389	2.397	2.397	2.395	0.155
D 63 13C2_4:2 FTS_2	2.398	2.397	2.397	2.398	2.388	2.397	2.397	2.389	2.388	2.388	2.393	0.202
D 49 13C5_PFHxA	2.434	2.433	2.433	2.434	2.423	2.433	2.433	2.434	2.432	2.433	2.431	0.123
* 39 13C2_PFHxA	2.434	2.433	2.433	2.434	2.423	2.433	2.433	2.434	2.432	2.433	2.431	0.123
15 PFHxA	2.434	2.441	2.442	2.434	2.423	2.433	2.433	2.434	2.432	2.433	2.433	0.208
22 PFPeS	2.470	2.468	2.468	2.470	2.450	2.468	2.468	2.460	2.459	2.468	2.465	0.257
28 GenX	2.550	2.548	2.549	2.550	2.539	2.548	2.548	2.541	2.548	2.548	2.547	0.146
D 66 13C3_GenX	2.550	2.548	2.549	2.550	2.539	2.548	2.548	2.550	2.548	2.548	2.547	0.117
13 PFHpA	2.800	2.808	2.808	2.809	2.790	2.799	2.799	2.800	2.799	2.799	2.801	0.219
D 47 13C4_PFHpA	2.809	2.808	2.808	2.809	2.790	2.799	2.799	2.800	2.799	2.799	2.802	0.237
D 45 13C3_PFHxS	2.818	2.817	2.817	2.819	2.808	2.817	2.817	2.818	2.817	2.817	2.816	0.117
14 PFHxS	2.828	2.826	2.826	2.819	2.808	2.817	2.817	2.818	2.817	2.817	2.819	0.214
29 ADONA	2.846	2.845	2.845	2.846	2.826	2.844	2.844	2.836	2.844	2.844	2.842	0.214
2 6:2 FTS	3.160	3.152	3.158	3.160	3.145	3.158	3.158	3.153	3.158	3.158	3.156	0.159
D 64 13C2_6:2 FTS_2	3.160	3.158	3.165	3.154	3.145	3.158	3.158	3.153	3.158	3.158	3.156	0.175
D 53 13C8_PFOA	3.187	3.185	3.185	3.180	3.165	3.178	3.178	3.180	3.178	3.178	3.179	0.198
20 PFOA	3.187	3.185	3.185	3.180	3.171	3.185	3.185	3.180	3.178	3.185	3.182	0.148
* 41 13C2_PFOA	3.187	3.185	3.185	3.187	3.171	3.178	3.178	3.180	3.178	3.178	3.180	0.156
12 PFHpS	3.187	3.185	3.192	3.187	3.171	3.185	3.185	3.187	3.185	3.185	3.184	0.159
* 48 13C4_PFOS	3.560	3.566	3.558	3.560	3.534	3.550	3.558	3.552	3.550	3.558	3.554	0.245
D 54 13C8_PFOS	3.560	3.558	3.558	3.552	3.542	3.550	3.558	3.552	3.558	3.550	3.554	0.156
18 PFOS	3.552	3.550	3.558	3.560	3.542	3.558	3.558	3.560	3.550	3.558	3.554	0.162
17 PFNA	3.568	3.566	3.566	3.560	3.550	3.558	3.558	3.560	3.558	3.558	3.560	0.145
D 56 13C9_PFNA	3.568	3.558	3.566	3.560	3.550	3.558	3.558	3.560	3.558	3.558	3.559	0.132
30 9Cl-PF3ONS	3.766	3.765	3.765	3.766	3.751	3.765	3.758	3.766	3.765	3.765	3.763	0.136
D 55 13C8_PFOSA	3.844	3.843	3.843	3.845	3.827	3.843	3.843	3.844	3.843	3.843	3.842	0.143
19 PFOSA	3.853	3.843	3.843	3.845	3.835	3.843	3.843	3.844	3.843	3.843	3.843	0.111

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.902	3.901	3.901	3.902	3.884	3.901	3.901	3.902	3.901	3.901	3.899	0.133
3 8:2 FTS	3.894	3.909	3.901	3.910	3.892	3.901	3.901	3.902	3.901	3.901	3.901	0.146
D 65 13C2_8:2 FTS_2	3.910	3.909	3.901	3.902	3.892	3.901	3.901	3.910	3.901	3.901	3.902	0.144
10 PFDA	3.918	3.909	3.909	3.910	3.901	3.909	3.909	3.910	3.909	3.909	3.909	0.110
D 51 13C6_PFDA	3.910	3.909	3.909	3.910	3.901	3.909	3.909	3.910	3.909	3.909	3.908	0.074
* 37 13C2_PFDA	3.910	3.909	3.917	3.910	3.901	3.909	3.909	3.910	3.909	3.909	3.909	0.104
D 58 d3-MeFOSAA	4.069	4.076	4.067	4.068	4.057	4.067	4.067	4.069	4.066	4.067	4.067	0.109
6 N-MeFOSAA	4.078	4.076	4.076	4.068	4.057	4.075	4.075	4.069	4.075	4.067	4.071	0.156
9 PFDS	4.204	4.211	4.211	4.203	4.191	4.201	4.201	4.204	4.201	4.201	4.202	0.128
D 60 d5-EtFOSAA	4.225	4.232	4.232	4.234	4.211	4.221	4.221	4.225	4.231	4.232	4.226	0.170
D 52 13C7_PFUdA	4.225	4.232	4.221	4.224	4.211	4.221	4.221	4.225	4.221	4.221	4.222	0.122
5 N-EtFOSAA	4.235	4.232	4.232	4.234	4.221	4.231	4.231	4.235	4.231	4.232	4.231	0.096
25 PFUdA	4.235	4.232	4.232	4.224	4.221	4.221	4.221	4.225	4.221	4.221	4.225	0.131
D 61 d7-MeFOSE	4.275	4.272	4.272	4.274	4.262	4.272	4.272	4.275	4.272	4.272	4.271	0.093
32 MeFOSE	4.296	4.292	4.282	4.284	4.272	4.282	4.282	4.286	4.282	4.282	4.284	0.151
D 57 d3-MeFOSA	4.296	4.292	4.292	4.295	4.282	4.292	4.292	4.296	4.292	4.292	4.292	0.093
26 MeFOSA	4.306	4.302	4.302	4.295	4.292	4.302	4.302	4.296	4.302	4.302	4.300	0.107
31 11Cl-PF3OUDS	4.365	4.370	4.370	4.372	4.361	4.370	4.370	4.373	4.361	4.370	4.367	0.104
D 62 d9-EtFOSE	4.444	4.441	4.441	4.443	4.432	4.441	4.441	4.444	4.441	4.441	4.440	0.071
33 EtFOSE	4.453	4.450	4.459	4.461	4.450	4.450	4.459	4.452	4.450	4.459	4.454	0.096
D 59 d5-EtFOSA	4.462	4.459	4.459	4.461	4.459	4.459	4.459	4.461	4.459	4.468	4.460	0.058
27 EtFOSA	4.471	4.468	4.468	4.470	4.459	4.468	4.468	4.470	4.468	4.468	4.467	0.070
D 38 13C2_PFDoA	4.507	4.504	4.503	4.506	4.495	4.495	4.504	4.497	4.495	4.503	4.501	0.102
11 PFDoA	4.507	4.504	4.503	4.506	4.495	4.504	4.504	4.497	4.495	4.503	4.502	0.094
4 10:2 FTS	4.507	4.513	4.512	4.506	4.504	4.513	4.513	4.515	4.504	4.512	4.510	0.100
34 PFDOS	4.720	4.712	4.718	4.719	4.711	4.718	4.718	4.720	4.718	4.718	4.717	0.068
24 PFTrDA	4.747	4.746	4.745	4.746	4.738	4.738	4.745	4.747	4.738	4.745	4.743	0.078
D 42 13C2_PFTeDA	4.965	4.964	4.964	4.965	4.956	4.964	4.964	4.965	4.964	4.971	4.964	0.073
23 PFTeDA	4.965	4.964	4.964	4.965	4.956	4.964	4.971	4.965	4.964	4.971	4.965	0.085
35 PFHxDA	5.370	5.360	5.360	5.361	5.351	5.360	5.360	5.361	5.360	5.360	5.360	0.080
D 40 13C2_PFHxDA	5.361	5.360	5.360	5.361	5.351	5.360	5.360	5.361	5.360	5.360	5.359	0.053
36 PFODA	5.746	5.745	5.744	5.738	5.737	5.737	5.737	5.738	5.737	5.744	5.740	0.063

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521006.d
Injection Date: 05-Aug-2021 13:03:58 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 1 Auto Sampler: 1
Sample Info: F.L. ICAL 50_SVLC-1596 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.710	0	583037	21	>100:1			1000.00	1049.71	101.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.710	0/0	29270	22	34:1			50.000	50.231		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.078	2.066	1	567820	16	>100:1			1000.00	1090.84	105.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.078	2.066	1/0	31746	14	41:1			50.000	51.276		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.119	1	186163	15	>100:1			1000.00	1037.71	99.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.119	1/0	9917	14	86:1	Target = 3.26		44.200	44.680		
298.9 > 99	44	2.131	2.119		2929	12	44:1	3.38 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.470	2.450	2/1	8271	19	>100:1	Target = 3.15		46.900	49.511		
349 > 99	44	2.470	2.450		1778	19	32:1	4.65 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.388	1	109577	16	>100:1			5000.00	5484.22	106.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.388	1/0	1564	19		Target = 1.68		46.700	33.137		
327 > 81	63	2.434	2.388		2995	12	16:1	0.52 (0.84-2.53)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.434	2.423	1	578782	17	>100:1			1000.00	989.54	97.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.434	2.423	1/0	31578	16	99:1	Target = 18.18		50.000	52.214		
313 > 119	49	2.434	2.423		1789	22	17:1	17.65 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.550	2.539	1	1134331	17	>100:1			5000.00	5268.18	102.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.550	2.539	1/0	19924	17	28:1	Target = 0.79		100.00	125.77		
285 > 185	66	2.550	2.539		19966	17	71:1	0.99 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.790	2	501705	19	>100:1			1000.00	1037.16	104.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.800	2.790	1/-1	29210	15	63:1	Target = 3.65		50.000	52.120		
363 > 169	47	2.809	2.790		8570	18	32:1	3.40 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.808	1	141373	16				1000.00	1052.86	101.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.828	2.808	2/1	7413	28	88:1	Target = 3.10	0.19	45.500	47.871		
399 > 99	45	2.818	2.808		2294	21	13:1	3.23 (1.55-4.66)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.846	2.826	2/1	42317	15	>100:1	Target = 3.01		47.100	45.432		
377 > 85	45	2.846	2.826		14486	17	81:1	2.92 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.187	3.171	1/0	6512	25	>100:1	Target = 2.85		47.600	48.409		
449 > 99	45	3.187	3.171		2676	23	18:1	2.43 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.160	3.145	1	83586	19	>100:1			5000.00	5180.32	96.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.160	3.145	1/0	2101	16	18:1	Target = 1.74		47.400	51.699		
427 > 81	64	3.160	3.145		1548	23	20:1	1.35 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.187	3.165	2	513933	22	>100:1			1000.00	1103.32	105.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.187	3.171	1/-1	28695	23	17:1	Target = 2.92		50.000	56.096		
413 > 169	53	3.180	3.171		8525	20	46:1	3.36 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.560	3.542	2	132461	17	>100:1			1000.00	995.71	101.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.552	3.542	1/-1	6478	25	34:1	Target = 3.34	0.27	46.400	43.147		M
499 > 99	54	3.568	3.542		1952	30	17:1	3.31 (1.67-5.02)	0.12				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.766	3.751	1/-1	24402	17	>100:1			46.600	48.574		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.902	3.884	2/0	5927	20	17:1	Target = 2.63		48.000	54.676		
549 > 99	54	3.910	3.884		2484	20		2.38 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.204	4.191	1/-1	4835	20	38:1	Target = 2.65		48.200	44.160		
599 > 99	54	4.204	4.191		2004	17	19:1	2.41 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.361	1/-1	19591	18	>100:1			47.100	44.462		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.720	4.711	1/-1	4834	22	>100:1	Target = 3.08		48.400	48.750		
699 > 99	54	4.713	4.711		1538	22	12:1	3.14 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.568	3.550	2	604208	17	>100:1			1000.00	1060.51	104.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.568	3.550	2/0	37367	18	73:1	Target = 6.55		50.000	56.229		
463 > 169	56	3.568	3.550		4351	21	27:1	8.58 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.844	3.827	2	286429	18	>100:1			1000.00	1049.54	106.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.853	3.835	2/0	18220	19	61:1	Target = 33.36		50.000	56.780		
498>478	55	3.844	3.835		304	5	6.1:1	59.93 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.910	3.892	2	109412	18	>100:1			5000.00	5726.52	112.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.894	3.892	1/-1	1823	13	16:1	Target = 2.44		47.900	37.198		
527 > 81	65	3.894	3.892		293	4	4.4:1	6.22 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.507	4.504	1/-1	2718	20		Target = 3.72		48.200	48.121		
627 > 80	65	4.507	4.504		599	18	6.9:1	4.53 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.910	3.901	1	575067	17	>100:1			1000.00	1053.54	105.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.918	3.901	2/1	38261	15	56:1	Target = 13.09		50.000	57.252		
513 > 169	51	3.910	3.901		2649	19	27:1	14.44 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.057	1	663677	17	>100:1			5000.00	5305.39	111.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.078	4.057	2/1	5131	26	45:1	Target = 1.36	0.25	50.000	47.204		M
570 > 483	58	4.069	4.057		2995	25		1.71 (0.68-2.04)	0.25				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.211	1	612192	15	>100:1			1000.00	1033.17	96.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.235	4.221	1/0	33950	19	70:1	Target = 14.48		50.000	58.582		
563 > 169	52	4.225	4.221		1807	17	20:1	18.78 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.211	1	593250	16	>100:1			5000.00	5334.51	100.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.221	1/0	7523	22	34:1	Target = 1.63		50.000	60.441		M
584 > 526	60	4.225	4.221		3254	30	12:1	2.31 (0.81-2.44)	0.22				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.275	4.262	1	92559	13	>100:1			1000.00	1110.55	103.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.296	4.272	2/1	4665	18	29:1			50.000	44.736		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.296	4.282	1	53381	14	>100:1			1000.00	1059.04	105.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.306	4.292	1/0	3085	15	19:1	Target = 1.09		50.000	54.580		
512 > 219	57	4.306	4.292		2289	20	23:1	1.34 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.444	4.432	1	95553	16	>100:1			1000.00	1021.24	105.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.453	4.450	1/0	3767	10	40:1			50.000	41.269		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.462	4.459	1	44619	15	>100:1			1000.00	1009.03	102.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.471	4.459	1/0	2575	13	16:1	Target = 1.02		50.000	51.099		
526 > 219	59	4.471	4.459		3027	19	22:1	0.85 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.507	4.495	1	598213	15				1000.00	1025.60	100.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.507	4.495	1/0	33896	15	14:1	Target = 10.77		50.000	53.543		
613 > 169	38	4.507	4.495		2701	19	22:1	12.54 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.747	4.738	1/0	31747	19	80:1	Target = 8.06		50.000	56.318		
663 > 169	38	4.747	4.738		4050	19	50:1	7.83 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.965	4.956	1	909914	18	>100:1			1000.00	1017.20	100.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.965	4.956	1/0	35325	16	89:1	Target = 11.68		50.000	48.287		
713 > 169	42	4.979	4.956		2699	28	50:1	13.08 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.361	5.351	1	854713	18	>100:1			1000.00	1022.31	101.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.370	5.351	2/1	35432	22	8.2:1	Target = 10.53		50.000	59.721		
813 > 269	40	5.361	5.351		3684	24	>100:1	9.61 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.746	5.737	1/0	37466	23	>100:1	Target = 13.30		50.000	50.736		
913 > 319	40	5.746	5.737		2736	27	>100:1	13.69 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.910	3.901	1	680773	18							
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.434	2.423	1	604810	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.187	3.171	1	531307	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.705	1.710	0	531675	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.560	3.534	2	131459	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.826	2/1	84869	16	>100:1	Target = 3.01		94.200	86.672		
377 > 85	45	2.845	2.826		32362	19	>100:1	2.62 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.185	3.171	1/0	12301	24	>100:1	Target = 2.85		95.200	86.984		
449 > 99	45	3.185	3.171		4989	18	21:1	2.46 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.158	3.145	1	92580	20	>100:1			5000.00	5737.73	106.4	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.152	3.145	1/0	4352	19		Target = 1.74		94.800	96.686		
427 > 81	64	3.145	3.145		2286	15	39:1	1.90 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.185	3.165	2	502911	20	>100:1			1000.00	1079.66	103.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.185	3.171	1/-1	48423	23	42:1	Target = 2.92		100.00	96.738		
413 > 169	53	3.185	3.171		18574	20	>100:1	2.60 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.558	3.542	1	144256	18	>100:1			1000.00	1084.37	110.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.550	3.542	1/0	16709	41	91:1	Target = 3.34	0.23	92.800	102.19		
499 > 99	54	3.558	3.542		5851	29	33:1	2.85 (1.67-5.02)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.765	3.751	1/0	49558	19	>100:1			93.200	90.584		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.901	3.884	2/1	9416	21	64:1	Target = 2.63		96.000	79.759		
549 > 99	54	3.909	3.884		4034	24	17:1	2.33 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.211	4.191	2/1	11250	19	49:1	Target = 2.65		96.400	94.349		
599 > 99	54	4.211	4.191		4134	16	29:1	2.72 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.370	4.361	1/0	44577	14	>100:1			94.200	92.896		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.712	4.711	1/0	9647	17	>100:1	Target = 3.08		96.800	89.334		
699 > 99	54	4.712	4.711		3118	23	47:1	3.09 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.558	3.550	1	595015	18	>100:1			1000.00	1044.38	102.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.566	3.550	1/0	64290	19	>100:1	Target = 6.55		100.00	98.237		
463 > 169	56	3.574	3.550		9942	24	88:1	6.46 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.843	3.827	1	273954	17				1000.00	1003.83	102.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.843	3.835	1/0	30633	15	>100:1	Target = 33.36		100.00	99.811		
498>478	55	3.843	3.835		770	14	9.9:1	39.78 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.909	3.892	2	104418	17				5000.00	5465.14	107.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.909	3.892	2/0	5229	13	38:1	Target = 2.44		95.800	111.80		
527 > 81	65	3.901	3.892		2027	20		2.57 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.513	4.504	1/-1	5097	11		Target = 3.72		96.400	94.555		
627 > 80	65	4.495	4.504		1026	20	11:1	4.96 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.909	3.901	1	578423	16	>100:1			1000.00	1059.69	106.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.909	3.901	1/0	71551	16	>100:1	Target = 13.09		100.00	106.45		
513 > 169	51	3.909	3.901		5684	23	34:1	12.58 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.076	4.057	2	671506	16	>100:1			5000.00	5367.97	112.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.076	4.057	2/0	10424	25		Target = 1.36	0.09	100.00	94.781		
570 > 483	58	4.084	4.057		9388	27	57:1	1.11 (0.68-2.04)	0.35				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.232	4.211	2	637413	15	>100:1			1000.00	1075.73	100.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.232	4.221	1/-1	58880	16	>100:1	Target = 14.48		100.00	97.579		
563 > 169	52	4.221	4.221		4342	19	38:1	13.56 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.232	4.211	2	608417	15	>100:1			5000.00	5470.89	102.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.232	4.221	1/-1	11489	27	48:1	Target = 1.63	0.10	100.00	90.004		M
584 > 526	60	4.232	4.221		9362	28	39:1	1.22 (0.81-2.44)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.272	4.262	1	94355	16	>100:1			1000.00	1132.10	105.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.272	2/1	8422	20	55:1			100.00	79.227		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.292	4.282	1	47849	13	>100:1			1000.00	949.29	94.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.292	1/0	4588	11	33:1	Target = 1.09		100.00	90.555		
512 > 219	57	4.302	4.292		4905	15	40:1	0.93 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.441	4.432	1	98178	14	>100:1			1000.00	1049.29	108.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.450	4.450	1/0	10097	14	81:1			100.00	107.66		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.459	4.459	1	44782	14	>100:1			1000.00	1012.72	103.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.468	4.459	1/0	6179	12	44:1	Target = 1.02		100.00	122.17		
526 > 219	59	4.468	4.459		4801	21	47:1	1.28 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.504	4.495	1	607275	15	>100:1			1000.00	1041.14	101.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.504	4.495	1/0	60395	15	34:1	Target = 10.77		100.00	93.977		
613 > 169	38	4.504	4.495		5898	16	48:1	10.23 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.746	4.738	1/0	55550	17	>100:1	Target = 8.06		100.00	97.073		
663 > 169	38	4.746	4.738		6867	28	>100:1	8.08 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	4.956	1	904534	18	>100:1			1000.00	1011.19	100.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.964	4.956	1/0	76485	18	13:1	Target = 11.68		100.00	105.17		
713 > 169	42	4.964	4.956		5934	16	71:1	12.88 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.360	5.351	1	870724	17	>100:1			1000.00	1041.47	103	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.360	5.351	1/0	62652	18	11:1	Target = 10.53		100.00	103.66		
813 > 269	40	5.360	5.351		5896	16	>100:1	10.62 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.745	5.737	1/0	74001	22	>100:1	Target = 13.30		100.00	98.368		
913 > 319	40	5.745	5.737		5296	22	>100:1	13.97 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.909	3.901	1	656265	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.433	2.423	1	629952	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.185	3.171	1	523758	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.710	1	553692	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.566	3.534	2	137543	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521008.d
Injection Date: 05-Aug-2021 13:25:09 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 3 Auto Sampler: 3
Sample Info: F.L. ICAL 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.710	0	579662	21	>100:1			1000.00	1043.63	100.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.710	1/1	120379	20	>100:1			200.00	207.79		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.076	2.066	1	539405	17	>100:1			1000.00	1036.25	100.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.076	2.066	1/0	121879	15	>100:1			200.00	207.23		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.119	1	183412	15	>100:1			1000.00	1022.38	98	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.129	2.119	1/0	38716	16	>100:1	Target = 3.26		176.80	177.05		
298.9 > 99	44	2.129	2.119		12035	17	>100:1	3.21 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.468	2.450	2/1	27985	17	>100:1	Target = 3.15		187.60	170.03		
349 > 99	44	2.468	2.450		11285	22	>100:1	2.47 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.388	1	107112	17	>100:1			5000.00	5360.85	103.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.388	1/0	9434	22		Target = 1.68		186.80	204.48		
327 > 81	63	2.406	2.388		4773	25	69:1	1.97 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.423	1	621499	17	>100:1			1000.00	1062.57	104.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.423	2/1	129060	17	>100:1	Target = 18.18		200.00	198.73		
313 > 119	49	2.442	2.423		7077	17	75:1	18.23 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.549	2.539	1	1085948	17	>100:1			5000.00	5043.48	98.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.549	2.539	1/0	59984	18	>100:1	Target = 0.79		400.00	395.51		
285 > 185	66	2.549	2.539		77519	19	>100:1	0.77 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.808	2.790	2	494507	18	>100:1			1000.00	1022.28	103.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.808	2.790	2/0	116494	17	>100:1	Target = 3.65		200.00	210.89		
363 > 169	47	2.808	2.790		28978	16	>100:1	4.02 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.817	2.808	1	138208	16	>100:1			1000.00	1029.29	99	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.826	2.808	2/1	26202	24	>100:1	Target = 3.10	0.16	182.00	173.08		
399 > 99	45	2.826	2.808		7372	27	68:1	3.55 (1.55-4.66)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.826	2/1	175594	17	>100:1	Target = 3.01		188.40	192.84		
377 > 85	45	2.845	2.826		51849	17	>100:1	3.38 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.192	3.171	2/1	26423	27	>100:1	Target = 2.85		190.40	200.92		
449 > 99	45	3.192	3.171		9247	21	85:1	2.85 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.165	3.145	2	86720	21				5000.00	5374.55	99.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.158	3.145	1/-1	7252	17		Target = 1.74		189.60	172.00		M
427 > 81	64	3.152	3.145		5631	20	46:1	1.28 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.185	3.165	2	504574	21	>100:1			1000.00	1083.23	103.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.185	3.171	1/-1	98608	19	85:1	Target = 2.92		200.00	196.35		
413 > 169	53	3.185	3.171		33093	18	>100:1	2.97 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.558	3.542	1	130949	19	>100:1			1000.00	984.34	100.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.558	3.542	1/0	26521	41	>100:1	Target = 3.34	0.28	185.60	178.68		M
499 > 99	54	3.558	3.542		7465	31	52:1	3.55 (1.67-5.02)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.765	3.751	1/0	95859	20	>100:1			186.40	193.02		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.901	3.884	2/1	21638	15	>100:1	Target = 2.63		192.00	201.91		
549 > 99	54	3.901	3.884		8730	23	82:1	2.47 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.211	4.191	2/1	24025	22	>100:1	Target = 2.65		192.80	221.96		
599 > 99	54	4.211	4.191		8359	19		2.87 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.370	4.361	1/0	92373	15	>100:1			188.40	212.06		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.718	4.711	1/0	20369	24	>100:1	Target = 3.08		193.60	207.79		
699 > 99	54	4.718	4.711		6958	16		2.92 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.566	3.550	1	587138	18	>100:1			1000.00	1030.55	101.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.566	3.550	1/0	126231	17	>100:1	Target = 6.55		200.00	195.47		
463 > 169	56	3.566	3.550		19813	16	>100:1	6.37 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.843	3.827	1	298997	18	>100:1			1000.00	1095.59	111.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.843	3.835	1/0	63191	18	>100:1	Target = 33.36		200.00	188.65		
498>478	55	3.843	3.835		2958	24	22:1	21.36 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.901	3.892	1	98249	18				5000.00	5142.26	100.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.901	3.892	1/0	9193	14	47:1	Target = 2.44		191.60	208.90		
527 > 81	65	3.901	3.892		4464	22		2.05 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.512	4.504	1/0	8402	17	>100:1	Target = 3.72		192.80	165.65		
627 > 80	65	4.521	4.504		2798	17	16:1	3.00 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.909	3.901	1	571295	18	>100:1			1000.00	1046.63	105.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.909	3.901	1/0	128400	17	>100:1	Target = 13.09		200.00	193.40		
513 > 169	51	3.909	3.901		11300	21	>100:1	11.36 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.067	4.057	1	606917	17	>100:1			5000.00	4851.65	101.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.076	4.057	2/1	20816	29	77:1	Target = 1.36	0.13	200.00	209.41		
570 > 483	58	4.067	4.057		14871	29	91:1	1.39 (0.68-2.04)	0.11				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.221	4.211	1	603947	15	>100:1			1000.00	1019.25	95.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.232	4.221	1/0	117422	15	>100:1	Target = 14.48		200.00	205.38		
563 > 169	52	4.242	4.221		7438	15	49:1	15.78 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.232	4.211	2	589241	17	>100:1			5000.00	5298.46	99.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.232	4.221	1/-1	20216	31	>100:1	Target = 1.63	0.11	200.00	163.52		M
584 > 526	60	4.232	4.221		15888	29	>100:1	1.27 (0.81-2.44)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.272	4.262	1	79230	14	>100:1			1000.00	950.63	88.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.272	1/0	22204	15	93:1			200.00	248.75		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.292	4.282	1	48212	14	>100:1			1000.00	956.49	95.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.292	1/0	12717	19	>100:1	Target = 1.09		200.00	249.11		
512 > 219	57	4.302	4.292		10035	15	74:1	1.26 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.441	4.432	1	95648	16	>100:1			1000.00	1022.25	105.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.459	4.450	1/0	17580	15	99:1			200.00	192.40		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.459	4.459	0	44453	15	>100:1			1000.00	1005.28	102.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.468	4.459	1/1	9671	15	>100:1	Target = 1.02		200.00	192.63		
526 > 219	59	4.468	4.459		9669	15	>100:1	1.00 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.503	4.495	1	603858	16	>100:1			1000.00	1035.28	101.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.503	4.495	1/0	125378	17	54:1	Target = 10.77		200.00	196.20		
613 > 169	38	4.503	4.495		13270	21	84:1	9.44 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.745	4.738	1/0	116546	19	>100:1	Target = 8.06		200.00	204.82		
663 > 169	38	4.745	4.738		14270	18	>100:1	8.16 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	4.956	1	912519	19	>100:1			1000.00	1020.11	101.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.964	4.956	1/0	150117	19	23:1	Target = 11.68		200.00	204.61		
713 > 169	42	4.971	4.956		13552	17	>100:1	11.07 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.360	5.351	1	864574	17	>100:1			1000.00	1034.11	102.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.360	5.351	1/0	121064	19	29:1	Target = 10.53		200.00	201.73		
813 > 269	40	5.360	5.351		10935	16	>100:1	11.07 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.744	5.737	1/0	143971	22	15:1	Target = 13.30		200.00	192.74		
913 > 319	40	5.737	5.737		10536	22	>100:1	13.66 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.917	3.901	2	644351	18							
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.433	2.423	1	629151	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.185	3.171	1	503548	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.704	1.710	0	543608	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.558	3.534	2	142111	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521009.d
Injection Date: 05-Aug-2021 13:35:48 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 4 Auto Sampler: 4
Sample Info: F.L. ICAL 500_SVLC-1599 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.710	0	568958	21	>100:1			1000.00	1024.36	99	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.710	0/0	277713	20	>100:1			500.00	488.39		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.078	2.066	1	526259	16	>100:1			1000.00	1011.00	97.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.078	2.066	1/0	280685	17	>100:1			500.00	489.17		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.131	2.119	1	168263	17	>100:1			1000.00	937.93	89.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.131	2.119	1/0	93427	17	>100:1	Target = 3.26		442.00	465.70		
298.9 > 99	44	2.131	2.119		28659	15	>100:1	3.25 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.470	2.450	2/1	74815	16	>100:1	Target = 3.15		469.00	495.49		
349 > 99	44	2.470	2.450		23721	16	>100:1	3.15 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.388	1	96386	17	>100:1			5000.00	4824.03	93.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.388	1/0	20787	21	>100:1	Target = 1.68		467.00	500.69		
327 > 81	63	2.389	2.388		11273	18	>100:1	1.84 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.434	2.423	1	566329	17	>100:1			1000.00	968.25	95.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.434	2.423	1/0	302277	17	>100:1	Target = 18.18		500.00	510.81		
313 > 119	49	2.434	2.423		16243	23	>100:1	18.60 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.550	2.539	1	1080428	17	>100:1			5000.00	5017.84	97.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.550	2.539	1/0	144840	18	>100:1	Target = 0.79		1000.00	959.89		
285 > 185	66	2.550	2.539		188419	18	>100:1	0.76 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.790	2	526956	18	>100:1			1000.00	1089.36	110	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.790	2/0	273621	17	>100:1	Target = 3.65		500.00	464.83		
363 > 169	47	2.809	2.790		79044	18	>100:1	3.46 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.819	2.808	1	135982	18	>100:1			1000.00	1012.71	97.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.819	2.808	1/0	72342	24	>100:1	Target = 3.10	0.13	455.00	485.69		
399 > 99	45	2.819	2.808		21690	26	>100:1	3.33 (1.55-4.66)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.846	2.826	2/1	439311	17	>100:1	Target = 3.01		471.00	490.35		
377 > 85	45	2.846	2.826		147001	19	>100:1	2.98 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.187	3.171	1/0	65901	21	>100:1	Target = 2.85		476.00	509.32		
449 > 99	45	3.187	3.171		21171	18	>100:1	3.11 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.154	3.145	1	85921	26	>100:1			5000.00	5325.03	98.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.160	3.145	1/0	17945	26	>100:1	Target = 1.74		474.00	429.57		
427 > 81	64	3.160	3.145		11082	19		1.61 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.180	3.165	1	476730	21	>100:1			1000.00	1023.45	97.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.180	3.171	1/0	235791	19	>100:1	Target = 2.92		500.00	496.92		
413 > 169	53	3.180	3.171		77007	19	>100:1	3.06 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.552	3.542	1	134615	18	>100:1			1000.00	1011.90	103.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.560	3.542	2/1	67920	39	>100:1	Target = 3.34	0.29	464.00	445.14		
499 > 99	54	3.552	3.542		21253	38	97:1	3.19 (1.67-5.02)	0.16				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.766	3.751	1/0	236347	20	>100:1			466.00	462.94		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.902	3.884	2/1	55015	16	>100:1	Target = 2.63		480.00	499.39		
549 > 99	54	3.902	3.884		16329	15	>100:1	3.36 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.203	4.191	1/0	50937	14	>100:1	Target = 2.65		482.00	457.78		
599 > 99	54	4.203	4.191		25112	19		2.02 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.372	4.361	1/0	214561	16	>100:1			471.00	479.16		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.719	4.711	1/0	46489	18	>100:1	Target = 3.08		484.00	461.33		
699 > 99	54	4.719	4.711		15375	17	>100:1	3.02 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.560	3.550	1	547591	19	>100:1			1000.00	961.14	94.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.560	3.550	1/0	311244	20	>100:1	Target = 6.55		500.00	516.78		
463 > 169	56	3.560	3.550		50014	19	>100:1	6.22 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.845	3.827	2	266840	18	>100:1			1000.00	977.76	99.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.845	3.835	1/-1	149063	17	>100:1	Target = 33.36		500.00	498.64		
498>478	55	3.845	3.835		4751	12		31.37 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.902	3.892	1	95714	17				5000.00	5009.58	98.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.910	3.892	2/1	22396	17	95:1	Target = 2.44		479.00	522.39		
527 > 81	65	3.910	3.892		9280	22		2.41 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.506	4.504	1/0	29985	23	>100:1	Target = 3.72		482.00	606.84		
627 > 80	65	4.515	4.504		6128	20		4.89 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.910	3.901	1	603552	17	>100:1			1000.00	1105.73	111.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.910	3.901	1/0	320807	18	>100:1	Target = 13.09		500.00	457.39		
513 > 169	51	3.910	3.901		25407	17	76:1	12.62 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.068	4.057	1	675181	17	>100:1			5000.00	5397.35	113.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.068	4.057	1/0	57362	30	>100:1	Target = 1.36	0.12	500.00	518.73		M
570 > 483	58	4.068	4.057		34800	30	79:1	1.64 (0.68-2.04)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.224	4.211	1	611772	16	>100:1			1000.00	1032.46	96.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.224	4.221	1/0	292467	17	>100:1	Target = 14.48		500.00	505.01		
563 > 169	52	4.224	4.221		19621	20	39:1	14.90 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.234	4.211	2	563411	17	>100:1			5000.00	5066.20	95	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.234	4.221	1/-1	62327	30	>100:1	Target = 1.63	0.08	500.00	527.27		M
584 > 526	60	4.234	4.221		35218	31	>100:1	1.76 (0.81-2.44)	0.22				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.274	4.262	1	82884	13	>100:1			1000.00	994.47	93	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.284	4.272	1/0	48826	18	>100:1			500.00	522.88		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.295	4.282	1	46929	14	>100:1			1000.00	931.03	92.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.295	4.292	1/0	25385	12	>100:1	Target = 1.09		500.00	510.86		
512 > 219	57	4.295	4.292		23556	19	>100:1	1.07 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.443	4.432	1	95497	17	>100:1			1000.00	1020.64	105.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.461	4.450	1/0	43985	16	>100:1			500.00	482.15		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.461	4.459	1	45192	17	>100:1			1000.00	1021.99	104	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.470	4.459	1/0	23803	13	>100:1	Target = 1.02		500.00	466.36		
526 > 219	59	4.470	4.459		23246	22	>100:1	1.02 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.506	4.495	1	595993	16	>100:1			1000.00	1021.79	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.506	4.495	1/0	308664	16	>100:1	Target = 10.77		500.00	489.39		
613 > 169	38	4.506	4.495		28086	19		10.98 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.746	4.738	1/0	287461	19	>100:1	Target = 8.06		500.00	511.84		
663 > 169	38	4.746	4.738		33941	19	>100:1	8.46 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.965	4.956	1	901768	18	>100:1			1000.00	1008.09	99.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.965	4.956	1/0	364099	19	45:1	Target = 11.68		500.00	502.20		
713 > 169	42	4.965	4.956		30318	18	>100:1	12.00 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.361	5.351	1	844141	17	>100:1			1000.00	1009.67	99.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.361	5.351	1/0	300946	18	68:1	Target = 10.53		500.00	513.60		
813 > 269	40	5.361	5.351		26205	17	>100:1	11.48 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.738	5.737	1/0	355396	23	33:1	Target = 13.30		500.00	487.30		
913 > 319	40	5.738	5.737		26471	21	>100:1	13.42 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.910	3.901	1	676478	18							
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.434	2.423	1	591024	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.187	3.171	1	507041	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.705	1.710	0	523676	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.560	3.534	2	135999	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521010.d
Injection Date: 05-Aug-2021 13:46:22 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 5 Auto Sampler: 5
Sample Info: F.L. ICAL 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.710	1.710	0	574801	21	>100:1			1000.00	1034.88	100	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.710	1.710	0/0	570994	21	>100:1			1000.00	993.94		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	0	538043	16	>100:1			1000.00	1033.64	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	0/0	542650	15	>100:1			1000.00	925.00		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.119	2.119	0	187099	15	>100:1			1000.00	1042.93	100	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.119	2.119	0/0	194164	15	>100:1	Target = 3.26		884.00	870.41		
298.9 > 99	44	2.119	2.119		60765	15	>100:1	3.19 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.450	2.450	0/0	154629	17	>100:1	Target = 3.15		938.00	920.99		
349 > 99	44	2.459	2.450		51235	19	>100:1	3.01 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	0	103169	17	>100:1			5000.00	5163.51	100	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.388	2.388	0/0	41397	19	>100:1	Target = 1.68		934.00	931.57		
327 > 81	63	2.388	2.388		22602	18	>100:1	1.83 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.423	2.423	0	593317	18	>100:1			1000.00	1014.39	100	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.423	2.423	0/0	640129	17	>100:1	Target = 18.18		1000.00	1032.53		
313 > 119	49	2.423	2.423		36240	18	>100:1	17.66 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.539	2.539	0	1107213	18	>100:1			5000.00	5142.24	100	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.539	2.539	0/0	286949	17	>100:1	Target = 0.79		2000.00	1855.68		
285 > 185	66	2.539	2.539		385634	17	>100:1	0.74 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.790	2.790	0	479053	18	>100:1			1000.00	990.33	100	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.790	2.790	0/0	539535	18	>100:1	Target = 3.65		1000.00	1008.22		
363 > 169	47	2.790	2.790		162903	17	>100:1	3.31 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.808	2.808	0	139557	17	>100:1			1000.00	1039.34	100	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.808	2.808	0/0	126210	24	>100:1	Target = 3.10	0.18	910.00	825.64		
399 > 99	45	2.808	2.808		40504	22	>100:1	3.11 (1.55-4.66)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.826	2.826	0/0	857903	17	>100:1	Target = 3.01		942.00	933.04		
377 > 85	45	2.826	2.826		283159	18	>100:1	3.02 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.171	3.171	0/0	128621	21	>100:1	Target = 2.85		952.00	968.59		
449 > 99	45	3.171	3.171		44203	20	>100:1	2.90 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.145	3.145	0	86994	20				5000.00	5391.53	100	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.145	3.145	0/0	37898	21	>100:1	Target = 1.74		948.00	896.02		
427 > 81	64	3.138	3.145		20384	20	>100:1	1.85 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.165	3.165	0	486725	20	>100:1			1000.00	1044.91	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.171	3.171	0/0	478656	21	>100:1	Target = 2.92		1000.00	988.04		
413 > 169	53	3.165	3.171		163773	20	>100:1	2.92 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.542	3.542	0	130612	20	>100:1			1000.00	981.81	100	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.542	3.542	0/0	148235	35	>100:1	Target = 3.34	0.25	928.00	1001.29		
499 > 99	54	3.542	3.542		44431	36	>100:1	3.33 (1.67-5.02)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.751	3.751	0/0	461878	20	>100:1			932.00	932.42		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.884	3.884	0/0	113664	16	>100:1	Target = 2.63		960.00	1063.38		
549 > 99	54	3.884	3.884		40979	23	>100:1	2.77 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.191	4.191	0/0	107927	15	>100:1	Target = 2.65		964.00	999.70		
599 > 99	54	4.191	4.191		37964	18		2.84 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.361	4.361	0/0	391257	16	>100:1			942.00	900.54		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.711	4.711	0/0	95766	19	>100:1	Target = 3.08		968.00	979.46		
699 > 99	54	4.711	4.711		30503	19	>100:1	3.13 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.550	3.550	0	580651	20	>100:1			1000.00	1019.17	100	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.550	3.550	0/0	636270	18	>100:1	Target = 6.55		1000.00	996.29		
463 > 169	56	3.550	3.550		98656	17	>100:1	6.44 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.827	3.827	0	268160	18	>100:1			1000.00	982.60	100	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.835	3.835	0/0	320997	18	>100:1	Target = 33.36		1000.00	1068.50		
498>478	55	3.827	3.835		10434	18		30.76 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.892	3.892	0	97398	17	>100:1			5000.00	5097.72	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.892	3.892	0/0	42643	15	>100:1	Target = 2.44		958.00	977.46		
527 > 81	65	3.892	3.892		23162	25	>100:1	1.84 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.504	4.504	0/0	47695	21	>100:1	Target = 3.72		964.00	948.57		
627 > 80	65	4.504	4.504		14076	15	>100:1	3.38 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.901	3.901	0	542953	17	>100:1			1000.00	994.71	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.901	3.901	0/0	630572	18	>100:1	Target = 13.09		1000.00	999.38		
513 > 169	51	3.901	3.901		52758	17	>100:1	11.95 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.057	4.057	0	596376	16	>100:1			5000.00	4767.39	100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.057	4.057	0/0	97498	29	>100:1	Target = 1.36	0.11	1000.00	998.18		M
570 > 483	58	4.057	4.057		80617	32	>100:1	1.20 (0.68-2.04)	0.27				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.211	4.211	0	631526	16	>100:1			1000.00	1065.80	100	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.221	4.221	0/0	523324	17	>100:1	Target = 14.48		1000.00	875.36		
563 > 169	52	4.211	4.221		40089	15	>100:1	13.05 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.211	4.211	0	592804	16	>100:1			5000.00	5330.50	100	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.221	4.221	0/0	121761	34	>100:1	Target = 1.63		1000.00	978.99		M
584 > 526	60	4.221	4.221		79989	30	>100:1	1.52 (0.81-2.44)	0.09				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.262	4.262	0	89085	19	>100:1			1000.00	1068.87	100	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.272	4.272	0/0	85360	14	>100:1			1000.00	850.49		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.282	4.282	0	50589	14	>100:1			1000.00	1003.64	100	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.292	4.292	0/0	52881	13	>100:1	Target = 1.09		1000.00	987.20		
512 > 219	57	4.282	4.292		42080	14	>100:1	1.25 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.432	4.432	0	90529	14	>100:1			1000.00	967.54	100	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.450	4.450	0/0	91381	17	>100:1			1000.00	1056.66		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.459	4.459	0	43442	19	>100:1			1000.00	982.42	100	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.459	4.459	0/0	48659	13	>100:1	Target = 1.02		1000.00	991.76		
526 > 219	59	4.459	4.459		47399	14	>100:1	1.02 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.495	4.495	0	595792	15				1000.00	1021.45	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.495	4.495	0/0	681029	15	>100:1	Target = 10.77		1000.00	1080.14		
613 > 169	38	4.495	4.495		58073	23	>100:1	11.72 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.738	4.738	0/0	557498	19	>100:1	Target = 8.06		1000.00	993.00		
663 > 169	38	4.738	4.738		68304	20	>100:1	8.16 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.956	4.956	0	902749	17	>100:1			1000.00	1009.19	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.956	4.956	0/0	744560	20	>100:1	Target = 11.68		1000.00	1025.85		
713 > 169	42	4.964	4.956		62562	18	>100:1	11.90 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.351	5.351	0	845704	18	>100:1			1000.00	1011.54	100	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.351	5.351	0/0	577451	18	>100:1	Target = 10.53		1000.00	983.66		
813 > 269	40	5.351	5.351		57217	17	>100:1	10.09 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.737	5.737	0/0	722925	23	70:1	Target = 13.30		1000.00	989.40		
913 > 319	40	5.730	5.737		54866	23	>100:1	13.17 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.901	3.901	0	599597	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.423	2.423	0	618541	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.171	3.171	0	517799	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.710	1.710	0	536669	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.534	3.534	0	135966	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521011.d
Injection Date: 05-Aug-2021 13:56:58 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 6 Auto Sampler: 6
Sample Info: F.L. ICAL 2000_SVLC-1601 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.710	0	553883	21	>100:1			1000.00	997.22	96.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.710	1/1	1080902	20	>100:1			2000.00	1952.61		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.076	2.066	1	509525	17	>100:1			1000.00	978.85	94.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.076	2.066	1/0	1072391	16	>100:1			2000.00	1930.31		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.119	1	178632	14	>100:1			1000.00	995.73	95.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.129	2.119	1/0	378536	15	>100:1	Target = 3.26		1768.00	1777.35		
298.9 > 99	44	2.129	2.119		108919	16	>100:1	3.47 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.468	2.450	2/1	301597	17		Target = 3.15		1876.00	1881.50		
349 > 99	44	2.468	2.450		98332	17	>100:1	3.06 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.388	1	99788	18	>100:1			5000.00	4994.29	96.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.388	1/0	83654	18		Target = 1.68		1868.00	1946.27		
327 > 81	63	2.397	2.388		42650	17	>100:1	1.96 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.423	1	569799	17	>100:1			1000.00	974.18	96	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.423	1/0	1215658	18	>100:1	Target = 18.18		2000.00	2041.78		
313 > 119	49	2.433	2.423		68400	17	>100:1	17.77 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.548	2.539	1	1083907	18	>100:1			5000.00	5034.00	97.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.548	2.539	1/0	587381	18	>100:1	Target = 0.79		4000.00	3880.23		
285 > 185	66	2.548	2.539		756988	18	>100:1	0.77 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.799	2.790	1	468479	16	>100:1			1000.00	968.47	97.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.799	2.790	1/0	1103128	17	>100:1	Target = 3.65		2000.00	2107.92		
363 > 169	47	2.799	2.790		284250	17	>100:1	3.88 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.817	2.808	1	136474	18	>100:1			1000.00	1016.38	97.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.817	2.808	1/0	254230	26	>100:1	Target = 3.10	0.21	1820.00	1700.69		
399 > 99	45	2.817	2.808		83865	24	>100:1	3.03 (1.55-4.66)	0.15				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.844	2.826	2/1	1717105	18	>100:1	Target = 3.01		1884.00	1909.68		
377 > 85	45	2.844	2.826		557413	18	>100:1	3.08 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.185	3.171	1/0	236249	21	>100:1	Target = 2.85		1904.00	1819.29		
449 > 99	45	3.185	3.171		80617	21	>100:1	2.93 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.158	3.145	1	79864	20	>100:1			5000.00	4949.64	91.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.158	3.145	1/0	77690	27		Target = 1.74		1896.00	2000.81		
427 > 81	64	3.158	3.145		40395	20		1.92 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.178	3.165	1	447692	21	>100:1			1000.00	961.12	92	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.185	3.171	1/0	899953	20	>100:1	Target = 2.92		2000.00	2019.65		
413 > 169	53	3.185	3.171		308267	21	>100:1	2.91 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.550	3.542	1	140706	18	>100:1			1000.00	1057.68	107.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.558	3.542	1/0	282605	37	>100:1	Target = 3.34	0.27	1856.00	1771.99		
499 > 99	54	3.550	3.542		78758	32	>100:1	3.58 (1.67-5.02)	0.12				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.765	3.751	1/0	940627	20	>100:1			1864.00	1762.68		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.901	3.884	1/0	200250	16	>100:1	Target = 2.63		1920.00	1739.03		
549 > 99	54	3.901	3.884		76030	18	>100:1	2.63 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.201	4.191	1/0	206217	14	>100:1	Target = 2.65		1928.00	1773.10		
599 > 99	54	4.211	4.191		76623	14		2.69 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.370	4.361	1/0	788259	16	>100:1			1884.00	1684.14		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.718	4.711	1/0	184236	18		Target = 3.08		1936.00	1749.13		
699 > 99	54	4.718	4.711		58985	18		3.12 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.558	3.550	1	593674	19	>100:1			1000.00	1042.03	102.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.558	3.550	1/0	1257170	19	>100:1	Target = 6.55		2000.00	1925.32		
463 > 169	56	3.558	3.550		187241	19	>100:1	6.71 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.843	3.827	1	274235	17	>100:1			1000.00	1004.86	102.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.843	3.835	1/0	582479	17	>100:1	Target = 33.36		2000.00	1895.94		
498>478	55	3.843	3.835		22083	21	>100:1	26.37 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.901	3.892	1	91002	24				5000.00	4762.96	93.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.901	3.892	1/0	79914	17	>100:1	Target = 2.44		1916.00	1960.53		
527 > 81	65	3.901	3.892		41752	18		1.91 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.513	4.504	1/0	94764	15		Target = 3.72		1928.00	2017.16		
627 > 80	65	4.513	4.504		28390	15	>100:1	3.33 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.909	3.901	1	543755	17	>100:1			1000.00	996.18	100.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.909	3.901	1/0	1268223	17	>100:1	Target = 13.09		2000.00	2007.01		
513 > 169	51	3.909	3.901		94210	17	>100:1	13.46 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.067	4.057	1	567408	18	>100:1			5000.00	4535.82	95.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.075	4.057	2/1	206332	31	>100:1	Target = 1.36	0.08	2000.00	2220.27		M
570 > 483	58	4.067	4.057		153352	31	>100:1	1.34 (0.68-2.04)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.221	4.211	1	575835	14	>100:1			1000.00	971.81	91.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.221	4.221	1/0	1140686	15	>100:1	Target = 14.48		2000.00	2092.55		
563 > 169	52	4.221	4.221		79196	15	>100:1	14.40 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.221	4.211	1	561157	16	>100:1			5000.00	5045.93	94.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.231	4.221	1/0	234636	32	>100:1	Target = 1.63		2000.00	1992.92		M
584 > 526	60	4.231	4.221		154339	30	>100:1	1.52 (0.81-2.44)	0.22				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.272	4.262	1	80544	17	>100:1			1000.00	966.39	90.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.272	1/0	182362	15	>100:1			2000.00	2009.66		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.292	4.282	1	48342	16	>100:1			1000.00	959.07	95.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.292	1/0	105997	20	>100:1	Target = 1.09		2000.00	2070.77		
512 > 219	57	4.302	4.292		110584	13	>100:1	0.95 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.441	4.432	1	91417	20	>100:1			1000.00	977.03	101	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.450	4.450	1/0	183756	15	>100:1			2000.00	2104.18		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.459	4.459	1	42972	17	>100:1			1000.00	971.79	98.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.468	4.459	1/0	98383	18	>100:1	Target = 1.02		2000.00	2027.17		
526 > 219	59	4.468	4.459		92697	14	>100:1	1.06 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.495	4.495	1	595946	16	>100:1			1000.00	1021.71	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.504	4.495	1/0	1233069	15	>100:1	Target = 10.77		2000.00	1955.19		
613 > 169	38	4.504	4.495		118147	17	>100:1	10.43 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.738	4.738	1/0	1075994	19	>100:1	Target = 8.06		2000.00	1916.03		
663 > 169	38	4.738	4.738		131378	20	>100:1	8.19 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	4.956	1	880637	17	>100:1			1000.00	984.47	97.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.964	4.956	1/0	1438756	18	>100:1	Target = 11.68		2000.00	2032.07		
713 > 169	42	4.964	4.956		123148	19	>100:1	11.68 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.360	5.351	1	837783	17	>100:1			1000.00	1002.06	99.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.360	5.351	1/0	1117260	17	>100:1	Target = 10.53		2000.00	1921.20		
813 > 269	40	5.360	5.351		104585	17	>100:1	10.68 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.737	5.737	1/0	1423094	23	>100:1	Target = 13.30		2000.00	1966.08		
913 > 319	40	5.737	5.737		106718	22	>100:1	13.33 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.909	3.901	1	638773	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.433	2.423	1	558455	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.178	3.171	1	470704	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.704	1.710	0	514302	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.550	3.534	1	141542	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521012.d
Injection Date: 05-Aug-2021 14:07:33 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 7 Auto Sampler: 7
Sample Info: F.L. ICAL 5000_SVLC-1602 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.710	0	539298	20	>100:1			1000.00	970.96	93.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.704	1.710	0/0	2732761	21	>100:1			5000.00	5070.14		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.076	2.066	1	506458	15	>100:1			1000.00	972.96	94.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.076	2.066	1/0	2834581	15	>100:1			5000.00	5133.15		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.119	1	176862	14	>100:1			1000.00	985.87	94.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.129	2.119	1/0	960663	16	>100:1	Target = 3.26		4420.00	4555.78		
298.9 > 99	44	2.129	2.119		287157	14	>100:1	3.34 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.468	2.450	2/1	721589	17	>100:1	Target = 3.15		4690.00	4546.66		
349 > 99	44	2.468	2.450		255945	17		2.81 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.388	1	97929	16	>100:1			5000.00	4901.25	94.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.388	1/0	199789	16		Target = 1.68		4670.00	4736.47		
327 > 81	63	2.397	2.388		107768	17	>100:1	1.85 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.423	1	598753	18	>100:1			1000.00	1023.68	100.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.423	1/0	3033720	18	>100:1	Target = 18.18		5000.00	4848.95		
313 > 119	49	2.433	2.423		160055	16	>100:1	18.95 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.548	2.539	1	1084533	17	>100:1			5000.00	5036.91	98	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.548	2.539	1/0	1439607	18	>100:1	Target = 0.79		10000	9504.53		
285 > 185	66	2.548	2.539		1896699	18	>100:1	0.75 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.799	2.790	1	476471	17	>100:1			1000.00	984.99	99.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.799	2.790	1/0	2648376	17	>100:1	Target = 3.65		5000.00	4975.78		
363 > 169	47	2.799	2.790		690573	17	>100:1	3.83 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.817	2.808	1	126738	18				1000.00	943.87	90.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.817	2.808	1/0	676936	26	>100:1	Target = 3.10	0.19	4550.00	4876.28		
399 > 99	45	2.817	2.808		226776	22	>100:1	2.98 (1.55-4.66)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.844	2.826	2/1	4305847	18	>100:1	Target = 3.01		4710.00	5156.61		
377 > 85	45	2.844	2.826		1347073	18	>100:1	3.19 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.185	3.171	1/0	601126	21	>100:1	Target = 2.85		4760.00	4984.71		
449 > 99	45	3.185	3.171		198606	21	>100:1	3.02 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.158	3.145	1	76278	26	>100:1			5000.00	4727.40	87.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.158	3.145	1/0	175927	20		Target = 1.74		4740.00	4743.78		
427 > 81	64	3.152	3.145		94716	19	>100:1	1.85 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.178	3.165	1	444611	21	>100:1			1000.00	954.50	91.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.185	3.171	1/0	2294431	20	>100:1	Target = 2.92		5000.00	5184.78		
413 > 169	53	3.178	3.171		777110	22	>100:1	2.95 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.558	3.542	1	127507	20	>100:1			1000.00	958.47	97.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.558	3.542	1/0	699381	39	>100:1	Target = 3.34	0.27	4640.00	4839.19		M
499 > 99	54	3.558	3.542		202015	31	>100:1	3.46 (1.67-5.02)	0.09				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.758	3.751	1/0	2343873	20	>100:1			4660.00	4846.96		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.901	3.884	1/0	517354	17	>100:1	Target = 2.63		4800.00	4957.95		
549 > 99	54	3.901	3.884		190614	18	>100:1	2.71 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.201	4.191	1/0	546676	17	>100:1	Target = 2.65		4820.00	5187.01		
599 > 99	54	4.201	4.191		198927	17	>100:1	2.74 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.370	4.361	1/0	2170538	16	>100:1			4710.00	5117.47		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.718	4.711	1/0	491844	18	>100:1	Target = 3.08		4840.00	5152.91		
699 > 99	54	4.718	4.711		158145	19	>100:1	3.11 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.558	3.550	1	543663	19	>100:1			1000.00	954.25	93.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.558	3.550	1/0	3137237	19	>100:1	Target = 6.55		5000.00	5246.57		
463 > 169	56	3.558	3.550		497321	19	>100:1	6.30 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.843	3.827	1	267652	17	>100:1			1000.00	980.74	99.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.843	3.835	1/0	1470499	18	>100:1	Target = 33.36		5000.00	4904.12		
498>478	55	3.843	3.835		46300	17	>100:1	31.76 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.901	3.892	1	92312	15	>100:1			5000.00	4831.52	94.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.901	3.892	1/0	184022	16	>100:1	Target = 2.44		4790.00	4450.55		
527 > 81	65	3.901	3.892		103818	17		1.77 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.513	4.504	1/0	227853	17	>100:1	Target = 3.72		4820.00	4781.28		
627 > 80	65	4.513	4.504		70366	18		3.23 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.909	3.901	1	542435	17	>100:1			1000.00	993.76	99.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.909	3.901	1/0	3220144	17	>100:1	Target = 13.09		5000.00	5108.39		
513 > 169	51	3.909	3.901		234533	17	>100:1	13.73 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.067	4.057	1	622577	16	>100:1			5000.00	4976.84	104.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.075	4.057	2/1	508559	32		Target = 1.36	0.08	5000.00	4987.50		M
570 > 483	58	4.067	4.057		394311	32	>100:1	1.28 (0.68-2.04)	0.08				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.221	4.211	1	633919	14	>100:1			1000.00	1069.84	100.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.221	4.221	1/0	2703185	16	>100:1	Target = 14.48		5000.00	4504.54		
563 > 169	52	4.221	4.221		199936	15	>100:1	13.52 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.221	4.211	1	559787	16	>100:1			5000.00	5033.61	94.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.231	4.221	1/0	580937	33	>100:1	Target = 1.63		5000.00	4946.36		M
584 > 526	60	4.231	4.221		333728	31	>100:1	1.74 (0.81-2.44)	0.11				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.272	4.262	1	84384	21	>100:1			1000.00	1012.47	94.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.272	1/0	489419	15	>100:1			5000.00	5148.03		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.292	4.282	1	49467	15	>100:1			1000.00	981.38	97.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.292	1/0	256468	13	>100:1	Target = 1.09		5000.00	4896.45		
512 > 219	57	4.302	4.292		244347	15	>100:1	1.04 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.441	4.432	1	96518	17	>100:1			1000.00	1031.55	106.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.459	4.450	1/0	437130	15	>100:1			5000.00	4741.01		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.459	4.459	1	45634	14	>100:1			1000.00	1031.99	105	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.468	4.459	1/0	246463	16	>100:1	Target = 1.02		5000.00	4782.09		
526 > 219	59	4.468	4.459		242805	16	>100:1	1.01 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.504	4.495	1	604365	15	>100:1			1000.00	1036.15	101.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.504	4.495	1/0	3104224	15	>100:1	Target = 10.77		5000.00	4853.58		
613 > 169	38	4.504	4.495		289809	15	>100:1	10.71 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.745	4.738	1/0	2686493	19	>100:1	Target = 8.06		5000.00	4717.22		
663 > 169	38	4.745	4.738		353534	18	>100:1	7.59 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	4.956	1	894200	18	>100:1			1000.00	999.63	99.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.971	4.956	1/0	3730513	20	>100:1	Target = 11.68		5000.00	5188.99		
713 > 169	42	4.964	4.956		324230	18	>100:1	11.50 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.360	5.351	1	840438	17	>100:1			1000.00	1005.24	99.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.360	5.351	1/0	2813373	18	>100:1	Target = 10.53		5000.00	4822.48		
813 > 269	40	5.360	5.351		264270	17	>100:1	10.64 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.737	5.737	1/0	3651699	23	>100:1	Target = 13.30		5000.00	5029.07		
913 > 319	40	5.737	5.737		277259	23	>100:1	13.17 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.909	3.901	1	653149	16	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.433	2.423	1	596847	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.178	3.171	1	475387	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.704	1.710	0	509696	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.558	3.534	2	132480	16	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521013.d
Injection Date: 05-Aug-2021 14:18:14 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 8 Auto Sampler: 8
Sample Info: F.L. ICAL 10000_SVLC-1603 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.699	1.710	0	538949	20	>100:1			1000.00	970.33	93.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.705	1.710	0/0	5387255	21	>100:1			10000	10002		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.067	2.066	1	502499	16	>100:1			1000.00	965.35	93.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.067	2.066	1/0	5630957	15	>100:1			10000	10277		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.119	1	179385	15	>100:1			1000.00	999.93	95.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.119	1/0	1842416	15	>100:1	Target = 3.26		8840.00	8614.45		
298.9 > 99	44	2.120	2.119		560047	15	>100:1	3.28 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.460	2.450	1/0	1461090	18	>100:1	Target = 3.15		9380.00	9076.71		
349 > 99	44	2.460	2.450		490722	17	>100:1	2.97 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.389	2.388	1	97339	18	>100:1			5000.00	4871.72	94.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.389	2.388	1/0	393747	17	>100:1	Target = 1.68		9340.00	9391.29		
327 > 81	63	2.389	2.388		206972	17	>100:1	1.90 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.434	2.423	1	572424	17	>100:1			1000.00	978.67	96.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.434	2.423	1/0	5811197	17	>100:1	Target = 18.18		10000	9715.56		
313 > 119	49	2.434	2.423		335758	17	>100:1	17.30 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.550	2.539	1	1037197	18	>100:1			5000.00	4817.06	93.7	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.541	2.539	1/0	2820691	18	>100:1	Target = 0.79		20000	19473		
285 > 185	66	2.550	2.539		3602955	18	>100:1	0.78 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.800	2.790	1	487592	17	>100:1			1000.00	1007.98	101.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.800	2.790	1/0	5380903	17	>100:1	Target = 3.65		10000	9879.08		
363 > 169	47	2.800	2.790		1425042	17	>100:1	3.77 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.818	2.808	1	120218	16	>100:1			1000.00	895.31	86.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.808	1/0	1278063	25	>100:1	Target = 3.10	0.19	9100.00	9705.79		
399 > 99	45	2.818	2.808		410695	24	>100:1	3.11 (1.55-4.66)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.836	2.826	1/0	7869996	18	>100:1	Target = 3.01		9420.00	9936.14		
377 > 85	45	2.836	2.826		2506296	18	>100:1	3.14 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.187	3.171	1/0	1159700	20	>100:1	Target = 2.85		9520.00	10138		
449 > 99	45	3.187	3.171		396171	21	>100:1	2.92 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.153	3.145	1	78553	20	>100:1			5000.00	4868.39	90.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.153	3.145	1/0	347266	21	>100:1	Target = 1.74		9480.00	9092.65		
427 > 81	64	3.153	3.145		184181	21	>100:1	1.88 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.180	3.165	1	434718	21	>100:1			1000.00	933.26	89.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.180	3.171	1/0	4359533	21	>100:1	Target = 2.92		10000	10076		
413 > 169	53	3.180	3.171		1531140	21	>100:1	2.84 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.552	3.542	1	133503	17	>100:1			1000.00	1003.54	102.2	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.560	3.542	2/1	1400226	36	>100:1	Target = 3.34	0.27	9280.00	9253.37		M
499 > 99	54	3.552	3.542		439052	40	>100:1	3.18 (1.67-5.02)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.766	3.751	1/0	4832573	19	>100:1			9320.00	9544.58		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.902	3.884	2/1	1012425	17	>100:1	Target = 2.63		9600.00	9266.60		
549 > 99	54	3.902	3.884		401282	17	>100:1	2.52 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.204	4.191	1/0	1067543	15		Target = 2.65		9640.00	9674.20		
599 > 99	54	4.204	4.191		367193	15	>100:1	2.90 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.373	4.361	1/0	4199824	16	>100:1			9420.00	9457.19		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.720	4.711	1/0	958471	18	>100:1	Target = 3.08		9680.00	9590.63		
699 > 99	54	4.720	4.711		308193	17	>100:1	3.10 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.560	3.550	1	587688	18	>100:1			1000.00	1031.52	101.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.560	3.550	1/0	6053992	19	>100:1	Target = 6.55		10000	9365.97		
463 > 169	56	3.560	3.550		956728	19	>100:1	6.32 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.844	3.827	2	277015	17	>100:1			1000.00	1015.05	103.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.844	3.835	1/-1	2945612	17	>100:1	Target = 33.36		10000	9491.58		
498>478	55	3.844	3.835		102129	18	>100:1	28.84 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.910	3.892	2	95188	18	>100:1			5000.00	4982.05	97.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.902	3.892	1/-1	388926	18	>100:1	Target = 2.44		9580.00	9121.93		
527 > 81	65	3.902	3.892		210788	19		1.84 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.515	4.504	1/-1	436741	17		Target = 3.72		9640.00	8887.69		
627 > 80	65	4.515	4.504		124658	15	>100:1	3.50 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.910	3.901	1	517110	16	>100:1			1000.00	947.36	95.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.910	3.901	1/0	6027587	19	>100:1	Target = 13.09		10000	10030		
513 > 169	51	3.910	3.901		425579	18	>100:1	14.16 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.057	1	586416	16	>100:1			5000.00	4687.77	98.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.069	4.057	1/0	1009015	33	>100:1	Target = 1.36	0.08	10000	10506		M
570 > 483	58	4.069	4.057		767929	31	>100:1	1.31 (0.68-2.04)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.211	1	582568	16				1000.00	983.17	92.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.221	1/0	5553906	15	>100:1	Target = 14.48		10000	10071		
563 > 169	52	4.225	4.221		397417	15	>100:1	13.97 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.211	1	524300	16	>100:1			5000.00	4714.51	88.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.221	1/0	1106297	32	>100:1	Target = 1.63		10000	10057		M
584 > 526	60	4.235	4.221		643080	31	>100:1	1.72 (0.81-2.44)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.275	4.262	1	80807	13	>100:1			1000.00	969.55	90.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.286	4.272	1/0	930132	14	>100:1			10000	10217		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.296	4.282	1	54032	15	>100:1			1000.00	1071.95	106.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.296	4.292	1/0	524097	13	>100:1	Target = 1.09		10000	9160.60		
512 > 219	57	4.296	4.292		498971	13	>100:1	1.05 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.444	4.432	1	91068	20	>100:1			1000.00	973.30	100.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.452	4.450	1/0	938952	16	>100:1			10000	10793		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.461	4.459	1	46640	13	>100:1			1000.00	1054.74	107.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.470	4.459	1/0	477032	14	>100:1	Target = 1.02		10000	9056.16		
526 > 219	59	4.470	4.459		472392	15	>100:1	1.00 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.497	4.495	1	571044	16	>100:1			1000.00	979.02	95.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.497	4.495	1/0	5928328	15	>100:1	Target = 10.77		10000	9810.04		
613 > 169	38	4.497	4.495		547280	16	>100:1	10.83 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.747	4.738	1/0	5210130	19	>100:1	Target = 8.06		10000	9682.30		
663 > 169	38	4.747	4.738		657728	18	>100:1	7.92 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.965	4.956	1	854370	18	>100:1			1000.00	955.11	94.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.965	4.956	1/0	7165326	19	>100:1	Target = 11.68		10000	10431		
713 > 169	42	4.965	4.956		634826	17	>100:1	11.28 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.361	5.351	1	814992	18	>100:1			1000.00	974.80	96.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.361	5.351	1/0	5396284	17	>100:1	Target = 10.53		10000	9538.73		
813 > 269	40	5.361	5.351		530759	17	>100:1	10.16 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.738	5.737	1/0	7329992	23	>100:1	Target = 13.30		10000	10410		
913 > 319	40	5.738	5.737		557989	22	>100:1	13.13 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.910	3.901	1	598439	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.434	2.423	1	576353	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.180	3.171	1	469635	19	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.705	1.710	0	496075	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.552	3.534	2	133041	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521014.d
Injection Date: 05-Aug-2021 14:28:51 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 9 Auto Sampler: 9
Sample Info: F.L. ICAL 15000_SVLC-1604 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.710	0	516545	21	>100:1			1000.00	929.99	89.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.704	1.710	0/0	7621312	21	>100:1			15000	14763		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.076	2.066	1	488249	15	>100:1			1000.00	937.98	90.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.066	2.066	0/-1	7871752	14	>100:1			15000	14787		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.119	1	176633	17	>100:1			1000.00	984.59	94.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.129	2.119	1/0	2728326	16	>100:1	Target = 3.26		13260	12955		
298.9 > 99	44	2.129	2.119		805331	15	>100:1	3.38 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.459	2.450	1/0	2145936	17	>100:1	Target = 3.15		14070	13539		
349 > 99	44	2.459	2.450		714808	18	>100:1	3.00 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	0	89140	17	>100:1			5000.00	4461.37	86.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.388	1/1	579190	17		Target = 1.68		14010	15085		
327 > 81	63	2.388	2.388		313113	17	>100:1	1.84 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.423	1	567003	18	>100:1			1000.00	969.40	95.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.432	2.423	1/0	8766855	19	>100:1	Target = 18.18		15000	14797		
313 > 119	49	2.432	2.423		453537	17	>100:1	19.32 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.548	2.539	1	989435	19	>100:1			5000.00	4595.24	89.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.548	2.539	1/0	4189975	18	>100:1	Target = 0.79		30000	30322		
285 > 185	66	2.548	2.539		5124468	18	>100:1	0.81 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.799	2.790	1	446303	17	>100:1			1000.00	922.63	93.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.799	2.790	1/0	7440515	18	>100:1	Target = 3.65		15000	14924		
363 > 169	47	2.799	2.790		2050536	17	>100:1	3.62 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.817	2.808	1	132990	20				1000.00	990.43	95.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.817	2.808	1/0	1871129	26	>100:1	Target = 3.10	0.19	13650	12845		
399 > 99	45	2.817	2.808		621193	25	>100:1	3.01 (1.55-4.66)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.844	2.826	2/1	11260326	18	>100:1	Target = 3.01		14130	12851		
377 > 85	45	2.844	2.826		3814614	18	>100:1	2.95 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.185	3.171	1/0	1642901	21	>100:1	Target = 2.85		14280	12983		
449 > 99	45	3.185	3.171		550506	22	>100:1	2.98 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.158	3.145	1	68707	20	>100:1			5000.00	4258.18	79	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.158	3.145	1/0	487343	22	>100:1	Target = 1.74		14220	14589		
427 > 81	64	3.151	3.145		256409	22	>100:1	1.90 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.178	3.165	1	421315	21	>100:1			1000.00	904.49	86.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.178	3.171	1/0	5916935	21	>100:1	Target = 2.92		15000	14110		
413 > 169	53	3.178	3.171		2121412	21	>100:1	2.78 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.558	3.542	1	130718	18	>100:1			1000.00	982.60	100.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.550	3.542	1/0	1994908	37	>100:1	Target = 3.34	0.27	13920	13464		
499 > 99	54	3.550	3.542		573328	32	>100:1	3.47 (1.67-5.02)	0.12				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.765	3.751	1/0	6357949	20	>100:1			13980	12825		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.901	3.884	1/0	1418340	17	>100:1	Target = 2.63		14400	13258		
549 > 99	54	3.901	3.884		556445	18	>100:1	2.54 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.201	4.191	1/0	1499388	16	>100:1	Target = 2.65		14460	13877		
599 > 99	54	4.201	4.191		559688	16	>100:1	2.67 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.361	4.361	0/-1	5774472	16	>100:1			14130	13280		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.718	4.711	1/0	1379361	19	>100:1	Target = 3.08		14520	14096		
699 > 99	54	4.711	4.711		451219	18	>100:1	3.05 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.558	3.550	1	522260	19	>100:1			1000.00	916.68	89.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.558	3.550	1/0	8417210	19	>100:1	Target = 6.55		15000	14653		
463 > 169	56	3.558	3.550		1388076	19	>100:1	6.06 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.843	3.827	1	259856	19	>100:1			1000.00	952.17	96.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.843	3.835	1/0	4192324	17	>100:1	Target = 33.36		15000	14401		
498>478	55	3.851	3.835		131282	17	>100:1	31.93 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.901	3.892	1	82086	24				5000.00	4296.30	84.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.901	3.892	1/0	545750	18	>100:1	Target = 2.44		14370	14843		
527 > 81	65	3.901	3.892		280286	18	>100:1	1.94 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.504	4.504	1/0	610935	16	>100:1	Target = 3.72		14460	14417		
627 > 80	65	4.513	4.504		201700	16	>100:1	3.02 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.909	3.901	1	492926	19	>100:1			1000.00	903.06	90.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.909	3.901	1/0	8284110	18	>100:1	Target = 13.09		15000	14462		
513 > 169	51	3.909	3.901		621658	17	>100:1	13.32 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.066	4.057	1	613690	17	68:1			5000.00	4905.80	102.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.075	4.057	2/1	1384946	32	>100:1	Target = 1.36	0.11	15000	13779		M
570 > 483	58	4.066	4.057		1126728	31	>100:1	1.22 (0.68-2.04)	0.10				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.221	4.211	1	511026	16	>100:1			1000.00	862.44	80.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.221	4.221	0/-1	7294654	16	>100:1	Target = 14.48		15000	15079		
563 > 169	52	4.231	4.221		555936	16		13.12 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.231	4.211	2	484930	17	>100:1			5000.00	4360.50	81.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.231	4.221	1/-1	1531363	34	>100:1	Target = 1.63		15000	15051		M
584 > 526	60	4.231	4.221		978937	32	>100:1	1.56 (0.81-2.44)	0.09				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.272	4.262	1	73587	15	>100:1			1000.00	882.92	82.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.272	1/0	1285672	13	>100:1			15000	15508		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.292	4.282	1	50487	12	>100:1			1000.00	1001.62	99.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.292	1/0	719741	13	>100:1	Target = 1.09		15000	13464		
512 > 219	57	4.302	4.292		742737	15	>100:1	0.96 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.441	4.432	1	88321	15	>100:1			1000.00	943.94	97.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.450	4.450	1/0	1268546	16	>100:1			15000	15035		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.459	4.459	1	45846	13	>100:1			1000.00	1036.78	105.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.468	4.459	1/0	695997	14	>100:1	Target = 1.02		15000	13442		
526 > 219	59	4.468	4.459		687184	14	>100:1	1.01 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.495	4.495	1	524494	16	>100:1			1000.00	899.21	88	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.495	4.495	1/0	8699570	16	>100:1	Target = 10.77		15000	15673		
613 > 169	38	4.495	4.495		806266	15	>100:1	10.78 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.738	4.738	1/0	7516321	19	>100:1	Target = 8.06		15000	15208		
663 > 169	38	4.738	4.738		899929	18	>100:1	8.35 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	4.956	1	869439	18	>100:1			1000.00	971.95	96.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.964	4.956	1/0	9862676	20	>100:1	Target = 11.68		15000	14109		
713 > 169	42	4.964	4.956		901304	20	>100:1	10.94 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.360	5.351	1	791293	17	>100:1			1000.00	946.46	93.6	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.360	5.351	1/0	7654353	17	>100:1	Target = 10.53		15000	13935		
813 > 269	40	5.360	5.351		724443	17	>100:1	10.56 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.737	5.737	1/0	10337513	23	>100:1	Target = 13.30		15000	15121		
913 > 319	40	5.737	5.737		813667	23	>100:1	12.70 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.909	3.901	1	573738	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.432	2.423	1	566357	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.178	3.171	1	451035	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.704	1.710	0	467408	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.550	3.534	1	132929	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521015.d
Injection Date: 05-Aug-2021 14:39:31 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 10 Auto Sampler: 10
Sample Info: F.L. ICAL 20000_SVLC-1605 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.710	0	521110	20	>100:1			1000.00	938.21	90.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.704	1.710	0/0	10322261	21	>100:1			20000	19820		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.066	2.066	1	496034	16	>100:1			1000.00	952.93	92.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.076	2.066	1/0	10787319	14	>100:1			20000	19945		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.119	1	174515	15	>100:1			1000.00	972.78	93.3	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.129	2.119	1/0	3722753	16	>100:1	Target = 3.26		17680	17892		
298.9 > 99	44	2.129	2.119		1087811	16	>100:1	3.42 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.468	2.450	2/1	2982201	17	>100:1	Target = 3.15		18760	19043		
349 > 99	44	2.468	2.450		1003777	17	>100:1	2.97 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	1	100337	17	>100:1			5000.00	5021.77	97.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.397	2.388	1/0	797598	17	>100:1	Target = 1.68		18680	18455		
327 > 81	63	2.388	2.388		425328	17	>100:1	1.87 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.423	1	541168	17	>100:1			1000.00	925.23	91.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.423	1/0	11701956	18	>100:1	Target = 18.18		20000	20694		
313 > 119	49	2.433	2.423		608500	18	>100:1	19.23 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.548	2.539	1	1029391	18	>100:1			5000.00	4780.81	93	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.548	2.539	1/0	5449351	17	>100:1	Target = 0.79		40000	37905		
285 > 185	66	2.548	2.539		7001804	18	>100:1	0.77 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.799	2.790	1	440921	17	>100:1			1000.00	911.50	92	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.799	2.790	1/0	9845240	18	>100:1	Target = 3.65		20000	19989		
363 > 169	47	2.799	2.790		2631547	17	>100:1	3.74 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.817	2.808	1	122588	18				1000.00	912.96	87.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.817	2.808	1/0	2467177	25	>100:1	Target = 3.10	0.19	18200	18374		
399 > 99	45	2.817	2.808		799900	25	>100:1	3.08 (1.55-4.66)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.844	2.826	2/1	15026001	17	>100:1	Target = 3.01		18840	18604		
377 > 85	45	2.844	2.826		5251336	18	>100:1	2.86 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.185	3.171	1/0	2109380	21	>100:1	Target = 2.85		19040	18084		
449 > 99	45	3.192	3.171		728446	21	>100:1	2.89 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.158	3.145	1	67562	20	>100:1			5000.00	4187.22	77.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.158	3.145	1/0	678625	22	>100:1	Target = 1.74		18960	20659		
427 > 81	64	3.158	3.145		357411	21	>100:1	1.89 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.178	3.165	1	424838	21	>100:1			1000.00	912.05	87.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.185	3.171	1/0	8051702	22	>100:1	Target = 2.92		20000	19041		
413 > 169	53	3.178	3.171		2859392	20	>100:1	2.81 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.550	3.542	1	124994	19	>100:1			1000.00	939.58	95.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.558	3.542	1/0	2644821	36	>100:1	Target = 3.34	0.31	18560	18668		
499 > 99	54	3.558	3.542		749965	31	>100:1	3.52 (1.67-5.02)	0.10				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.765	3.751	1/0	9093104	20	>100:1			18640	19182		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.901	3.884	1/0	1975281	18	>100:1	Target = 2.63		19200	19310		
549 > 99	54	3.901	3.884		758025	18	>100:1	2.60 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.201	4.191	1/0	2007873	16	>100:1	Target = 2.65		19280	19434		
599 > 99	54	4.201	4.191		761220	16	>100:1	2.63 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.370	4.361	1/0	8199262	16	>100:1			18840	19720		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.718	4.711	1/0	1996024	18	>100:1	Target = 3.08		19360	21332		
699 > 99	54	4.718	4.711		627134	18		3.18 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.558	3.550	1	535422	19	>100:1			1000.00	939.78	92.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.558	3.550	1/0	11311416	19	>100:1	Target = 6.55		20000	19208		
463 > 169	56	3.558	3.550		1865207	19	>100:1	6.06 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.843	3.827	1	255949	17	>100:1			1000.00	937.86	95.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.843	3.835	1/0	5845215	17	>100:1	Target = 33.36		20000	20385		
498>478	55	3.843	3.835		185416	24		31.52 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.901	3.892	1	89531	17	>100:1			5000.00	4685.97	91.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.901	3.892	1/0	705150	18	>100:1	Target = 2.44		19160	17584		
527 > 81	65	3.901	3.892		373329	18		1.88 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.512	4.504	1/0	856703	16	>100:1	Target = 3.72		19280	18535		
627 > 80	65	4.512	4.504		253159	17	>100:1	3.38 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.909	3.901	1	490892	17	>100:1			1000.00	899.33	90.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.909	3.901	1/0	10462370	18	>100:1	Target = 13.09		20000	18340		
513 > 169	51	3.909	3.901		789366	18	>100:1	13.25 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.067	4.057	1	650996	16	64:1			5000.00	5204.02	109.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.067	4.057	1/0	2022812	32	>100:1	Target = 1.36	0.09	20000	18972		M
570 > 483	58	4.067	4.057		1496384	30	>100:1	1.35 (0.68-2.04)	0.13				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.221	4.211	1	525183	16	>100:1			1000.00	886.33	83.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.221	4.221	1/0	9752333	16	>100:1	Target = 14.48		20000	19616		
563 > 169	52	4.232	4.221		709289	16	>100:1	13.74 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.232	4.211	2	483195	17	>100:1			5000.00	4344.89	81.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.232	4.221	1/-1	2119058	34	>100:1	Target = 1.63		20000	20903		M
584 > 526	60	4.232	4.221		1269042	31	>100:1	1.66 (0.81-2.44)	0.26				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.272	4.262	1	76015	14	>100:1			1000.00	912.05	85.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.272	1/0	1855061	15	>100:1			20000	21661		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.292	4.282	1	54765	13	>100:1			1000.00	1086.49	108.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.292	1/0	1067069	14	>100:1	Target = 1.09		20000	18401		
512 > 219	57	4.302	4.292		1005623	14	>100:1	1.06 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.441	4.432	1	92931	16	>100:1			1000.00	993.21	102.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.459	4.450	1/0	1834314	15	>100:1			20000	20662		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.468	4.459	1	38615	17	>100:1			1000.00	873.26	88.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.468	4.459	1/0	956762	14	>100:1	Target = 1.02		20000	21938		
526 > 219	59	4.468	4.459		966380	17	>100:1	0.99 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.503	4.495	1	535827	16	>100:1			1000.00	918.64	89.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.503	4.495	1/0	11060221	16	>100:1	Target = 10.77		20000	19505		
613 > 169	38	4.503	4.495		1100323	18		10.05 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.745	4.738	1/0	9882522	19	>100:1	Target = 8.06		20000	19572		
663 > 169	38	4.745	4.738		1250138	18	>100:1	7.90 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.971	4.956	1	915148	18	>100:1			1000.00	1023.05	101.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.971	4.956	1/0	13120795	20	>100:1	Target = 11.68		20000	17833		
713 > 169	42	4.964	4.956		1255844	20	>100:1	10.44 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.360	5.351	1	796204	17	>100:1			1000.00	952.33	94.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.360	5.351	1/0	10407257	19	>100:1	Target = 10.53		20000	18830		
813 > 269	40	5.360	5.351		1001171	19	>100:1	10.39 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.744	5.737	1/0	14253151	24	>100:1	Target = 13.30		20000	20720		
913 > 319	40	5.737	5.737		1111785	23	>100:1	12.82 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.909	3.901	1	596061	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.433	2.423	1	582971	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.178	3.171	1	449899	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.704	1.710	0	493921	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.558	3.534	2	130700	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521016.d
Injection Date: 05-Aug-2021 14:50:11 Injection Vol: 10.0 uL
Sample Type: InstBlk Auto Sampler: 11
Lab Sample ID: ID IBLK A Lab Prep. Batch:
Sample Info: ID IBLK A Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.710	0	563393	21	>100:1			1001.00	1014.34	98	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.685	1.710	-1/-1	1401	11	-0.860:1			2.4906	2.4906		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.076	2.066	1	528206	17	>100:1			1001.00	1014.74	98.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.066		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.119	1	191250	15	>100:1			1001.00	1066.07	102.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.119		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.450		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.397	2.388	1	101099	24	>100:1			5005.00	5059.91	98	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.388		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.423	1	610282	17	>100:1			1001.00	1043.40	102.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.423	2/1	1201	13	0.584:1	Target = 17.66		1.8852	1.8852		
313 > 119	49	2.441	2.423		372	17	3.6:1	3.22 (8.83-26.49)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.548	2.539	1	1099376	18	>100:1			5005.00	5105.84	99.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.539		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.808	2.790	2	516488	19	>100:1			1001.00	1067.72	107.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.790		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.817	2.808	1	142775	18	>100:1			1001.00	1063.30	102.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.808		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.826		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.171		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.165	3.145	2	79603	19	>100:1			5005.00	4933.47	91.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.145		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.185	3.165	2	483614	20	>100:1			1001.00	1038.23	99.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.171		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.550	3.542	1	134617	18				1001.00	1011.91	103.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.408	3.542	-8/-9	133	12		Target = 3.33		0.87253	0.87253		
499 > 99	54	3.401	3.542		127	38		1.04 (1.66-5.00)	1.88				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.780	3.751	2/1	436	11	4.6:1			0.85485	0.85485		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.884		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.201	4.191	1/0	162	12	1.5:1	Target = 2.84		1.4574	1.4574		
599 > 99	54	4.211	4.191		249	13		0.65 (1.42-4.26)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.292	4.361	-4/-5	202	13	1.4:1			0.45155	0.45155		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.907	4.711	12/11	149	11	3.4:1	Target = 3.13		1.4801	1.4801		
699 > 99	54	4.890	4.711		59	13		2.52 (1.56-4.70)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.558	3.550	1	607936	19	>100:1			1001.00	1067.06	104.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.550		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.843	3.827	1	284984	18	>100:1			1001.00	1044.25	106.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.835		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.901	3.892	1	101214	16	>100:1			5005.00	5297.44	103.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.892		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.504		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.909	3.901	1	552238	17	>100:1			1001.00	1011.72	101.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.901		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.067	4.057	1	675955	17	>100:1			5005.00	5403.54	113.3	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.057		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.221	4.211	1	654124	14				1001.00	1103.94	103.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.221		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.221	4.211	1	586247	16	>100:1			5005.00	5271.54	98.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.221	4.221	1/0	596	14	9.8:1	Target = 1.52		4.8504	4.8504		
584 > 526	60	4.242	4.221		831	45		0.71 (0.76-2.28)	0.21				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.272	4.262	1	89102	13	>100:1			1001.00	1069.07	100	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.333	4.272	4/3	506	13	2.2:1			5.0457	5.0457		

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.292	4.282	1	48100	13	>100:1			1001.00	954.26	95.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.292		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.441	4.432	1	88764	15	>100:1			1001.00	948.68	98.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.450		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.468	4.459	1	49100	14	>100:1			1001.00	1110.37	113	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.459	4.459	1/0	1075	22	7.4:1	Target = 1.02		19.405	19.405		
526 > 219	59	4.468	4.459		600	8	5.1:1	1.79 (0.51-1.53)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.504	4.495	1	584877	17	>100:1			1001.00	1002.74	98.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.495		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.738		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	4.956	1	912952	19	>100:1			1001.00	1020.60	101.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.956		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.360	5.351	1	871068	17	>100:1			1001.00	1041.88	103	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.368	5.351	2/1	7267	15	42:1	Target = 10.09		12.031	12.031		
813 > 269	40	5.368	5.351		620	23	26:1	11.72 (5.04-15.13)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.737	5.737	0/-1	4242	17	15:1	Target = 13.17		5.6422	5.6422		
913 > 319	40	5.737	5.737		383	19	11:1	11.07 (6.58-19.76)					
*** 37 13C2_PFDA**													
515 > 470		3.909	3.901	1	735419	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.432	2.423	1	685327	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.178	3.171	1	571676	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.704	1.710	0	587328	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.558	3.534	2	156303	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521017.d
Injection Date: 05-Aug-2021 15:00:44 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC-1590 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	508.95	101.8	70 - 130
D 46 13C4_PFBA	574801	584519			101.7	50 - 150
D 50 13C5_PFPeA	538043	540558			100.5	50 - 150
21 PFPeA			500.00	505.52	101.1	70 - 130
7 PFBS			442.50	445.92	100.8	70 - 130
D 44 13C3_PFBS	187099	194897			104.2	50 - 150
1 4:2 FTS			467.50	478.92	102.4	70 - 130
D 63 13C2_4:2 FTS_2	103169	103808			100.6	50 - 150
D 49 13C5_PFHxA	593317	613342			103.4	50 - 150
15 PFHxA			500.00	507.37	101.5	70 - 130
22 PFPeS			470.00	456.95	97.2	70 - 130
28 GenX			2500.00	2543.58	101.7	70 - 130
D 66 13C3_GenX	1107213	1104532			99.8	50 - 150
D 47 13C4_PFHpA	479053	501669			104.7	50 - 150
13 PFHpA			500.00	496.57	99.3	70 - 130
D 45 13C3_PFHxS	139557	143853			103.1	50 - 150
14 PFHxS			456.00	437.87	96	70 - 130
29 ADONA			2355.00	2337.45	99.3	70 - 130
D 64 13C2_6:2 FTS_2	86994	83231			95.7	50 - 150
2 6:2 FTS			475.00	471.45	99.3	70 - 130
D 53 13C8_PFOA	486725	471107			96.8	50 - 150
20 PFOA			500.00	548.79	109.8	70 - 130
12 PFHpS			475.00	463.32	97.5	70 - 130
18 PFOS			462.75	485.70	105	70 - 130
D 54 13C8_PFOS	130612	135578			103.8	50 - 150
17 PFNA			500.00	510.05	102	70 - 130
D 56 13C9_PFNA	580651	607340			104.6	50 - 150
30 9Cl-PF3ONS			2330.00	2269.04	97.4	70 - 130
D 55 13C8_PFOSA	268160	282766			105.4	50 - 150
19 PFOSA			500.00	474.64	94.9	70 - 130
16 PFNS			480.00	508.95	106	70 - 130
D 65 13C2_8:2 FTS_2	97398	95446			98	50 - 150
3 8:2 FTS			480.00	515.63	107.4	70 - 130
10 PFDA			500.00	495.47	99.1	70 - 130
D 51 13C6_PFDA	542953	542834			100	50 - 150
6 N-MeFOSAA			500.00	609.36	121.9	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	671124			112.5	50 - 150
9 PFDS			482.50	530.30	109.9	70 - 130
D 60 d5-EtFOSAA	592804	626242			105.6	50 - 150
D 52 13C7_PFUdA	631526	651171			103.1	50 - 150
5 N-EtFOSAA			500.00	548.52	109.7	70 - 130
25 PFUdA			500.00	492.70	98.5	70 - 130
D 61 d7-MeFOSE	89085	84985			95.4	50 - 150
D 57 d3-MeFOSA	50589	45816			90.6	50 - 150
31 11Cl-PF3OUDS			2355.00	2329.77	98.9	70 - 130
D 62 d9-EtFOSE	90529	99587			110	50 - 150
D 59 d5-EtFOSA	43442	49688			114.4	50 - 150
11 PFDoA			500.00	539.25	107.8	70 - 130
D 38 13C2_PFDoA	595792	611700			102.7	50 - 150
4 10:2 FTS			2410.00	2521.55	104.6	70 - 130
24 PFTrDA			500.00	528.71	105.7	70 - 130
23 PFTeDA			500.00	549.35	109.9	70 - 130
D 42 13C2_PFTeDA	902749	914773			101.3	50 - 150
D 40 13C2_PFHxDA	845704	919211			108.7	50 - 150

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521017.d
Injection Date: 05-Aug-2021 15:00:44 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC-1590 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.710	0	584519	21	>100:1			1000.00	1052.38	101.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.710	1/1	297324	19	>100:1			500.00	508.95		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.078	2.066	1	540558	17	>100:1			1000.00	1038.47	100.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.078	2.066	1/0	297949	16	>100:1			500.00	505.52		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.119	1	194897	16	>100:1			1000.00	1086.40	104.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.119	1/0	103619	15	>100:1	Target = 3.26		442.50	445.92		
298.9 > 99	44	2.130	2.119		29625	15	>100:1	3.49 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.469	2.450	2/1	79916	17	>100:1	Target = 3.15		470.00	456.95		
349 > 99	44	2.469	2.450		24602	22	>100:1	3.24 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.388	1	103808	19	>100:1			5000.00	5195.49	100.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.388	1/0	21414	18	>100:1	Target = 1.68		467.50	478.92		
327 > 81	63	2.398	2.388		15091	23	>100:1	1.41 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.434	2.423	1	613342	17	>100:1			1000.00	1048.63	103.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.443	2.423	2/1	325169	18	>100:1	Target = 18.18		500.00	507.37		
313 > 119	49	2.443	2.423		19185	18	89:1	16.94 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.550	2.539	1	1104532	17	>100:1			5000.00	5129.79	99.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.550	2.539	1/0	392368	18	>100:1	Target = 0.79		2500.00	2543.58		
285 > 185	66	2.550	2.539		493902	18	>100:1	0.79 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.809	2.790	2	501669	18	>100:1			1000.00	1037.08	104.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.809	2.790	2/0	278280	18	>100:1	Target = 3.65		500.00	496.57		
363 > 169	47	2.809	2.790		69870	15	>100:1	3.98 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.808	2	143853	17	>100:1			1000.00	1071.33	103.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.818	2.808	1/-1	68995	26	>100:1	Target = 3.10	0.19	456.00	437.87		
399 > 99	45	2.827	2.808		24572	22	>100:1	2.80 (1.55-4.66)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.846	2.826	2/0	2215380	17	>100:1	Target = 3.01		2355.00	2337.45		
377 > 85	45	2.846	2.826		717187	18	>100:1	3.08 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.194	3.171	2/0	63419	19	>100:1	Target = 2.85		475.00	463.32		
449 > 99	45	3.194	3.171		19941	19	>100:1	3.18 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.167	3.145	2	83231	21				5000.00	5158.32	95.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.160	3.145	1/-1	19078	24	>100:1	Target = 1.74		475.00	471.45		
427 > 81	64	3.160	3.145		10439	24	96:1	1.82 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.187	3.165	2	471107	20	>100:1			1000.00	1011.38	96.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.187	3.171	1/-1	257330	21	>100:1	Target = 2.92		500.00	548.79		
413 > 169	53	3.187	3.171		88240	21	>100:1	2.91 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.560	3.542	2	135578	17	>100:1			1000.00	1019.14	103.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.560	3.542	2/0	74639	36	>100:1	Target = 3.34	0.19	462.75	485.70		M
499 > 99	54	3.560	3.542		22007	33	>100:1	3.39 (1.67-5.02)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.766	3.751	1/-1	1166707	19	>100:1			2330.00	2269.04		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.894	3.884	1/-1	56470	18	>100:1	Target = 2.63		480.00	508.95		
549 > 99	54	3.902	3.884		21552	21	99:1	2.62 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.204	4.191	1/-1	59428	21		Target = 2.65		482.50	530.30		
599 > 99	54	4.204	4.191		24990	20		2.37 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.361	1/-1	1050703	15	>100:1			2355.00	2329.77		
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.560	3.550	1	607340	19	>100:1			1000.00	1066.01	104.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.560	3.550	1/0	340710	19	>100:1	Target = 6.55		500.00	510.05		
463 > 169	56	3.560	3.550		56518	19	>100:1	6.02 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.844	3.827	2	282766	18	>100:1			1000.00	1036.12	105.4	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.844	3.835	1/-1	150359	18	>100:1	Target = 33.36		500.00	474.64		
498>478	55	3.844	3.835		3720	23	35:1	40.41 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.902	3.892	1	95446	19	>100:1			5000.00	4995.55	98	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.894	3.892	1/0	22044	17	>100:1	Target = 2.44		480.00	515.63		
527 > 81	65	3.910	3.892		10041	23		2.19 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.506	4.504	1/0	124245	15	>100:1	Target = 3.72		2410.00	2521.55		
627 > 80	65	4.506	4.504		34742	16		3.57 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.910	3.901	1	542834	17	>100:1			1000.00	994.49	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.910	3.901	1/0	312556	22	>100:1	Target = 13.09		500.00	495.47		
513 > 169	51	3.910	3.901		23265	25	>100:1	13.43 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.057	1	671124	17	>100:1			5000.00	5364.92	112.5	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.078	4.057	2/1	66979	22	>100:1	Target = 1.36		500.00	609.36		
570 > 483	58	4.069	4.057		44228	16	>100:1	1.51 (0.68-2.04)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.211	1	651171	15	>100:1			1000.00	1098.95	103.1	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.221	1/0	303720	15	>100:1	Target = 14.48		500.00	492.70		
563 > 169	52	4.225	4.221		18578	17		16.34 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.211	1	626242	17	>100:1			5000.00	5631.17	105.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.221	1/0	72070	22	>100:1	Target = 1.63		500.00	548.52		
584 > 526	60	4.235	4.221		39313	14	>100:1	1.83 (0.81-2.44)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.275	4.262	1	84985	19	>100:1			1000.00	1019.68	95.4	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.296	4.282	1	45816	13	>100:1			1000.00	908.95	90.6	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.444	4.432	1	99587	16	>100:1			1000.00	1064.35	110	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.462	4.459	1	49688	14	>100:1			1000.00	1123.67	114.4	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.498	4.495	1	611700	17	>100:1			1000.00	1048.72	102.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.498	4.495	1/0	349075	16	>100:1	Target = 10.77		500.00	539.25		
613 > 169	38	4.498	4.495		31785	15	>100:1	10.98 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.747	4.738	1/0	304759	19	>100:1	Target = 8.06		500.00	528.71		
663 > 169	38	4.740	4.738		38327	17	>100:1	7.95 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.965	4.956	1	914773	17	>100:1			1000.00	1022.63	101.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.965	4.956	1/0	404029	20	65:1	Target = 11.68		500.00	549.35		
713 > 169	42	4.965	4.956		34576	18	>100:1	11.68 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.361	5.351	1	919211	17	>100:1			1000.00	1099.46	108.7	
*** 37 13C2_PFDA**													
515 > 470		3.910	3.901	1	646575	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.434	2.423	1	596778	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.187	3.171	1	492835	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.705	1.710	0	533946	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.560	3.534	2	144162	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b\080521018.d
Injection Date: 05-Aug-2021 15:11:18 Injection Vol: 10.0 uL
Sample Type: CheckStd Auto Sampler: 13
Sample Info: ISOMER CHECK_SVLC-1562 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: IsomerCheck Conc. Level: Smp Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.704	1.710	0	706564	21	>100:1			1000.00	1272.11	122.9	
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.076	2.066	1	663420	17	>100:1			1000.00	1274.50	123.3	
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.129	2.119	1	213749	16	>100:1			1000.00	1191.48	114.2	
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.388	2.388	0	135570	16	>100:1			5000.00	6785.15	131.4	
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.432	2.423	1	764764	17	>100:1			1000.00	1307.51	128.9	
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.548	2.539	1	1394196	17	>100:1			5000.00	6475.08	125.9	
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.808	2.790	2	599196	17	>100:1			1000.00	1238.70	125.1	
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.817	2.808	1	177675	17	>100:1			1000.00	1323.22	127.3	
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.158	3.145	1	104007	20	>100:1			5000.00	6445.93	119.6	
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.184	3.165	2	566295	21	>100:1			1000.00	1215.73	116.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.184	3.171	1/-1	7356643	32	>100:1	Target = 2.92	0.17	10000	13052		
413 > 169	53	3.184	3.171		2692954	35	>100:1	2.73 (1.46-4.38)	0.27				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.557	3.542	1	169438	17	>100:1			1000.00	1273.66	129.7	
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.557	3.550	1	707093	19	>100:1			1000.00	1241.10	121.8	
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.842	3.827	1	348560	17	>100:1			1000.00	1277.20	130	
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.908	3.892	1	133770	18	>100:1			5000.00	7001.39	137.3	
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.908	3.901	1	761921	18	>100:1			1000.00	1395.87	140.3	
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.074	4.057	1	748828	17	>100:1			5000.00	5986.08	125.6	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.074	4.057	1/0	1916372	32	>100:1	Target = 1.20	0.09	10000	15625		M
570 > 483	58	4.074	4.057		1391736	32	>100:1	1.37 (0.60-1.81)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.229	4.211	2	818792	14	>100:1			1000.00	1381.84	129.7	
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.229	4.211	2	763276	16	>100:1			5000.00	6863.39	128.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.229	4.221	1/-1	1977650	33	>100:1	Target = 1.52		10000	12349		M
584 > 526	60	4.229	4.221		1213208	32	>100:1	1.63 (0.76-2.28)	0.25				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.280	4.262	2	100900	14				1000.00	1210.63	113.3	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.290	4.282	1	65813	13	>100:1			1000.00	1305.68	130.1	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.440	4.432	1	120622	16	>100:1			1000.00	1289.16	133.2	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.467	4.459	1	55661	16	>100:1			1000.00	1258.74	128.1	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.503	4.495	1	780940	17	>100:1			1000.00	1338.88	131.1	
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.964	4.956	1	1127234	18	>100:1			1000.00	1260.14	124.9	
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.359	5.351	1	1118579	17	>100:1			1000.00	1337.92	132.3	
*** 37 13C2_PFDA**													
515 > 470		3.908	3.901	1	829202	17							
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.432	2.423	1	715778	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.184	3.171	1	585419	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.704	1.710	0	621405	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.557	3.534	2	167803	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Report Date: 21-Aug-2021 12:36:25 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	082021013.d	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13
2	082021014.d	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51
3	082021015.d	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26
4	082021016.d	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05
5	082021017.d	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39
6	082021018.d	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14
7	082021019.d	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48
8	082021020.d	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29
9	082021021.d	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07
10	082021022.d	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	L-5 +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.674	3.098	3.207	3.181	3.700	3.492	3.392	3.468	3.459	3.469	3.414	3.103-4.296	0.19895	1.850
1 4:2 FTS	0.648	1.402	1.453	1.505	1.793	1.706	1.709	1.855	1.910	1.864	1.584	0.659-2.926	0.37794	0.896
15 PFHxA	20.986	15.528	19.135	19.396	20.319	18.078	17.821	18.757	18.646	18.310	18.697	16.050-24.587	1.42273	10.159
22 PFPeS	2.946	2.931	3.331	2.941	2.714	2.838	2.725	3.008	2.926	2.939	2.929	2.190-3.237	0.17448	1.357
28 GenX	0.815	0.731	0.763	0.743	0.823	0.819	0.754	0.783	0.812	0.777	0.782	0.720-0.925	0.03409	0.411
13 PFHpA	3.913	3.910	4.099	3.631	3.706	3.525	3.694	3.844	3.689	3.524	3.753	3.136-4.275	0.18967	1.853
14 PFHxS	2.174	2.674	2.378	2.771	2.791	3.159	2.804	2.919	3.171	3.103	2.794	1.814-3.767	0.32551	1.395
29 ADONA	3.404	3.407	3.136	3.256	3.551	3.102	3.342	2.990	2.945	2.990	3.212	2.938-4.163	0.20427	1.775
2 6:2 FTS	2.385	2.243	1.860	1.793	1.821	1.823	1.990	1.824	1.862	1.888	1.948	1.153-2.488	0.22243	0.910
20 PFOA	3.083	3.563	2.689	2.667	2.905	2.898	2.876	2.765	2.859	2.854	2.915	2.136-3.673	0.25624	1.452
12 PFHpS	4.119	2.659	2.819	2.909	2.932	2.919	2.980	3.058	3.004	2.914	3.031	1.756-4.107	0.39177	1.466
17 PFNA	5.828	7.144	6.483	6.705	6.621	7.065	6.594	5.987	6.222	6.192	6.484	5.346-7.895	0.42486	3.310
18 PFOS	3.257	3.567	3.186	3.034	3.590	3.369	3.434	3.520	3.395	3.459	3.381	3.055-4.124	0.17821	1.795
19 PFOSA	45.840	26.854	26.101	30.090	34.574	30.039	33.416	33.002	30.593	31.700	32.220	17.090-52.057	5.82797	17.287
16 PFNS	2.626	3.657	2.213	2.873	2.581	2.747	3.068	2.742	2.716	2.782	2.800	1.503-3.658	0.35918	1.290
10 PFDA	15.497	16.295	12.739	15.112	12.784	12.471	13.850	14.146	13.660	12.833	13.938	8.789-16.778	1.33162	6.392
3 8:2 FTS	Disabled	1.346	2.659	2.372	2.035	1.850	1.832	1.801	1.933	1.870	1.966	0.946-3.123	0.36272	1.017
6 N-MeFOSAA	1.431	1.017	1.552	1.319	1.311	1.304	1.305	1.329	1.302	1.325	1.319	0.837-1.784	0.15776	0.655
9 PFDS	4.458	4.488	2.960	3.444	2.714	2.635	2.726	2.847	2.649	2.635	3.155	0.393-5.034	0.77351	1.357
25 PFUdA	14.824	15.776	12.099	14.317	13.548	15.639	12.572	14.946	13.315	13.077	14.011	8.028-19.067	1.83987	6.774
5 N-EtFOSAA	2.128	2.098	1.982	1.796	1.614	1.547	1.652	1.554	1.611	1.518	1.750	0.828-2.399	0.26194	0.807
26 MeFOSA	1.340	1.171	0.871	1.056	0.844	1.022	0.976	1.034	1.080	1.054	1.044	0.418-1.269	0.14168	0.422
27 EtFOSA	1.520	0.917	1.067	1.004	1.019	1.035	0.992	1.023	0.949	0.989	1.051	0.494-1.543	0.17498	0.509
11 PFDoA	11.681	9.117	10.306	11.188	10.425	10.868	10.652	10.913	9.834	10.240	10.522	8.369-12.480	0.68511	5.212
4 10:2 FTS	3.903	4.201	3.007	2.534	3.743	3.280	3.163	3.289	3.034	3.325	3.347	2.348-5.137	0.46474	1.871
34 PFDOS	2.558	2.982	3.279	3.246	2.998	2.959	3.025	2.962	3.040	3.064	3.011	2.412-3.583	0.19506	1.499
24 PFTrDA	6.688	7.234	6.811	7.701	8.052	7.917	7.624	7.976	7.893	7.301	7.519	6.545-9.558	0.50222	4.026
23 PFTeDA	10.950	11.447	11.502	11.343	11.303	11.411	11.130	11.068	10.817	10.306	11.127	10.192-12.413	0.37024	5.651
35 PFHxDA	10.647	10.023	10.817	11.033	10.668	10.563	10.888	11.070	10.643	10.570	10.692	9.768-11.567	0.29977	5.334
36 PFODA	11.849	14.480	13.500	13.647	13.569	13.369	13.580	13.529	12.852	12.599	13.297	11.326-15.811	0.74751	6.784

Report Date: 21-Aug-2021 12:36:25 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	082021013.d	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13
2	082021014.d	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51
3	082021015.d	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26
4	082021016.d	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05
5	082021017.d	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39
6	082021018.d	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14
7	082021019.d	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48
8	082021020.d	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29
9	082021021.d	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07
10	082021022.d	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	617	632	620	606	612	610	587	564	585	578	Avg:A Wt:C2	601		RSD=3.6	
	102.7	105.1	103.1	100.8	101.8	101.6	97.7	93.9	97.3	96.2	Org:N Dep:R				
8 PFBA	1.128720	1.041643	1.049716	1.034108	1.067269	1.012516	1.096593	1.081459	0.995072	1.011554	Avg:A Wt:C2	1.051865		RSD=4.0	
	107.3	99	99.8	98.3	101.5	96.3	104.3	102.8	94.6	96.2	Org:N Dep:R				
D 50 13C5_PFPeA	642	646	636	641	630	639	616	571	597	596	Avg:A Wt:C2	621		RSD=4.1	
	103.3	104	102.4	103.2	101.3	102.8	99.1	91.9	96.1	95.9	Org:N Dep:R				
21 PFPeA	1.162404	1.117030	1.019116	1.051473	1.081656	1.052306	1.093582	1.119401	1.009725	1.026322	Avg:A Wt:C2	1.073301		RSD=4.7	
	108.3	104.1	95	98	100.8	98	101.9	104.3	94.1	95.6	Org:N Dep:R				
D 44 13C3_PFBS	188	193	186	190	194	193	186	185	181	191	Avg:A Wt:C2	189		RSD=2.2	
	99.7	102.5	98.5	100.7	102.6	102.1	98.5	97.9	96.1	101.4	Org:N Dep:R				
7 PFBS	1.578396	1.317806	1.237623	1.228698	1.297635	1.257719	1.303221	1.265183	1.275548	1.265599	Avg:A Wt:C2	1.302743		RSD=7.7	
	121.2	101.2	95	94.3	99.6	96.5	100	97.1	97.9	97.1	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
1 4:2 FTS	1.807447	2.638137	2.077719	1.923504	2.134919	2.020312	2.006705	2.359216	1.990817	2.250092	Avg:A Wt:C2	2.120887		RSD=11.3	
	85.2	124.4	98	90.7	100.7	95.3	94.6	111.2	93.9	106.1	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	21.3132	20.7060	21.8748	20.5616	21.1182	20.6842	21.1520	18.0190	21.9538	20.2386	Avg:A Wt:C2	20.7621		RSD=5.3	
	102.7	99.7	105.4	99	101.7	99.6	101.9	86.8	105.7	97.5	Org:N Dep:R				
D 49 13C5_PFHxA	686	648	629	703	649	676	680	650	627	659	Avg:A Wt:C2	661		RSD=3.8	
	103.8	98.1	95.2	106.3	98.3	102.4	102.9	98.4	94.9	99.7	Org:N Dep:R				
15 PFHxA	1.187075	1.047821	1.020141	0.947742	1.127037	0.955635	0.920017	0.993106	0.984186	0.947618	Avg:A Wt:C2	1.013038		RSD=8.5	
	117.2	103.4	100.7	93.6	111.3	94.3	90.8	98	97.2	93.5	Org:N Dep:R				
22 PFPeS	0.842555	0.802335	0.937696	0.864883	0.842459	0.827245	0.861519	0.872004	0.890581	0.871057	Avg:A Wt:C2	0.861233		RSD=4.3	
	97.8	93.2	108.9	100.4	97.8	96.1	100	101.3	103.4	101.1	Org:N Dep:R				
28 GenX	0.945681	0.743521	0.689800	0.664174	0.708970	0.713439	0.663983	0.689316	0.697698	0.675410	Ln:A Wt:C2	0.673128	23.6768	R^2=0.997	
	105.3	92.9	93.7	95.2	103.6	105.1	98.3	102.2	103.5	100.3	Org:N Dep:R			RSE=5	
D 66 13C3_GenX	247	246	235	238	244	236	240	220	229	226	Avg:A Wt:C2	236		RSD=3.8	
	104.6	104.3	99.6	100.7	103.4	99.9	101.6	93.2	97.1	95.6	Org:N Dep:R				
13 PFHpA	1.240877	1.166952	1.143162	1.111780	1.078455	1.065436	1.055609	1.146786	1.114864	1.043696	Avg:A Wt:C2	1.116762		RSD=5.4	
	111.1	104.5	102.4	99.6	96.6	95.4	94.5	102.7	99.8	93.5	Org:N Dep:R				
D 47 13C4_PFHpA	524	547	553	559	574	532	557	486	513	516	Avg:A Wt:C2	536		RSD=4.9	
	97.7	102	103.2	104.2	107	99.2	103.8	90.8	95.7	96.3	Org:N Dep:R				
D 45 13C3_PFHxS	135	151	151	146	147	144	140	132	141	139	Avg:A Wt:C2	142		RSD=4.5	
	94.6	106.1	105.9	102.3	103.1	100.9	98.5	92.5	98.8	97.4	Org:N Dep:R				
14 PFHxS	1.066690	1.181421	1.126948	1.045113	1.081209	1.090399	1.062555	1.124839	1.100705	1.105706	Avg:A Wt:C2	1.098558		RSD=3.6	
	97.1	107.5	102.6	95.1	98.4	99.3	96.7	102.4	100.2	100.7	Org:N Dep:R				
29 ADONA	7.518989	7.039757	6.552487	7.073507	7.586510	6.909073	7.392763	6.900277	6.365317	6.777996	Avg:A Wt:C2	7.011668		RSD=5.7	
	107.2	100.4	93.5	100.9	108.2	98.5	105.4	98.4	90.8	96.7	Org:N Dep:R				
2 6:2 FTS	2.998609	3.177386	2.505293	2.171849	2.345683	2.529857	2.296124	2.637983	2.277211	2.282192	Avg:A Wt:C2	2.522219		RSD=13.2	
	118.9	126	99.3	86.1	93	100.3	91	104.6	90.3	90.5	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	17.5046	19.0262	18.5346	19.1606	19.3816	17.9802	19.0454	15.3556	16.9358	17.6656	Avg:A Wt:C2	18.0590		RSD=6.9	
	96.9	105.4	102.6	106.1	107.3	99.6	105.5	85	93.8	97.8	Org:N Dep:R				
D 53 13C8_PFOA	601	582	581	622	564	567	563	529	512	506	Avg:A Wt:C2	563		RSD=6.7	
	106.9	103.5	103.3	110.6	100.2	100.8	100	93.9	90.9	89.9	Org:N Dep:R				
20 PFOA	1.125874	1.125166	0.929049	0.895486	1.018262	0.990294	0.988765	0.953596	0.945546	1.006436	Avg:A Wt:C2	0.997847		RSD=7.7	
	112.8	112.8	93.1	89.7	102	99.2	99.1	95.6	94.8	100.9	Org:N Dep:R				
12 PFHpS	1.346717	1.053252	1.018516	1.064064	1.016927	1.026210	1.064063	1.026115	0.940035	0.969221	Avg:A Wt:C2	1.052512		RSD=10.5	
	128	100.1	96.8	101.1	96.6	97.5	101.1	97.5	89.3	92.1	Org:N Dep:R				
D 54 13C8_PFOS	152	152	144	150	149	145	137	127	140	139	Avg:A Wt:C2	144		RSD=5.5	
	105.8	106.1	100.1	104.2	104	101.2	95.4	88.8	97.2	97.1	Org:N Dep:R				
D 56 13C9_PFNA	679	715	680	668	663	656	659	620	622	642	Avg:A Wt:C2	660		RSD=4.3	
	102.8	108.3	102.9	101.1	100.3	99.4	99.8	93.9	94.2	97.3	Org:N Dep:R				
17 PFNA	1.112627	1.063337	1.075724	1.037724	1.084006	1.104368	1.104857	1.064969	1.051807	0.998279	Avg:A Wt:C2	1.069770		RSD=3.3	
	104	99.4	100.6	97	101.3	103.2	103.3	99.6	98.3	93.3	Org:N Dep:R				
18 PFOS	1.252705	1.165365	1.126777	1.062569	1.062276	1.067198	1.190475	1.196046	1.127515	1.150029	Avg:A Wt:C2	1.140095		RSD=5.6	
	109.9	102.2	98.8	93.2	93.2	93.6	104.4	104.9	98.9	100.9	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
30 9Cl-PF3ONS	3.977556	3.502440	3.845390	3.410858	3.396166	3.528752	3.943055	4.239882	3.612344	3.775502	Avg:A Wt:C2	3.723194		RSD=7.5	
	106.8	94.1	103.3	91.6	91.2	94.8	105.9	113.9	97	101.4	Org:N Dep:R				
D 55 13C8_PFOSA	318	294	310	300	313	292	304	302	285	285	Avg:A Wt:C2	300		RSD=3.8	
	105.9	97.8	103.1	99.8	104.3	97.3	101.2	100.6	95	95	Org:N Dep:R				
19 PFOSA	1.014355	1.062533	0.978467	0.999276	1.055907	1.115413	1.017026	1.012920	1.072565	1.116999	Avg:A Wt:C2	1.044546		RSD=4.6	
	97.1	101.7	93.7	95.7	101.1	106.8	97.4	97	102.7	106.9	Org:N Dep:R				
16 PFNS	0.793588	0.971999	0.730939	0.894077	0.784396	0.833647	0.959841	0.847457	0.819008	0.817409	Avg:A Wt:C2	0.845236		RSD=9.0	
	93.9	115	86.5	105.8	92.8	98.6	113.6	100.3	96.9	96.7	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	21.6514	21.4574	20.8050	23.4084	22.1666	20.3804	22.2806	18.3890	19.9854	20.1546	Avg:A Wt:C2	21.0679		RSD=6.8	
	102.8	101.8	98.8	111.1	105.2	96.7	105.8	87.3	94.9	95.7	Org:N Dep:R				
10 PFDA	1.312548	1.174268	1.040218	1.116284	1.041629	1.019065	1.122576	1.144935	1.046091	1.053352	Avg:A Wt:C2	1.107097		RSD=8.1	
	118.6	106.1	94	100.8	94.1	92	101.4	103.4	94.5	95.1	Org:N Dep:R				
D 51 13C6_PFDA	634	665	670	635	663	668	644	569	583	606	Avg:A Wt:C2	634		RSD=5.8	
	100	105	105.7	100.2	104.6	105.4	101.7	89.8	92	95.5	Org:N Dep:R				
3 8:2 FTS	Disabled	2.147772	2.595179	2.226776	2.416743	2.251974	2.025063	2.220551	2.071763	2.028451	Avg:A Wt:C2	2.220475		RSD=8.5	
	Disabled	96.7	116.9	100.3	108.8	101.4	91.2	100	93.3	91.4	Org:N Dep:R				
D 58 d3-MeFOSAA	139	143	134	129	133	133	132	126	130	142	Avg:A Wt:C2	134		RSD=4.3	
	103.5	106.7	100.1	95.9	99	99.5	98.2	93.8	97.1	106.1	Org:N Dep:R				
6 N-MeFOSAA	0.707192	0.854259	0.915805	0.822346	0.813874	0.758649	0.842798	0.825585	0.775018	0.744141	Avg:A Wt:C2	0.805967		RSD=7.5	
	87.7	106	113.6	102	101	94.1	104.6	102.4	96.2	92.3	Org:N Dep:R				
9 PFDS	0.833442	0.854616	0.855904	0.801202	0.772285	0.778049	0.836763	0.909750	0.792896	0.797810	Avg:A Wt:C2	0.823272		RSD=5.2	
	101.2	103.8	104	97.3	93.8	94.5	101.6	110.5	96.3	96.9	Org:N Dep:R				
D 60 d5-EtFOSAA	124	129	129	118	127	127	123	110	108	112	Avg:A Wt:C2	121		RSD=6.7	
	102.9	106.9	107.1	97.9	104.9	105.1	101.8	91.5	89.4	92.4	Org:N Dep:R				
D 52 13C7_PFUdA	721	689	691	707	682	718	713	592	624	581	Avg:A Wt:C2	672		RSD=7.9	
	107.3	102.5	102.8	105.3	101.5	106.9	106.2	88.1	92.8	86.5	Org:N Dep:R				
25 PFUdA	0.841970	0.994078	0.842628	0.930254	0.921512	0.925977	0.829842	0.986382	0.845311	0.907831	Avg:A Wt:C2	0.902578		RSD=6.7	
	93.3	110.1	93.4	103.1	102.1	102.6	91.9	109.3	93.7	100.6	Org:N Dep:R				
5 N-EtFOSAA	1.249146	1.116395	1.096808	1.085210	0.937516	0.898596	0.992673	0.973960	1.000523	0.956066	Avg:A Wt:C2	1.030689		RSD=10.2	
	121.2	108.3	106.4	105.3	91	87.2	96.3	94.5	97.1	92.8	Org:N Dep:R				
D 61 d7-MeFOSE	110	105	109	102	104	105	106	97.5780	101	108	Avg:A Wt:C2	105		RSD=3.6	
	104.9	100.3	104.1	97	99.1	100.1	101.2	93.3	96.9	103.1	Org:N Dep:R				
D 57 d3-MeFOSA	57.9800	56.7780	54.7120	54.8460	48.1510	53.2970	58.2680	53.5350	54.9390	63.5570	Avg:A Wt:C2	55.6063		RSD=7.2	
	104.3	102.1	98.4	98.6	86.6	95.8	104.8	96.3	98.8	114.3	Org:N Dep:R				
32 MeFOSE	1.141383	1.038046	1.174349	1.188706	1.210876	1.170614	1.094582	1.162222	1.101485	1.041761	Avg:A Wt:C2	1.132402		RSD=5.3	
	100.8	91.7	103.7	105	106.9	103.4	96.7	102.6	97.3	92	Org:N Dep:R				
26 MeFOSA	1.388065	1.216492	0.952259	1.133975	1.217732	1.064047	1.020636	1.073666	1.092436	0.941408	Avg:A Wt:C2	1.110072		RSD=12.2	
	125	109.6	85.8	102.2	109.7	95.9	91.9	96.7	98.4	84.8	Org:N Dep:R				
31 11Cl-PF3OUDS	3.146560	3.187258	3.238127	3.252621	3.113031	3.166569	3.421501	3.372843	3.117384	3.231994	Avg:A Wt:C2	3.224789		RSD=3.2	
	97.6	98.8	100.4	100.9	96.5	98.2	106.1	104.6	96.7	100.2	Org:N Dep:R				
D 62 d9-EtFOSE	115	114	129	121	113	129	113	110	127	120	Avg:A Wt:C2	119		RSD=6.0	
	96.9	95.6	108.4	101.6	94.7	108.2	95.1	92.4	106.5	100.5	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
33 EtFOSE	1.303467	0.964237	0.908890	0.913559	0.975549	0.870728	0.921310	0.994862	0.863766	0.968147	Ln:A Wt:C2	0.904816	16.3519	R^2=0.993	
	107.9	88.5	91.4	97.4	106	95.3	101.5	109.8	95.3	106.9	Org:N Dep:R			RSE=7.9	
D 59 d5-EtFOSA	53.1750	49.8490	49.2600	49.2070	50.6490	54.6270	51.7340	47.4730	54.7700	49.4010	Avg:A Wt:C2	51.0145		RSD=4.9	
	104.2	97.7	96.6	96.5	99.3	107.1	101.4	93.1	107.4	96.8	Org:N Dep:R				
27 EtFOSA	1.371697	1.252984	1.236500	1.104599	1.120812	1.026827	1.119078	1.153755	0.983787	1.146418	Avg:A Wt:C2	1.151646		RSD=9.8	
	119.1	108.8	107.4	95.9	97.3	89.2	97.2	100.2	85.4	99.5	Org:N Dep:R				
D 38 13C2_PFDoA	690	739	676	704	688	694	666	603	650	651	Avg:A Wt:C2	676		RSD=5.4	
	102	109.3	100	104.1	101.7	102.7	98.6	89.2	96.1	96.3	Org:N Dep:R				
11 PFDoA	1.139519	1.070602	1.070129	1.034651	1.028668	1.046564	1.097777	1.159288	0.988726	0.986097	Avg:A Wt:C2	1.062202		RSD=5.4	
	107.3	100.8	100.7	97.4	96.8	98.5	103.3	109.1	93.1	92.8	Org:N Dep:R				
4 10:2 FTS	3.220590	2.799139	3.451333	2.456295	3.067632	3.331067	2.562684	3.138862	2.741874	2.704128	Avg:A Wt:C2	2.947360		RSD=11.5	
	109.3	95	117.1	83.3	104.1	113	86.9	106.5	93	91.7	Org:N Dep:R				
34 PFDOS	0.724617	0.630478	0.728814	0.708113	0.662808	0.680264	0.782075	0.778515	0.733280	0.769866	Avg:A Wt:C2	0.719883		RSD=7.0	
	100.7	87.6	101.2	98.4	92.1	94.5	108.6	108.1	101.9	106.9	Org:N Dep:R				
24 PFTrDA	0.986339	0.882399	0.910150	0.870227	0.937886	0.866320	0.935963	0.942751	0.880563	0.851964	Avg:A Wt:C2	0.906456		RSD=4.8	
	108.8	97.3	100.4	96	103.5	95.6	103.3	104	97.1	94	Org:N Dep:R				
D 42 13C2_PFTeDA	953	963	913	954	948	937	940	924	934	967	Avg:A Wt:C2	943		RSD=1.8	
	101	102.1	96.7	101.2	100.5	99.3	99.6	97.9	99.1	102.5	Org:N Dep:R				
23 PFTeDA	0.883198	0.862391	0.871268	0.818614	0.822684	0.808525	0.838477	0.804818	0.804174	0.731460	Avg:A Wt:C2	0.824561		RSD=5.3	
	107.1	104.6	105.7	99.3	99.8	98.1	101.7	97.6	97.5	88.7	Org:N Dep:R				
35 PFHxDA	0.809254	0.784921	0.720830	0.729766	0.695040	0.691613	0.703106	0.675082	0.641913	0.640323	Avg:A Wt:C2	0.709185		RSD=7.8	
	114.1	110.7	101.6	102.9	98	97.5	99.1	95.2	90.5	90.3	Org:N Dep:R				
D 40 13C2_PFHxDA	928	952	944	923	931	910	907	887	919	932	Avg:A Wt:C2	923		RSD=2.0	
	100.6	103.1	102.3	100	100.8	98.6	98.2	96.1	99.5	100.9	Org:N Dep:R				
36 PFODA	0.917445	0.876698	0.882181	0.892738	0.877045	0.878893	0.918030	0.894690	0.840647	0.843705	Avg:A Wt:C2	0.882207		RSD=2.9	
	104	99.4	100	101.2	99.4	99.6	104.1	101.4	95.3	95.6	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	082021013.d	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13
2	082021014.d	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51
3	082021015.d	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26
4	082021016.d	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05
5	082021017.d	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39
6	082021018.d	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14
7	082021019.d	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48
8	082021020.d	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29
9	082021021.d	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07
10	082021022.d	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	711817	750237	682698	710112	779629	695301	722568	665972	664793	701785	0.35
* 39 13C2_PFHxA	635476	661097	654818	592976	708776	594798	647550	611274	601331	613844	0.86
* 41 13C2_PFOA	612554	620732	601914	590213	635131	573295	573964	544064	546360	532997	3.47
* 43 13C3_PFBA	585791	589980	580253	549732	601915	558882	569173	530685	545012	544810	1.81
* 48 13C4_PFOS	142432	145418	148433	147337	152674	141674	157483	140620	136839	146571	0.71

13C2_PFDA ((|701785 - 711817| / (701785 + 711817)) / 2) * 100 = 0.35
13C2_PFHxA ((|613844 - 635476| / (613844 + 635476)) / 2) * 100 = 0.87
13C2_PFOA ((|532997 - 612554| / (532997 + 612554)) / 2) * 100 = 3.47
13C3_PFBA ((|544810 - 585791| / (544810 + 585791)) / 2) * 100 = 1.81
13C4_PFOS ((|146571 - 142432| / (146571 + 142432)) / 2) * 100 = 0.72

Pace Environmental Services, LLC
Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46
Method Lock: Unlocked Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	082021013.d	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13
2	082021014.d	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51
3	082021015.d	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26
4	082021016.d	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05
5	082021017.d	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39
6	082021018.d	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14
7	082021019.d	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48
8	082021020.d	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29
9	082021021.d	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07
10	082021022.d	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	617106	631637	619939	605639	612112	610466	587119	564178	584822	578242	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	34827	65794	130152	313148	653288	1236213	3219153	6101356	8729100	11698456	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	641739	645981	636336	641171	629666	638720	615520	571146	597215	595547	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	37298	72158	129700	337087	681082	1344258	3365607	6393414	9045341	12224455	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	188203	193452	185991	190114	193652	192763	185921	184892	181449	191379	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	13130	22536	40697	103248	222140	428637	1070949	2067873	3068986	4282258	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	1799	5102	8490	18470	42110	78061	198222	397050	612321	850663	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	106566	103530	109374	102808	105591	103421	105760	90095	109769	101193	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	685601	647916	628678	702501	649325	676258	679627	650218	626964	658569	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	635476	661097	654818	592976	708776	594798	647550	611274	601331	613844	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	40693	67890	128268	332895	731813	1292511	3126342	6457352	9255741	12481442	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	7437	14559	32718	77116	153029	299151	751218	1512306	2273641	3127331	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	23373	36620	64902	157926	346222	673221	1593376	3035092	4800030	6102749	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1235776	1231303	1176101	1188890	1220862	1179535	1199862	1100763	1146635	1129452	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	32491	63806	126503	310488	618730	1133157	2937550	5578232	8577524	10770688	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	523678	546775	553303	558542	573719	531781	556560	486423	512919	515988	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	134688	150973	150728	145666	146711	143590	140160	131665	140562	138655	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	6537	16231	30915	69268	144349	284958	677621	1347727	2111891	2790272	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	47699	100117	186072	485304	1048469	1869067	4880359	8558305	12642418	17705889	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	2488	5731	8804	19725	43099	86244	207283	384014	548414	764397	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	87523	95131	92673	95803	96908	89901	95227	76778	84679	88328	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	612554	620732	601914	590213	635131	573295	573964	544064	546360	532997	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	601453	582163	581331	622484	563802	567014	562582	528654	511773	505909	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	33858	65503	108017	278713	574098	1123021	2781307	5041221	7258570	10183303	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	8634	15138	29230	73779	142033	280561	709902	1286185	1886863	2558734	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	151947	152285	143772	149542	149352	145329	136973	127494	139567	139425	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	142432	145418	148433	147337	152674	141674	157483	140620	136839	146571	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	679257	714938	679649	667765	662557	656460	659112	619854	622392	642472	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	37788	76022	146223	346478	718216	1449947	3641124	6601252	9819541	12827321	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	8832	16469	30067	73729	147230	287856	756612	1415095	2190505	2975961	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	28164	49710	103053	237691	472733	955915	2516829	5038015	7048212	9812083	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	318153	293685	309571	299679	313093	292074	303889	302094	285379	285337	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	16136	31205	60581	149731	330597	651566	1545315	3059971	4591315	6374421	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	5788	14210	20177	64177	112465	232614	631067	1037239	1646014	2188171	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	108257	107287	104025	117042	110833	101902	111403	91945	99927	100773	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	41594	78121	139399	354543	690717	1361950	3616950	6513843	9149023	12756096	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	711817	750237	682698	710112	779629	695301	722568	665972	664793	701785	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	633790	665274	670047	635220	663112	668235	644402	568927	583061	605500	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
3 8:2 FTS	Disabled	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	Disabled	4415	10345	24968	51321	87937	216123	391187	594990	783311	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	693730	715064	671076	642771	663389	667120	658383	628356	650892	711283	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	4906	12217	24583	52858	107983	202444	554884	1037523	1513360	2117179	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	6104	12546	23725	57750	111190	218005	552439	1118121	1600175	2144604	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	620904	644888	646125	590881	633381	634337	614587	552410	539669	557940	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	720833	688618	690922	707166	681974	718387	713170	591970	623669	581276	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	30346	68454	116438	328922	628447	1330419	2959092	5839085	7907917	10554003	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	7756	14399	28347	64123	118761	228005	610084	1076050	1619854	2133709	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	109709	104899	108954	101502	103682	104751	105919	97578	101335	107812	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	57980	56778	54712	54846	48151	53297	58268	53535	54939	63557	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	6261	10889	25590	60328	125546	245246	579685	1134073	1674285	2246287	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	4024	6907	10420	31097	58635	113421	297352	574787	900260	1196662	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	22519	45722	87710	229096	437971	867006	2207357	4050762	6147735	8489696	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	115492	113945	129207	121008	112837	128976	113367	110085	126899	119758	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	7527	10987	23487	55274	110078	224606	522231	1095194	1644166	2318868	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	53175	49849	49260	49207	50649	54627	51734	47473	54770	49401	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3647	6246	12182	27177	56768	112185	289472	547722	808230	1132684	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	689905	739042	675993	703607	687538	694489	666493	602897	650076	651030	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	39308	79122	144680	363994	707248	1453655	3658303	6989310	9641203	12839569	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3361	5790	13844	27714	65551	130889	275213	556426	792371	1050772	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	5329	9294	20286	51252	95824	191397	518476	960798	1486002	2078076	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	34024	65213	123051	306149	644832	1203300	3119064	5683818	8586495	11093078	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	953240	963287	912555	954477	948336	937013	939910	923612	934427	966619	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	42095	83073	159016	390674	780181	1515197	3940465	7433394	11271630	14140854	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	37564	74715	136133	336777	647029	1258523	3186899	5987157	8844370	11931134	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	928361	951879	944279	922972	930923	909846	906520	886879	918543	931649	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	42586	83451	166605	411986	816461	1599314	4161065	7934814	11582563	15720730	

Report Date: 21-Aug-2021 12:36:25 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Level	Cal File	Cal Sample ID	Cal Date
1	082021013.d	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13
2	082021014.d	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51
3	082021015.d	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26
4	082021016.d	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05
5	082021017.d	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39
6	082021018.d	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14
7	082021019.d	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48
8	082021020.d	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29
9	082021021.d	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07
10	082021022.d	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.712	1.711	1.711	1.710	1.711	1.709	1.710	1.712	1.711	1.711	1.710	0.056
8 PFBA	1.712	1.711	1.711	1.710	1.711	1.715	1.717	1.712	1.711	1.711	1.712	0.120
D 50 13C5_PFPeA	2.077	2.077	2.077	2.076	2.077	2.083	2.087	2.077	2.088	2.088	2.080	0.230
21 PFPeA	2.077	2.077	2.077	2.076	2.088	2.083	2.087	2.088	2.088	2.088	2.082	0.247
D 44 13C3_PFBS	2.130	2.130	2.130	2.140	2.141	2.136	2.140	2.141	2.141	2.141	2.136	0.223
7 PFBS	2.141	2.130	2.130	2.140	2.141	2.136	2.140	2.141	2.141	2.141	2.137	0.203
1 4:2 FTS	2.407	2.406	2.407	2.406	2.407	2.405	2.406	2.407	2.407	2.407	2.406	0.020
D 63 13C2_4:2 FTS_2	2.407	2.406	2.407	2.406	2.407	2.405	2.406	2.407	2.407	2.407	2.406	0.020
D 49 13C5_PFHxA	2.442	2.442	2.442	2.441	2.442	2.441	2.441	2.442	2.442	2.442	2.442	0.021
* 39 13C2_PFHxA	2.442	2.442	2.442	2.441	2.442	2.441	2.450	2.442	2.442	2.451	2.443	0.155
15 PFHxA	2.442	2.442	2.442	2.441	2.442	2.441	2.450	2.442	2.451	2.451	2.444	0.181
22 PFPeS	2.478	2.477	2.478	2.477	2.478	2.477	2.477	2.478	2.478	2.478	2.477	0.030
28 GenX	2.558	2.558	2.558	2.557	2.558	2.566	2.557	2.558	2.567	2.567	2.560	0.168
D 66 13C3_GenX	2.558	2.558	2.558	2.557	2.558	2.557	2.557	2.558	2.558	2.558	2.558	0.028
13 PFHpA	2.813	2.818	2.818	2.817	2.818	2.817	2.817	2.818	2.818	2.818	2.817	0.063
D 47 13C4_PFHpA	2.813	2.818	2.818	2.817	2.818	2.817	2.817	2.818	2.818	2.818	2.817	0.063
D 45 13C3_PFHxS	2.831	2.827	2.827	2.835	2.836	2.835	2.835	2.827	2.836	2.836	2.832	0.149
14 PFHxS	2.831	2.827	2.836	2.826	2.836	2.835	2.835	2.836	2.836	2.836	2.833	0.147
29 ADONA	2.858	2.854	2.854	2.853	2.864	2.853	2.862	2.864	2.863	2.864	2.859	0.167
2 6:2 FTS	3.169	3.172	3.181	3.178	3.174	3.178	3.178	3.181	3.181	3.181	3.177	0.127
D 64 13C2_6:2 FTS_2	3.169	3.179	3.174	3.178	3.181	3.178	3.178	3.181	3.181	3.174	3.177	0.111
* 41 13C2_PFOA	3.196	3.199	3.201	3.205	3.201	3.205	3.205	3.208	3.207	3.208	3.203	0.124
D 53 13C8_PFOA	3.196	3.199	3.201	3.205	3.201	3.205	3.205	3.201	3.207	3.208	3.202	0.117
20 PFOA	3.203	3.205	3.201	3.205	3.201	3.205	3.205	3.208	3.207	3.208	3.204	0.083
12 PFHpS	3.196	3.205	3.207	3.212	3.208	3.205	3.211	3.208	3.214	3.214	3.208	0.168
D 54 13C8_PFOS	3.571	3.575	3.577	3.582	3.577	3.574	3.582	3.577	3.585	3.585	3.578	0.140
* 48 13C4_PFOS	3.579	3.575	3.577	3.582	3.577	3.582	3.582	3.585	3.585	3.585	3.580	0.109
D 56 13C9_PFNA	3.579	3.583	3.585	3.582	3.585	3.582	3.590	3.585	3.593	3.585	3.584	0.115
17 PFNA	3.579	3.583	3.585	3.582	3.585	3.590	3.590	3.585	3.593	3.593	3.586	0.137
18 PFOS	3.571	3.575	3.577	3.582	3.585	3.582	3.582	3.585	3.585	3.585	3.580	0.142
30 9Cl-PF3ONS	3.784	3.787	3.789	3.787	3.790	3.787	3.795	3.790	3.797	3.799	3.790	0.125
D 55 13C8_PFOSA	3.864	3.868	3.861	3.868	3.863	3.868	3.868	3.871	3.870	3.871	3.867	0.086
19 PFOSA	3.856	3.868	3.861	3.868	3.863	3.868	3.868	3.871	3.870	3.871	3.866	0.121

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
16 PFNS	3.922	3.917	3.927	3.925	3.920	3.925	3.934	3.928	3.927	3.929	3.925	0.119
D 65 13C2_8:2 FTS_2	3.930	3.926	3.927	3.934	3.928	3.934	3.934	3.928	3.936	3.937	3.931	0.098
10 PFDA	3.930	3.934	3.936	3.934	3.937	3.942	3.942	3.937	3.944	3.946	3.938	0.128
* 37 13C2_PFDA	3.930	3.934	3.936	3.934	3.937	3.942	3.942	3.937	3.944	3.946	3.938	0.128
D 51 13C6_PFDA	3.930	3.934	3.936	3.934	3.937	3.934	3.942	3.937	3.944	3.946	3.937	0.129
3 8:2 FTS	Disabled	3.926	3.927	3.934	3.937	3.934	3.934	3.928	3.936	3.937	3.932	0.107
D 58 d3-MeFOSAA	4.091	4.093	4.097	4.102	4.098	4.093	4.102	4.098	4.097	4.098	4.096	0.088
6 N-MeFOSAA	4.091	4.085	4.097	4.102	4.107	4.102	4.102	4.107	4.106	4.107	4.100	0.185
9 PFDS	4.239	4.232	4.225	4.231	4.237	4.231	4.241	4.237	4.236	4.237	4.234	0.109
D 60 d5-EtFOSAA	4.249	4.252	4.256	4.252	4.257	4.251	4.262	4.257	4.256	4.258	4.254	0.091
D 52 13C7_PFUdA	4.249	4.252	4.256	4.252	4.257	4.251	4.251	4.257	4.256	4.258	4.253	0.074
25 PFUdA	4.249	4.252	4.246	4.252	4.257	4.251	4.251	4.257	4.256	4.258	4.252	0.094
5 N-EtFOSAA	4.259	4.252	4.256	4.262	4.267	4.262	4.262	4.267	4.266	4.268	4.261	0.130
D 61 d7-MeFOSE	4.289	4.292	4.286	4.292	4.287	4.292	4.292	4.297	4.296	4.298	4.292	0.095
D 57 d3-MeFOSA	4.309	4.313	4.306	4.312	4.308	4.312	4.312	4.318	4.317	4.308	4.311	0.084
32 MeFOSE	4.299	4.303	4.296	4.302	4.308	4.302	4.302	4.297	4.307	4.308	4.302	0.095
26 MeFOSA	4.309	4.313	4.317	4.322	4.318	4.312	4.322	4.318	4.317	4.318	4.316	0.097
31 11Cl-PF3OUDS	4.392	4.393	4.389	4.393	4.398	4.393	4.393	4.398	4.397	4.398	4.394	0.064
D 62 d9-EtFOSE	4.458	4.459	4.453	4.459	4.454	4.459	4.459	4.454	4.462	4.455	4.457	0.066
33 EtFOSE	4.467	4.468	4.471	4.468	4.472	4.468	4.468	4.472	4.471	4.473	4.469	0.056
D 59 d5-EtFOSA	4.476	4.477	4.480	4.477	4.481	4.477	4.477	4.481	4.480	4.482	4.478	0.056
27 EtFOSA	4.485	4.486	4.489	4.486	4.481	4.486	4.486	4.490	4.489	4.491	4.486	0.067
D 38 13C2_PFDoA	4.521	4.522	4.525	4.531	4.526	4.531	4.531	4.535	4.534	4.527	4.528	0.111
11 PFDoA	4.521	4.522	4.525	4.531	4.526	4.531	4.531	4.526	4.534	4.536	4.528	0.111
4 10:2 FTS	4.539	4.539	4.543	4.540	4.535	4.540	4.540	4.544	4.543	4.545	4.540	0.063
34 PFDOS	4.745	4.739	4.741	4.745	4.742	4.745	4.745	4.748	4.747	4.749	4.744	0.071
24 PFTrDA	4.772	4.766	4.768	4.772	4.769	4.772	4.772	4.775	4.774	4.776	4.771	0.071
D 42 13C2_PFTeDA	4.990	4.990	4.991	4.990	4.992	4.996	4.996	4.998	4.997	4.998	4.993	0.070
23 PFTeDA	4.990	4.990	4.991	4.990	4.998	4.996	4.996	4.998	4.997	4.998	4.994	0.075
35 PFHxDA	5.385	5.385	5.395	5.394	5.390	5.394	5.394	5.399	5.395	5.399	5.393	0.086
D 40 13C2_PFHxDA	5.385	5.385	5.387	5.394	5.390	5.394	5.394	5.399	5.395	5.399	5.392	0.092
36 PFODA	5.765	5.772	5.774	5.772	5.775	5.772	5.779	5.775	5.780	5.782	5.774	0.090

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021013.d
Injection Date: 20-Aug-2021 17:50:13 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 1 Auto Sampler: 1
Sample Info: F.L. ICAL 50_SVLC-1596 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-1 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.711	4	617106	20	>100:1			1000.00	1026.58	100.8	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.711	4/0	34827	19	31:1			50.000	53.653		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	3	641739	16	>100:1			1000.00	1032.89	101.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.088	3/0	37298	15	40:1			50.000	54.151		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.141	4	188203	14	>100:1			1000.00	996.94	97.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	4/0	13130	21	>100:1	Target = 3.41		44.200	53.552		
298.9 > 99	44	2.130	2.141		3573	18	27:1	3.67 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	5/1	7437	16	>100:1	Target = 2.92		46.900	45.883		
349 > 99	44	2.469	2.478		2524	12	39:1	2.94 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	5	106566	16	>100:1			5000.00	5132.71	100.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	5/0	1799	21	30:1	Target = 1.58		46.700	39.798		
327 > 81	63	2.416	2.407		2776	16	13:1	0.64 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	5	685601	17	>100:1			1000.00	1037.90	105.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	5/0	40693	17	62:1	Target = 18.69		50.000	58.590		
313 > 119	49	2.442	2.442		1939	15	17:1	20.98 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	5	1235776	17	>100:1			5000.00	5232.27	101.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	5/0	23373	18	53:1	Target = 0.78		100.00	105.32		
285 > 185	66	2.558	2.558		28663	18	66:1	0.81 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.813	2.818	5	523678	17	>100:1			1000.00	977.07	91.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.813	2.818	5/0	32491	20	55:1	Target = 3.75		50.000	55.557		
363 > 169	47	2.813	2.818		8302	29	90:1	3.91 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.831	2.836	6	134688	17	>100:1			1000.00	946.24	91.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.831	2.836	6/0	6537	17	47:1	Target = 2.79		45.500	44.180		
399 > 99	45	2.840	2.836		3006	30	18:1	2.17 (1.39-4.19)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.858	2.864	6/0	47699	19	>100:1	Target = 3.21		47.100	50.508		
377 > 85	45	2.858	2.864		14009	16	91:1	3.40 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.196	3.208	6/0	8634	20	>100:1	Target = 3.03		47.600	60.905		
449 > 99	45	3.203	3.208		2096	22	17:1	4.11 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.169	3.181	6	87523	20	>100:1			5000.00	4846.50	90.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.169	3.174	6/0	2488	22	34:1	Target = 1.94		47.400	56.353		
427 > 81	64	3.169	3.174		1043	16	15:1	2.38 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.196	3.201	6	601453	22	>100:1			1000.00	1068.84	106.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.203	3.201	7/1	33858	18	34:1	Target = 2.91		50.000	56.415		
413 > 169	53	3.203	3.201		10981	17	75:1	3.08 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.571	3.577	7	151947	18				1000.00	1058.36	101.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.571	3.585	0/-7	8832	31	26:1	Target = 3.38	0.29	46.400	50.983		M
499 > 99	54	3.587	3.585		2711	28	22:1	3.25 (1.69-5.07)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.784	3.790	7/0	28164	20	>100:1			46.600	49.784		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.922	3.920	7/0	5788	19	63:1	Target = 2.80		48.000	45.067		
549 > 99	54	3.930	3.920		2204	22	5.6:1	2.62 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.239	4.237	7/0	6104	21	34:1	Target = 3.15		48.200	48.795		
599 > 99	54	4.228	4.237		1369	18	15:1	4.45 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.392	4.398	7/0	22519	23	>100:1			47.100	45.957		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.745	4.742	4/-3	5329	14	>100:1	Target = 3.01		48.400	48.718		
699 > 99	54	4.745	4.742		2083	23	25:1	2.55 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.579	3.585	7	679257	19	>100:1			1000.00	1028.48	102.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.579	3.585	7/0	37788	16	63:1	Target = 6.48		50.000	52.003		
463 > 169	56	3.587	3.585		6483	16	27:1	5.82 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.864	3.863	6	318153	18	>100:1			1000.00	1059.47	101.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.863	6/0	16136	15	>100:1	Target = 32.22		50.000	48.555		
498>478	55	3.848	3.863		352	5	7.6:1	45.84 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.930	3.928	7	108257	18	>100:1			5000.00	5138.49	97.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.939	3.937	1/-6	1312	9		Target = 1.96		47.900	27.290		M
527 > 81	65	3.905	3.937		878	18	11:1	1.49 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.539	4.535	7/0	3361	15	50:1	Target = 3.34		48.200	52.668		
627 > 80	65	4.521	4.535		861	14	11:1	3.90 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.930	3.937	7	633790	18	>100:1			1000.00	1000.05	95.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.930	3.937	7/0	41594	18	53:1	Target = 13.93		50.000	59.279		
513 > 169	51	3.922	3.937		2684	14	13:1	15.49 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.091	4.098	7	693730	18	>100:1			5000.00	5175.50	104.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.091	4.107	0/-7	4906	29	45:1	Target = 1.31	0.22	50.000	43.872		M
570 > 483	58	4.091	4.107		3427	26	25:1	1.43 (0.65-1.97)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.249	4.257	6	720833	16				1000.00	1072.99	105.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.249	4.257	6/0	30346	16	68:1	Target = 14.01		50.000	46.643		
563 > 169	52	4.239	4.257		2047	20	15:1	14.82 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.249	4.257	6	620904	17	>100:1			5000.00	5144.09	98	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.259	4.267	0/-6	7756	26		Target = 1.75		50.000	60.598		M
584 > 526	60	4.249	4.267		3644	24	13:1	2.12 (0.87-2.62)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.289	4.287	6	109709	14	>100:1			1000.00	1048.70	105.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.299	4.308	6/0	6261	12	29:1			50.000	50.397		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.309	4.308	6	57980	14	>100:1			1000.00	1042.69	120.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.309	4.318	6/0	4024	18	20:1	Target = 1.04		50.000	62.521		
512 > 219	57	4.320	4.318		3001	16	22:1	1.34 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.458	4.454	6	115492	17	>100:1			1000.00	969.24	102.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.467	4.472	6/0	7527	13	41:1			50.000	53.957		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.476	4.481	6	53175	14	>100:1			1000.00	1042.35	105	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.485	4.481	6/0	3647	12	35:1	Target = 1.05		50.000	59.554		
526 > 219	59	4.485	4.481		2399	19	13:1	1.52 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.521	4.526	6	689905	18	>100:1			1000.00	1020.41	100.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.521	4.526	6/0	39308	17	25:1	Target = 10.52		50.000	53.639		
613 > 169	38	4.521	4.526		3365	14	43:1	11.68 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.772	4.769	6/0	34024	19	72:1	Target = 7.51		50.000	54.406		
663 > 169	38	4.772	4.769		5087	28	71:1	6.68 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.990	4.992	5	953240	19	>100:1			1000.00	1010.49	100.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.990	4.998	5/0	42095	18	21:1	Target = 11.12		50.000	53.556		
713 > 169	42	4.984	4.998		3844	18	44:1	10.95 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.385	5.390	4	928361	18	>100:1			1000.00	1005.61	99.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.385	5.390	4/0	37564	17	>100:1	Target = 10.69		50.000	57.055		
813 > 269	40	5.385	5.390		3528	17	43:1	10.64 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.765	5.775	5/1	42586	22	>100:1	Target = 13.29		50.000	51.997		
913 > 319	40	5.765	5.775		3594	21	44:1	11.84 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.930	3.937	7	711817	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	5	635476	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.196	3.201	6	612554	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	4	585791	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.579	3.577	7	142432	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021014.d
Injection Date: 20-Aug-2021 18:00:51 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 2 Auto Sampler: 2
Sample Info: F.L. ICAL 100_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	631637	21	>100:1			1000.00	1050.76	103.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	65794	18	62:1			100.00	99.028		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	0	645981	15	>100:1			1000.00	1039.72	102.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.088	0/0	72158	14	84:1			100.00	104.07		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.141	0	193452	14	>100:1			1000.00	1024.74	99.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.141	0/0	22536	14	>100:1	Target = 3.41		88.400	89.422		
298.9 > 99	44	2.130	2.141		7273	19	57:1	3.09 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.478	0/0	14559	23	>100:1	Target = 2.92		93.800	87.385		
349 > 99	44	2.468	2.478		4967	21	28:1	2.93 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.407	0	103530	17	>100:1			5000.00	4986.48	98	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.407	0/0	5102	13	72:1	Target = 1.58		93.400	116.18		
327 > 81	63	2.397	2.407		3639	16	13:1	1.40 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	0	647916	17	>100:1			1000.00	980.85	99.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	0/0	67890	17	>100:1	Target = 18.69		100.00	103.43		
313 > 119	49	2.442	2.442		4372	20	44:1	15.52 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1231303	18	>100:1			5000.00	5213.33	100.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	0/0	36620	16	>100:1	Target = 0.78		200.00	185.74		
285 > 185	66	2.558	2.558		50083	18	>100:1	0.73 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	546775	16	>100:1			1000.00	1020.16	95.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	63806	18	62:1	Target = 3.75		100.00	104.49		
363 > 169	47	2.818	2.818		16318	14	91:1	3.91 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	150973	17	>100:1			1000.00	1060.65	102.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.827	2.836	0/0	16231	25	>100:1	Target = 2.79	0.15	91.000	97.864		
399 > 99	45	2.827	2.836		6069	30	66:1	2.67 (1.39-4.19)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.854	2.864	0/0	100117	18	>100:1	Target = 3.21		94.200	94.577		
377 > 85	45	2.854	2.864		29384	20	>100:1	3.40 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.205	3.208	1/1	15138	27	>100:1	Target = 3.03		95.200	95.267		
449 > 99	45	3.205	3.208		5691	24	30:1	2.65 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.179	3.181	1	95131	22	>100:1			5000.00	5267.78	98.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.172	3.174	1/0	5731	18	84:1	Target = 1.94		94.800	119.43		
427 > 81	64	3.179	3.174		2554	18	43:1	2.24 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.199	3.201	1	582163	22	>100:1			1000.00	1034.56	103.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.201	1/0	65503	20	68:1	Target = 2.91		100.00	112.76		
413 > 169	53	3.199	3.201		18382	19	66:1	3.56 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.575	3.577	1	152285	18	>100:1			1000.00	1060.71	102	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.575	3.585	0/-1	16469	33	98:1	Target = 3.38		92.800	94.857		M
499 > 99	54	3.575	3.585		4617	31	27:1	3.56 (1.69-5.07)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.790	1/0	49710	22	>100:1			93.200	87.674		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.917	3.920	0/-1	14210	23	79:1	Target = 2.80		96.000	110.40		
549 > 99	54	3.926	3.920		3885	22	44:1	3.65 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.232	4.237	0/-1	12546	20	91:1	Target = 3.15		96.400	100.07		
599 > 99	54	4.221	4.237		2795	18	27:1	4.48 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.393	4.398	1/0	45722	16	>100:1			94.200	93.104		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.739	4.742	0/-1	9294	15	>100:1	Target = 3.01		96.800	84.778		
699 > 99	54	4.739	4.742		3116	28	68:1	2.98 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.583	3.585	1	714938	20	>100:1			1000.00	1082.51	107.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.583	3.585	1/0	76022	17	>100:1	Target = 6.48		100.00	99.399		
463 > 169	56	3.591	3.585		10640	22	75:1	7.14 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.863	1	293685	25	>100:1			1000.00	977.99	93.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.868	3.863	1/0	31205	18	>100:1	Target = 32.22		100.00	101.72		
498>478	55	3.876	3.863		1162	18	14:1	26.85 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.926	3.928	0	107287	16	>100:1			5000.00	5092.44	96.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.926	3.937	7/7	4415	14	22:1	Target = 1.96		95.800	92.663		
527 > 81	65	3.934	3.937		3279	16	23:1	1.34 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.539	4.535	1/1	5790	12	68:1	Target = 3.34		96.400	91.552		
627 > 80	65	4.531	4.535		1378	18	8.6:1	4.20 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.937	1	665274	18	>100:1			1000.00	1049.73	100.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.934	3.937	1/0	78121	16	90:1	Target = 13.93		100.00	106.07		
513 > 169	51	3.934	3.937		4794	13	25:1	16.29 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.098	1	715064	17	>100:1			5000.00	5334.66	107.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.085	4.107	-1/-2	12217	29		Target = 1.31	0.14	100.00	105.99		M
570 > 483	58	4.093	4.107		12002	33	71:1	1.01 (0.65-1.97)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.252	4.257	1	688618	16	>100:1			1000.00	1025.04	101	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.252	4.257	1/0	68454	13	>100:1	Target = 14.01		100.00	110.14		
563 > 169	52	4.242	4.257		4339	20	36:1	15.77 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.252	4.257	1	644888	16	>100:1			5000.00	5342.79	101.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.252	4.267	0/-1	14399	37		Target = 1.75	0.08	100.00	108.32		
584 > 526	60	4.262	4.267		6863	35	42:1	2.09 (0.87-2.62)	0.09				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.287	1	104899	16	>100:1			1000.00	1002.72	101.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.303	4.308	1/0	10889	15	54:1			100.00	91.668		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.313	4.308	1	56778	17	>100:1			1000.00	1021.07	117.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.313	4.318	1/0	6907	14	34:1	Target = 1.04		100.00	109.59		
512 > 219	57	4.313	4.318		5897	17	38:1	1.17 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.454	1	113945	14	>100:1			1000.00	956.26	101	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.468	4.472	1/0	10987	13	83:1			100.00	88.495		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.481	1	49849	15	>100:1			1000.00	977.15	98.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.486	4.481	1/0	6246	15	21:1	Target = 1.05		100.00	108.80		
526 > 219	59	4.486	4.481		6806	19	38:1	0.91 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.522	4.526	1	739042	17	>100:1			1000.00	1093.08	107.5	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.522	4.526	1/0	79122	16	33:1	Target = 10.52		100.00	100.79		
613 > 169	38	4.522	4.526		8678	12	52:1	9.11 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.766	4.769	0/-1	65213	17	>100:1	Target = 7.51		100.00	97.346		
663 > 169	38	4.766	4.769		9014	19	>100:1	7.23 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.990	4.992	1	963287	20	>100:1			1000.00	1021.14	101.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.990	4.998	1/0	83073	19	15:1	Target = 11.12		100.00	104.59		
713 > 169	42	4.990	4.998		7257	22	78:1	11.44 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.385	5.390	1	951879	17	>100:1			1000.00	1031.08	102.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.385	5.390	1/0	74715	17	16:1	Target = 10.69		100.00	110.68		
813 > 269	40	5.385	5.390		7454	15	70:1	10.02 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.772	5.775	1/0	83451	21	>100:1	Target = 13.29		100.00	99.375		
913 > 319	40	5.765	5.775		5763	16	>100:1	14.48 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.934	3.937	1	750237	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	661097	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.199	3.201	1	620732	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	589980	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.575	3.577	0	145418	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021015.d
Injection Date: 20-Aug-2021 18:11:26 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 3 Auto Sampler: 3
Sample Info: F.L. ICAL 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	1	619939	21	>100:1			1000.00	1031.30	101.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	1/0	130152	20	>100:1			200.00	199.59		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	636336	16	>100:1			1000.00	1024.19	101.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.077	2.088	1/0	129700	13	>100:1			200.00	189.90		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.141	1	185991	14	>100:1			1000.00	985.22	96	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.130	2.141	0/-1	40697	16	>100:1	Target = 3.41		176.80	167.96		
298.9 > 99	44	2.130	2.141		12689	13	>100:1	3.20 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	32718	18	>100:1	Target = 2.92		187.60	204.26		
349 > 99	44	2.478	2.478		9822	14	>100:1	3.33 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	109374	17	>100:1			5000.00	5267.95	103.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	8490	17		Target = 1.58		186.80	183.00		
327 > 81	63	2.407	2.407		5842	18	34:1	1.45 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	628678	16	>100:1			1000.00	951.73	96.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	1/0	128268	17	>100:1	Target = 18.69		200.00	201.40		
313 > 119	49	2.442	2.442		6703	20	45:1	19.13 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	1	1176101	17	>100:1			5000.00	4979.61	96.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	1/0	64902	19	>100:1	Target = 0.78		400.00	374.73		
285 > 185	66	2.558	2.558		85039	17	>100:1	0.76 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	553303	18	>100:1			1000.00	1032.34	96.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	126503	18	>100:1	Target = 3.75		200.00	204.73		
363 > 169	47	2.818	2.818		30859	17	>100:1	4.09 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	150728	18	>100:1			1000.00	1058.93	102.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/1	30915	30	>100:1	Target = 2.79	0.20	182.00	186.70		
399 > 99	45	2.836	2.836		12999	27	56:1	2.37 (1.39-4.19)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.854	2.864	0/0	186072	17	>100:1	Target = 3.21		188.40	176.06		
377 > 85	45	2.854	2.864		59331	24	>100:1	3.13 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.207	3.208	1/1	29230	18	>100:1	Target = 3.03		190.40	184.25		
449 > 99	45	3.201	3.208		10368	18	59:1	2.81 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.174	3.181	1	92673	19	>100:1			5000.00	5131.67	95.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.174	1/0	8804	23	>100:1	Target = 1.94		189.60	188.33		
427 > 81	64	3.167	3.174		4732	26	28:1	1.86 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.201	3.201	1	581331	22	>100:1			1000.00	1033.08	103.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.201	3.201	0/-1	108017	19	82:1	Target = 2.91		200.00	186.21		
413 > 169	53	3.201	3.201		40167	19	>100:1	2.68 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.577	3.577	1	143772	18	>100:1			1000.00	1001.42	96.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.577	3.585	0/-1	30067	36	>100:1	Target = 3.38	0.15	185.60	183.43		M
499 > 99	54	3.577	3.585		9435	31	70:1	3.18 (1.69-5.07)	0.12				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.789	3.790	1/0	103053	20	>100:1			186.40	192.52		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.927	3.920	1/0	20177	16	>100:1	Target = 2.80		192.00	166.04		
549 > 99	54	3.927	3.920		9115	22	82:1	2.21 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.225	4.237	0/-1	23725	15	>100:1	Target = 3.15		192.80	200.44		
599 > 99	54	4.236	4.237		8013	21	76:1	2.96 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.389	4.398	0/-1	87710	18	>100:1			188.40	189.18		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.741	4.742	0/-1	20286	19	>100:1	Target = 3.01		193.60	196.00		
699 > 99	54	4.741	4.742		6185	18	36:1	3.27 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.585	1	679649	18	>100:1			1000.00	1029.08	102.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.585	3.585	1/0	146223	17	>100:1	Target = 6.48		200.00	201.11		
463 > 169	56	3.585	3.585		22552	16	>100:1	6.48 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.861	3.863	0	309571	16				1000.00	1030.89	98.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.861	3.863	0/0	60581	19	>100:1	Target = 32.22		200.00	187.35		
498>478	55	3.870	3.863		2321	20	28:1	26.10 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.927	3.928	0	104025	17	>100:1			5000.00	4937.61	93.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.927	3.937	1/1	10345	18	61:1	Target = 1.96		191.60	223.93		
527 > 81	65	3.944	3.937		3890	23	12:1	2.65 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.543	4.535	1/1	13844	18	>100:1	Target = 3.34		192.80	225.77		
627 > 80	65	4.525	4.535		4603	20	20:1	3.00 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.936	3.937	1	670047	18	>100:1			1000.00	1057.26	101	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.936	3.937	1/0	139399	18	>100:1	Target = 13.93		200.00	187.92		
513 > 169	51	3.936	3.937		10942	17	48:1	12.73 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.097	4.098	1	671076	18	>100:1			5000.00	5006.49	101.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.097	4.107	0/-1	24583	29	>100:1	Target = 1.31	0.12	200.00	227.26		M
570 > 483	58	4.097	4.107		15833	26	43:1	1.55 (0.65-1.97)	0.22				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.256	4.257	1	690922	15	>100:1			1000.00	1028.47	101.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.246	4.257	0/-1	116438	21	>100:1	Target = 14.01		200.00	186.72		
563 > 169	52	4.256	4.257		9623	19	59:1	12.09 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.256	4.257	1	646125	17	>100:1			5000.00	5353.04	102	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.256	4.267	0/-1	28347	28		Target = 1.75		200.00	212.83		M
584 > 526	60	4.256	4.267		14301	31	54:1	1.98 (0.87-2.62)	0.09				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.286	4.287	0	108954	16	>100:1			1000.00	1041.48	105.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.296	4.308	0/0	25590	19				200.00	207.41		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.306	4.308	0	54712	22	>100:1			1000.00	983.92	113.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.317	4.318	1/1	10420	18	42:1	Target = 1.04		200.00	171.57		
512 > 219	57	4.317	4.318		11962	12	51:1	0.87 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.453	4.454	0	129207	17	>100:1			1000.00	1084.34	114.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.471	4.472	1/1	23487	16	>100:1			200.00	182.83		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.480	4.481	1	49260	19	>100:1			1000.00	965.61	97.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.489	4.481	1/0	12182	19	67:1	Target = 1.05		200.00	214.74		
526 > 219	59	4.480	4.481		11414	14	73:1	1.06 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.525	4.526	1	675993	18	>100:1			1000.00	999.83	98.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.525	4.526	1/0	144680	14	66:1	Target = 10.52		200.00	201.49		
613 > 169	38	4.525	4.526		14038	13	>100:1	10.30 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.768	4.769	0/-1	123051	21	>100:1	Target = 7.51		200.00	200.81		
663 > 169	38	4.768	4.769		18064	21	99:1	6.81 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.991	4.992	1	912555	21	>100:1			1000.00	967.36	96.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.991	4.998	1/0	159016	20	23:1	Target = 11.12		200.00	211.33		
713 > 169	42	4.991	4.998		13824	20	>100:1	11.50 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.387	5.390	1	944279	19	>100:1			1000.00	1022.85	101.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.395	5.390	1/0	136133	18	30:1	Target = 10.69		200.00	203.28		
813 > 269	40	5.395	5.390		12584	18	>100:1	10.81 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.774	5.775	1/0	166605	23	15:1	Target = 13.29		200.00	199.99		
913 > 319	40	5.767	5.775		12341	23	>100:1	13.50 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.936	3.937	1	682698	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	1	654818	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.201	3.201	1	601914	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	580253	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.577	3.577	1	148433	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021016.d
Injection Date: 20-Aug-2021 18:22:05 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 4 Auto Sampler: 4
Sample Info: F.L. ICAL 500_SVLC-1599 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-4 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.710	1.711	0	605639	21	>100:1			1000.00	1007.51	98.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.710	1.711	0/0	313148	20	>100:1			500.00	491.56		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.076	2.077	0	641171	15	>100:1			1000.00	1031.98	101.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.076	2.088	0/0	337087	15	>100:1			500.00	489.83		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.141	1	190114	14	>100:1			1000.00	1007.06	98.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.141	1/0	103248	14	>100:1	Target = 3.41		442.00	416.88		
298.9 > 99	44	2.140	2.141		32454	14	>100:1	3.18 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.478	0/-1	77116	16	>100:1	Target = 2.92		469.00	470.99		
349 > 99	44	2.477	2.478		26216	17	>100:1	2.94 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.407	0	102808	17	>100:1			5000.00	4951.71	97.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.407	0/0	18470	16	>100:1	Target = 1.58		467.00	423.54		
327 > 81	63	2.406	2.407		12266	21	78:1	1.50 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.442	0	702501	18	>100:1			1000.00	1063.48	108.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.442	0/0	332895	18	>100:1	Target = 18.69		500.00	467.77		
313 > 119	49	2.441	2.442		17163	17	83:1	19.39 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.557	2.558	0	1188890	17	>100:1			5000.00	5033.75	97.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.557	2.558	0/0	157926	19	>100:1	Target = 0.78		1000.00	951.52		
285 > 185	66	2.557	2.558		212542	18	>100:1	0.74 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.817	2.818	1	558542	17	>100:1			1000.00	1042.12	97.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.817	2.818	1/0	310488	18	>100:1	Target = 3.75		500.00	497.77		
363 > 169	47	2.817	2.818		85493	16	>100:1	3.63 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.836	1	145666	17				1000.00	1023.37	99.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.826	2.836	0/-1	69268	26		Target = 2.79	0.19	455.00	432.86		
399 > 99	45	2.835	2.836		24997	26	>100:1	2.77 (1.39-4.19)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.853	2.864	0/-1	485304	18	>100:1	Target = 3.21		471.00	475.15		
377 > 85	45	2.863	2.864		149028	19	>100:1	3.25 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.212	3.208	1/0	73779	20	>100:1	Target = 3.03		476.00	481.22		
449 > 99	45	3.205	3.208		25359	23	>100:1	2.90 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.181	1	95803	21	>100:1			5000.00	5304.99	98.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.178	3.174	1/0	19725	24	>100:1	Target = 1.94		474.00	408.16		
427 > 81	64	3.172	3.174		11001	20	57:1	1.79 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.201	1	622484	21	>100:1			1000.00	1106.21	110.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.201	1/0	278713	18	>100:1	Target = 2.91		500.00	448.71		
413 > 169	53	3.205	3.201		104473	18	>100:1	2.66 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.577	1	149542	23	>100:1			1000.00	1041.61	100.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.585	1/0	73729	36	>100:1	Target = 3.38	0.24	464.00	432.45		
499 > 99	54	3.582	3.585		24294	36	>100:1	3.03 (1.69-5.07)	0.12				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.790	1/0	237691	19	>100:1			466.00	426.91		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.925	3.920	1/0	64177	23	>100:1	Target = 2.80		480.00	507.74		
549 > 99	54	3.925	3.920		22334	15	>100:1	2.87 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.231	4.237	1/0	57750	16	>100:1	Target = 3.15		482.00	469.08		
599 > 99	54	4.231	4.237		16767	13	59:1	3.44 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.393	4.398	1/0	229096	20	>100:1			471.00	475.07		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.745	4.742	1/0	51252	18	>100:1	Target = 3.01		484.00	476.09		
699 > 99	54	4.745	4.742		15788	18	>100:1	3.24 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.585	1	667765	19	>100:1			1000.00	1011.08	100.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.582	3.585	1/0	346478	19	>100:1	Target = 6.48		500.00	485.02		
463 > 169	56	3.582	3.585		51673	19	>100:1	6.70 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.863	1	299679	18	>100:1			1000.00	997.95	95.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.868	3.863	1/0	149731	19	>100:1	Target = 32.22		500.00	478.33		
498>478	55	3.860	3.863		4976	19	59:1	30.09 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.934	3.928	1	117042	17	>100:1			5000.00	5555.47	105.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.934	3.937	1/0	24968	15	>100:1	Target = 1.96		479.00	480.36		
527 > 81	65	3.934	3.937		10525	24	58:1	2.37 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.540	4.535	1/0	27714	23	>100:1	Target = 3.34		482.00	401.69		
627 > 80	65	4.540	4.535		10935	17	45:1	2.53 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.937	1	635220	18	>100:1			1000.00	1002.31	95.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.934	3.937	1/0	354543	18	>100:1	Target = 13.93		500.00	504.15		
513 > 169	51	3.942	3.937		23460	22	>100:1	15.11 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.102	4.098	1	642771	17	>100:1			5000.00	4795.32	96.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.102	4.107	0/-1	52858	31	>100:1	Target = 1.31	0.08	500.00	510.16		M
570 > 483	58	4.102	4.107		40074	32	>100:1	1.31 (0.65-1.97)	0.07				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.252	4.257	1	707166	16	>100:1			1000.00	1052.65	103.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.252	4.257	1/0	328922	16	>100:1	Target = 14.01		500.00	515.33		
563 > 169	52	4.252	4.257		22974	21	99:1	14.31 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.252	4.257	1	590881	17	>100:1			5000.00	4895.35	93.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.262	4.267	0/-1	64123	33	>100:1	Target = 1.75		500.00	526.45		M
584 > 526	60	4.262	4.267		35693	30	>100:1	1.79 (0.87-2.62)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.287	1	101502	15	>100:1			1000.00	970.25	97.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.302	4.308	1/0	60328	14	>100:1			500.00	524.86		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.312	4.308	1	54846	14	>100:1			1000.00	986.33	113.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.322	4.318	1/0	31097	17	>100:1	Target = 1.04		500.00	510.77		
512 > 219	57	4.312	4.318		29441	17	77:1	1.05 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.454	1	121008	16	>100:1			1000.00	1015.53	107.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.468	4.472	1/0	55274	14	>100:1			500.00	486.76		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.481	1	49207	16	>100:1			1000.00	964.57	97.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.486	4.481	1/0	27177	16	>100:1	Target = 1.05		500.00	479.57		
526 > 219	59	4.486	4.481		27053	18	>100:1	1.00 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.531	4.526	1	703607	17	>100:1			1000.00	1040.67	102.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.531	4.526	1/0	363994	18	>100:1	Target = 10.52		500.00	487.03		
613 > 169	38	4.531	4.526		32534	16	>100:1	11.18 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.772	4.769	1/0	306149	21	>100:1	Target = 7.51		500.00	480.02		
663 > 169	38	4.772	4.769		39750	24	>100:1	7.70 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.990	4.992	0	954477	20	>100:1			1000.00	1011.80	100.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.990	4.998	0/0	390674	20	74:1	Target = 11.12		500.00	496.39		
713 > 169	42	4.990	4.998		34439	18	>100:1	11.34 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.394	5.390	1	922972	19	>100:1			1000.00	999.77	99.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.394	5.390	1/0	336777	18	69:1	Target = 10.69		500.00	514.51		
813 > 269	40	5.394	5.390		30524	17	>100:1	11.03 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.772	5.775	1/0	411986	22	35:1	Target = 13.29		500.00	505.97		
913 > 319	40	5.772	5.775		30188	22	>100:1	13.64 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.934	3.937	1	710112	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.442	0	592976	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.201	1	590213	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.710	1.711	0	549732	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.577	1	147337	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021017.d
Injection Date: 20-Aug-2021 18:32:39 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 5 Auto Sampler: 5
Sample Info: F.L. ICAL 1000_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	1	612112	21	>100:1			1000.00	1018.28	100	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	1/0	653288	21	>100:1			1000.00	1014.64		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	629666	15	>100:1			1000.00	1013.46	100	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	681082	14	>100:1			1000.00	1007.78		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	193652	14	>100:1			1000.00	1025.80	100	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	222140	15	>100:1	Target = 3.41		884.00	880.53		
298.9 > 99	44	2.141	2.141		60033	14	>100:1	3.70 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	153029	16	>100:1	Target = 2.92		938.00	917.55		
349 > 99	44	2.478	2.478		56370	17	>100:1	2.71 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	105591	19	>100:1			5000.00	5085.75	100	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	42110	16	>100:1	Target = 1.58		934.00	940.18		
327 > 81	63	2.407	2.407		23480	15	>100:1	1.79 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	649325	18	>100:1			1000.00	982.98	100	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	1/0	731813	18	>100:1	Target = 18.69		1000.00	1112.53		
313 > 119	49	2.442	2.442		36016	15	>100:1	20.31 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	1	1220862	17	>100:1			5000.00	5169.12	100	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	1/0	346222	18	>100:1	Target = 0.78		2000.00	2071.32		
285 > 185	66	2.558	2.558		420655	17	>100:1	0.82 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	573719	17	>100:1			1000.00	1070.43	100	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	618730	18	>100:1	Target = 3.75		1000.00	965.70		
363 > 169	47	2.818	2.818		166927	18	>100:1	3.70 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	146711	17	>100:1			1000.00	1030.71	100	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/0	144349	25	>100:1	Target = 2.79	0.18	910.00	895.63		
399 > 99	45	2.836	2.836		51701	23	>100:1	2.79 (1.39-4.19)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/0	1048469	17	>100:1	Target = 3.21		942.00	1019.23		
377 > 85	45	2.854	2.864		295193	18	>100:1	3.55 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.208	1/0	142033	20	>100:1	Target = 3.03		952.00	919.81		
449 > 99	45	3.208	3.208		48434	19	>100:1	2.93 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.181	1	96908	20	>100:1			5000.00	5366.18	100	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.174	3.174	0/-1	43099	19	>100:1	Target = 1.94		948.00	881.65		
427 > 81	64	3.181	3.174		23661	19	>100:1	1.82 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.201	3.201	1	563802	20	>100:1			1000.00	1001.93	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.201	3.201	0/-1	574098	19	>100:1	Target = 2.91		1000.00	1020.46		
413 > 169	53	3.201	3.201		197614	21	>100:1	2.90 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.577	3.577	1	149352	19	>100:1			1000.00	1040.28	100	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	0/-1	147230	35	>100:1	Target = 3.38	0.25	928.00	864.66		M
499 > 99	54	3.577	3.585		41009	32	>100:1	3.59 (1.69-5.07)	0.07				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.790	3.790	1/0	472733	18	>100:1			932.00	850.14		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.920	3.920	0/-1	112465	18	>100:1	Target = 2.80		960.00	890.90		
549 > 99	54	3.928	3.920		43560	17	>100:1	2.58 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.237	1/0	111190	15	>100:1	Target = 3.15		964.00	904.30		
599 > 99	54	4.237	4.237		40963	15	>100:1	2.71 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.398	4.398	1/0	437971	18	>100:1			942.00	909.35		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.742	4.742	0/-1	95824	18	>100:1	Target = 3.01		968.00	891.25		
699 > 99	54	4.742	4.742		31954	19	>100:1	2.99 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.585	1	662557	18	>100:1			1000.00	1003.20	100	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.585	3.585	1/0	718216	19	>100:1	Target = 6.48		1000.00	1013.31		
463 > 169	56	3.585	3.585		108461	19	>100:1	6.62 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.863	0	313093	17	>100:1			1000.00	1042.62	100	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.863	0/0	330597	17	>100:1	Target = 32.22		1000.00	1010.88		
498>478	55	3.863	3.863		9562	16	87:1	34.57 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.928	3.928	0	110833	18	>100:1			5000.00	5260.76	100	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.937	1/1	51321	23	>100:1	Target = 1.96		958.00	1042.68		
527 > 81	65	3.928	3.937		25216	23	>100:1	2.03 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.535	4.535	0/0	65551	16	>100:1	Target = 3.34		964.00	1003.34		
627 > 80	65	4.535	4.535		17510	19	>100:1	3.74 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.937	3.937	1	663112	18	>100:1			1000.00	1046.32	100	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.937	3.937	1/0	690717	18	>100:1	Target = 13.93		1000.00	940.87		
513 > 169	51	3.945	3.937		54026	16	>100:1	12.78 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	663389	18	>100:1			5000.00	4949.14	100	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	0/-1	107983	30	>100:1	Target = 1.31	0.08	1000.00	1009.81		M
570 > 483	58	4.098	4.107		82345	30	>100:1	1.31 (0.65-1.97)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.257	1	681974	16	>100:1			1000.00	1015.15	100	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.257	4.257	1/0	628447	15	>100:1	Target = 14.01		1000.00	1020.98		
563 > 169	52	4.257	4.257		46386	20	>100:1	13.54 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.257	4.257	1	633381	16	>100:1			5000.00	5247.46	100	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	0/-1	118761	33	>100:1	Target = 1.75		1000.00	909.60		M
584 > 526	60	4.257	4.267		73574	29	>100:1	1.61 (0.87-2.62)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.287	4.287	0	103682	12	>100:1			1000.00	991.09	100	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.308	4.308	1/1	125546	13	>100:1			1000.00	1069.30		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.308	4.308	0	48151	13	>100:1			1000.00	865.93	100	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.318	1/1	58635	14	>100:1	Target = 1.04		1000.00	1096.98		
512 > 219	57	4.318	4.318		69434	15	>100:1	0.84 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.454	4.454	0	112837	17	>100:1			1000.00	946.96	100	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.472	4.472	1/1	110078	17	>100:1			1000.00	1060.10		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.481	1	50649	14	>100:1			1000.00	992.84	100	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.481	4.481	0/-1	56768	15	>100:1	Target = 1.05		1000.00	973.23		
526 > 219	59	4.490	4.481		55660	14	>100:1	1.01 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.526	4.526	1	687538	17	>100:1			1000.00	1016.91	100	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.526	4.526	1/0	707248	16	>100:1	Target = 10.52		1000.00	968.43		
613 > 169	38	4.526	4.526		67838	16	>100:1	10.42 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.769	4.769	0/-1	644832	19	>100:1	Target = 7.51		1000.00	1034.67		
663 > 169	38	4.769	4.769		80078	20	>100:1	8.05 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.992	4.992	1	948336	20	>100:1			1000.00	1005.29	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	1/0	780181	21	>100:1	Target = 11.12		1000.00	997.72		
713 > 169	42	4.992	4.998		69024	21	>100:1	11.30 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.390	1	930923	18	>100:1			1000.00	1008.38	100	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.390	5.390	1/0	647029	18	>100:1	Target = 10.69		1000.00	980.06		
813 > 269	40	5.390	5.390		60650	19	>100:1	10.66 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.775	5.775	1/0	816461	23	72:1	Target = 13.29		1000.00	994.15		
913 > 319	40	5.775	5.775		60167	23	>100:1	13.56 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.937	3.937	1	779629	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	1	708776	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.201	3.201	1	635131	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	601915	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.577	3.577	0	152674	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021018.d
Injection Date: 20-Aug-2021 18:43:14 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 6 Auto Sampler: 6
Sample Info: F.L. ICAL 2000_SVLC-1601 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-6 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.709	1.711	0	610466	20	>100:1			1000.00	1015.54	99.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.711	1/1	1236213	22	>100:1			2000.00	1925.18		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.083	2.077	1	638720	17	>100:1			1000.00	1028.03	101.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.083	2.088	0/-1	1344258	16	>100:1			2000.00	1960.88		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.136	2.141	0	192763	15	>100:1			1000.00	1021.09	99.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.136	2.141	0/0	428637	15	>100:1	Target = 3.41		1768.00	1706.90		
298.9 > 99	44	2.136	2.141		122733	15	>100:1	3.49 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.478	0/0	299151	17	>100:1	Target = 2.92		1876.00	1801.96		
349 > 99	44	2.477	2.478		105394	17	>100:1	2.83 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.405	2.407	0	103421	18	>100:1			5000.00	4981.23	97.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.405	2.407	0/0	78061	17	>100:1	Target = 1.58		1868.00	1779.42		
327 > 81	63	2.405	2.407		45730	15	>100:1	1.70 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.442	0	676258	17	>100:1			1000.00	1023.76	104.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.442	0/0	1292511	18	>100:1	Target = 18.69		2000.00	1886.67		
313 > 119	49	2.441	2.442		71493	17	>100:1	18.07 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.557	2.558	0	1179535	17	>100:1			5000.00	4994.14	96.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.566	2.558	1/1	673221	18	>100:1	Target = 0.78		4000.00	4204.37		
285 > 185	66	2.557	2.558		821328	16	>100:1	0.81 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.817	2.818	0	531781	17	>100:1			1000.00	992.19	92.7	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.817	2.818	0/0	1133157	18	>100:1	Target = 3.75		2000.00	1908.08		
363 > 169	47	2.817	2.818		321383	17	>100:1	3.52 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.836	0	143590	16	>100:1			1000.00	1008.78	97.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.836	0/0	284958	25	>100:1	Target = 2.79	0.19	1820.00	1806.48		
399 > 99	45	2.826	2.836		90177	24	>100:1	3.15 (1.39-4.19)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.853	2.864	0/0	1869067	18	>100:1	Target = 3.21		1884.00	1856.43		
377 > 85	45	2.853	2.864		602367	18	>100:1	3.10 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.205	3.208	0/0	280561	21		Target = 3.03		1904.00	1856.42		
449 > 99	45	3.211	3.208		96115	20	>100:1	2.91 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.181	0	89901	21	>100:1			5000.00	4978.18	92.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.178	3.174	1/1	86244	22	>100:1	Target = 1.94		1896.00	1901.74		
427 > 81	64	3.178	3.174		47289	22	>100:1	1.82 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.201	1	567014	21	>100:1			1000.00	1007.64	100.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.201	1/0	1123021	21	>100:1	Target = 2.91		2000.00	1984.86		
413 > 169	53	3.198	3.201		387413	20	>100:1	2.89 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.574	3.577	0	145329	18	>100:1			1000.00	1012.26	97.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.585	0/0	287856	36	>100:1	Target = 3.38	0.27	1856.00	1737.33		
499 > 99	54	3.582	3.585		85418	34	>100:1	3.36 (1.69-5.07)	0.11				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.790	0/0	955915	19	>100:1			1864.00	1766.65		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.925	3.920	1/1	232614	20	>100:1	Target = 2.80		1920.00	1893.68		
549 > 99	54	3.925	3.920		84669	21	>100:1	2.74 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.231	4.237	0/0	218005	17		Target = 3.15		1928.00	1822.09		
599 > 99	54	4.231	4.237		82711	14		2.63 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.393	4.398	0/0	867006	17	>100:1			1884.00	1849.99		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.745	4.742	1/1	191397	20	>100:1	Target = 3.01		1936.00	1829.45		
699 > 99	54	4.745	4.742		64681	20		2.95 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.585	0	656460	19	>100:1			1000.00	993.97	99.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.590	3.585	1/1	1449947	19	>100:1	Target = 6.48		2000.00	2064.68		
463 > 169	56	3.582	3.585		205213	19	>100:1	7.06 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.863	1	292074	18	>100:1			1000.00	972.62	93.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.868	3.863	1/0	651566	18	>100:1	Target = 32.22		2000.00	2135.69		
498>478	55	3.868	3.863		21690	19	>100:1	30.03 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.934	3.928	1	101902	22	>100:1			5000.00	4836.84	91.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.934	3.937	0/-1	87937	18	>100:1	Target = 1.96		1916.00	1943.18		
527 > 81	65	3.934	3.937		47528	17	>100:1	1.85 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.540	4.535	1/0	130889	17	>100:1	Target = 3.34		1928.00	2179.00		
627 > 80	65	4.540	4.535		39902	15	>100:1	3.28 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.937	0	668235	17	>100:1			1000.00	1054.40	100.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.942	3.937	1/1	1361950	18	>100:1	Target = 13.93		2000.00	1840.97		
513 > 169	51	3.942	3.937		109209	16	>100:1	12.47 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.098	0	667120	17	>100:1			5000.00	4976.97	100.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.102	4.107	0/0	202444	33	>100:1	Target = 1.31	0.12	2000.00	1882.58		M
570 > 483	58	4.102	4.107		155150	31	>100:1	1.30 (0.65-1.97)	0.24				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.251	4.257	0	718387	16	>100:1			1000.00	1069.35	105.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.251	4.257	0/0	1330419	17	>100:1	Target = 14.01		2000.00	2051.85		
563 > 169	52	4.251	4.257		85070	15	>100:1	15.63 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.251	4.257	0	634337	17	>100:1			5000.00	5255.38	100.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.262	4.267	0/0	228005	33	>100:1	Target = 1.75		2000.00	1743.68		M
584 > 526	60	4.262	4.267		147383	30	>100:1	1.54 (0.87-2.62)	0.08				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.287	1	104751	14	>100:1			1000.00	1001.31	101	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.302	4.308	0/-1	245246	18	>100:1			2000.00	2067.49		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.312	4.308	1	53297	12	>100:1			1000.00	958.47	110.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.312	4.318	0/-1	113421	20	>100:1	Target = 1.04		2000.00	1917.08		
512 > 219	57	4.312	4.318		110895	15	>100:1	1.02 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.454	1	128976	16	>100:1			1000.00	1082.40	114.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.468	4.472	0/-1	224606	16	>100:1			2000.00	1906.58		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.481	0	54627	14	>100:1			1000.00	1070.81	107.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.486	4.481	1/1	112185	14	>100:1	Target = 1.05		2000.00	1783.23		
526 > 219	59	4.486	4.481		108358	15	>100:1	1.03 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.531	4.526	1	694489	17	>100:1			1000.00	1027.19	101	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.531	4.526	1/0	1453655	18	>100:1	Target = 10.52		2000.00	1970.56		
613 > 169	38	4.531	4.526		133748	17	>100:1	10.86 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.772	4.769	1/0	1203300	21	>100:1	Target = 7.51		2000.00	1911.44		
663 > 169	38	4.772	4.769		151987	21	>100:1	7.91 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.996	4.992	1	937013	20	>100:1			1000.00	993.28	98.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.996	4.998	0/-1	1515197	21	>100:1	Target = 11.12		2000.00	1961.10		
713 > 169	42	4.996	4.998		132776	18	>100:1	11.41 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.394	5.390	1	909846	18	>100:1			1000.00	985.55	97.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.394	5.390	1/0	1258523	18	>100:1	Target = 10.69		2000.00	1950.45		
813 > 269	40	5.394	5.390		119138	18	>100:1	10.56 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.772	5.775	0/-1	1599314	23	>100:1	Target = 13.29		2000.00	1992.49		
913 > 319	40	5.772	5.775		119627	22	>100:1	13.36 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.942	3.937	1	695301	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.442	0	594798	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.201	1	573295	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.709	1.711	0	558882	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.577	1	141674	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021019.d
Injection Date: 20-Aug-2021 18:53:48 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 7 Auto Sampler: 7
Sample Info: F.L. ICAL 5000_SVLC-1602 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-7 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.710	1.711	0	587119	21	>100:1			1000.00	976.70	95.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.717	1.711	1/1	3219153	22	>100:1			5000.00	5212.61		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.087	2.077	1	615520	17	>100:1			1000.00	990.69	97.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.087	2.088	0/-1	3365607	16	>100:1			5000.00	5094.48		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.140	2.141	0	185921	15	>100:1			1000.00	984.85	96	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.140	2.141	0/0	1070949	15	>100:1	Target = 3.41		4420.00	4421.62		
298.9 > 99	44	2.140	2.141		315667	15	>100:1	3.39 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.478	0/0	751218	18	>100:1	Target = 2.92		4690.00	4691.55		
349 > 99	44	2.477	2.478		275583	16	>100:1	2.72 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.407	0	105760	17	>100:1			5000.00	5093.89	100.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.407	0/0	198222	18	>100:1	Target = 1.58		4670.00	4418.58		
327 > 81	63	2.406	2.407		115975	17	>100:1	1.70 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.442	0	679627	17	>100:1			1000.00	1028.86	104.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.442	1/1	3126342	17	>100:1	Target = 18.69		5000.00	4540.88		
313 > 119	49	2.450	2.442		175427	16	>100:1	17.82 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.557	2.558	0	1199862	17	>100:1			5000.00	5080.21	98.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.557	2.558	0/0	1593376	19	>100:1	Target = 0.78		10000	9828.96		
285 > 185	66	2.566	2.558		2111620	18	>100:1	0.75 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.817	2.818	0	556560	18	>100:1			1000.00	1038.42	97	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.817	2.818	0/0	2937550	18	>100:1	Target = 3.75		5000.00	4726.21		
363 > 169	47	2.817	2.818		795012	17	>100:1	3.69 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.836	0	140160	16				1000.00	984.69	95.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.836	0/0	677621	25	>100:1	Target = 2.79	0.18	4550.00	4400.88		
399 > 99	45	2.835	2.836		241583	23	>100:1	2.80 (1.39-4.19)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.864	0/0	4880359	18	>100:1	Target = 3.21		4710.00	4966.00		
377 > 85	45	2.862	2.864		1459920	18	>100:1	3.34 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.211	3.208	1/1	709902	21	>100:1	Target = 3.03		4760.00	4812.24		
449 > 99	45	3.211	3.208		238156	20	>100:1	2.98 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.178	3.181	0	95227	20	>100:1			5000.00	5273.10	98.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.178	3.174	1/1	207283	21	>100:1	Target = 1.94		4740.00	4315.10		
427 > 81	64	3.178	3.174		104116	20	>100:1	1.99 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.201	1	562582	31	>100:1			1000.00	999.76	99.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.201	1/0	2781307	22	>100:1	Target = 2.91		5000.00	4954.49		
413 > 169	53	3.205	3.201		966953	22	>100:1	2.87 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.577	1	136973	19	>100:1			1000.00	954.06	91.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.585	0/-1	756612	39	>100:1	Target = 3.38	0.25	4640.00	4845.04		M
499 > 99	54	3.582	3.585		220292	37	>100:1	3.43 (1.69-5.07)	0.08				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.795	3.790	1/0	2516829	19	>100:1			4660.00	4935.18		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.934	3.920	1/0	631067	18	>100:1	Target = 2.80		4800.00	5450.83		
549 > 99	54	3.925	3.920		205635	18	>100:1	3.06 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.241	4.237	1/0	552439	16	>100:1	Target = 3.15		4820.00	4898.99		
599 > 99	54	4.241	4.237		202613	16	>100:1	2.72 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.393	4.398	0/-1	2207357	19	>100:1			4710.00	4997.31		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.745	4.742	1/0	518476	19	>100:1	Target = 3.01		4840.00	5258.14		
699 > 99	54	4.745	4.742		171357	19	>100:1	3.02 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.590	3.585	1	659112	19	>100:1			1000.00	997.98	99.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.590	3.585	1/0	3641124	20	>100:1	Target = 6.48		5000.00	5164.00		
463 > 169	56	3.590	3.585		552178	20	>100:1	6.59 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.863	1	303889	18	>100:1			1000.00	1011.97	97.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.868	3.863	1/0	1545315	19	>100:1	Target = 32.22		5000.00	4868.27		
498>478	55	3.876	3.863		46244	19	>100:1	33.41 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.934	3.928	1	111403	18				5000.00	5287.81	100.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.934	3.937	0/-1	216123	23	>100:1	Target = 1.96		4790.00	4368.46		
527 > 81	65	3.934	3.937		117922	16		1.83 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.540	4.535	1/0	275213	18		Target = 3.34		4820.00	4190.91		
627 > 80	65	4.540	4.535		86984	17	>100:1	3.16 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.942	3.937	1	644402	19	>100:1			1000.00	1016.80	97.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.942	3.937	1/0	3616950	19	>100:1	Target = 13.93		5000.00	5069.91		
513 > 169	51	3.942	3.937		261146	19	>100:1	13.85 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.102	4.098	1	658383	17	>100:1			5000.00	4911.79	99.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.102	4.107	0/-1	554884	32	>100:1	Target = 1.31	0.08	5000.00	5228.49		M
570 > 483	58	4.102	4.107		425198	31	>100:1	1.30 (0.65-1.97)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.251	4.257	0	713170	15	>100:1			1000.00	1061.58	104.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.251	4.257	0/0	2959092	17	>100:1	Target = 14.01		5000.00	4597.06		
563 > 169	52	4.251	4.257		235354	17	>100:1	12.57 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.262	4.257	1	614587	16	>100:1			5000.00	5091.75	97	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.262	4.267	0/-1	610084	35	>100:1	Target = 1.75		5000.00	4815.58		M
584 > 526	60	4.262	4.267		369109	30	>100:1	1.65 (0.87-2.62)	0.22				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.287	1	105919	15	>100:1			1000.00	1012.47	102.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.302	4.308	0/-1	579685	14	>100:1			5000.00	4833.01		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.312	4.308	1	58268	14	>100:1			1000.00	1047.87	121	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.322	4.318	1/0	297352	14	>100:1	Target = 1.04		5000.00	4597.16		
512 > 219	57	4.312	4.318		304415	15	>100:1	0.97 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.454	1	113367	20	>100:1			1000.00	951.41	100.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.468	4.472	0/-1	522231	17	>100:1			5000.00	5073.08		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.481	0	51734	15	>100:1			1000.00	1014.10	102.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.486	4.481	1/1	289472	14	>100:1	Target = 1.05		5000.00	4858.60		
526 > 219	59	4.486	4.481		291546	15	>100:1	0.99 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.531	4.526	1	666493	17	>100:1			1000.00	985.78	96.9	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.531	4.526	1/0	3658303	17	>100:1	Target = 10.52		5000.00	5167.46		
613 > 169	38	4.531	4.526		343411	16	>100:1	10.65 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.772	4.769	1/0	3119064	21	>100:1	Target = 7.51		5000.00	5162.76		
663 > 169	38	4.772	4.769		409058	19	>100:1	7.62 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.996	4.992	1	939910	21	>100:1			1000.00	996.36	99.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.996	4.998	0/-1	3940465	21	>100:1	Target = 11.12		5000.00	5084.39		
713 > 169	42	4.996	4.998		354026	21	>100:1	11.13 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.394	5.390	1	906520	18	>100:1			1000.00	981.95	97.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.394	5.390	1/0	3186899	18	>100:1	Target = 10.69		5000.00	4957.14		
813 > 269	40	5.394	5.390		292697	18	>100:1	10.88 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.779	5.775	1/0	4161065	24	>100:1	Target = 13.29		5000.00	5203.03		
913 > 319	40	5.772	5.775		306405	24	>100:1	13.58 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.942	3.937	1	722568	16	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.442	1	647550	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.201	1	573964	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.710	1.711	0	569173	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.582	3.577	1	157483	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021020.d
Injection Date: 20-Aug-2021 19:04:29 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 8 Auto Sampler: 8
Sample Info: F.L. ICAL 10000_SVLC-1603 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-8 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.711	1	564178	21	>100:1			1000.00	938.54	92.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.711	1/0	6101356	20	>100:1			10000	10281		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	1	571146	16	>100:1			1000.00	919.27	90.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	6393414	16	>100:1			10000	10430		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	184892	15	>100:1			1000.00	979.40	95.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	2067873	15	>100:1	Target = 3.41		8840.00	8585.13		
298.9 > 99	44	2.141	2.141		596254	15	>100:1	3.46 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	1512306	17	>100:1	Target = 2.92		9380.00	9497.31		
349 > 99	44	2.478	2.478		502679	17	>100:1	3.00 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	90095	18	>100:1			5000.00	4339.39	85.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	397050	18		Target = 1.58		9340.00	10390		
327 > 81	63	2.407	2.407		214041	17	>100:1	1.85 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	650218	17	>100:1			1000.00	984.34	100.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	1/0	6457352	17	>100:1	Target = 18.69		10000	9803.24		
313 > 119	49	2.442	2.442		344259	17	>100:1	18.75 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	1	1100763	17	>100:1			5000.00	4660.62	90.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	1/0	3035092	18	>100:1	Target = 0.78		20000	20446		
285 > 185	66	2.558	2.558		3871720	18	>100:1	0.78 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	486423	18	>100:1			1000.00	907.56	84.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	1/0	5578232	17	>100:1	Target = 3.75		10000	10269		
363 > 169	47	2.818	2.818		1451036	18	>100:1	3.84 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	131665	16	>100:1			1000.00	925.00	89.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/1	1347727	25	>100:1	Target = 2.79	0.18	9100.00	9317.69		
399 > 99	45	2.836	2.836		461608	23	>100:1	2.91 (1.39-4.19)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/1	8558305	18	>100:1	Target = 3.21		9420.00	9270.35		
377 > 85	45	2.864	2.864		2861770	18	>100:1	2.99 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.208	3.208	1/1	1286185	21	>100:1	Target = 3.03		9520.00	9281.24		
449 > 99	45	3.208	3.208		420588	20	>100:1	3.05 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.181	1	76778	22	>100:1			5000.00	4251.50	79.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.174	1/0	384014	20	>100:1	Target = 1.94		9480.00	9915.11		
427 > 81	64	3.181	3.174		210423	21	>100:1	1.82 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.201	3.201	1	528654	20	>100:1			1000.00	939.47	93.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.201	1/0	5041221	21	>100:1	Target = 2.91		10000	9556.53		
413 > 169	53	3.208	3.201		1822980	21	>100:1	2.76 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.577	3.577	1	127494	19	>100:1			1000.00	888.04	85.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	1/0	1415095	36	>100:1	Target = 3.38	0.24	9280.00	9735.42		
499 > 99	54	3.585	3.585		401966	35	>100:1	3.52 (1.69-5.07)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.790	3.790	1/0	5038015	20	>100:1			9320.00	10613		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.928	3.920	1/0	1037239	17	>100:1	Target = 2.80		9600.00	9625.23		
549 > 99	54	3.928	3.920		378144	18	>100:1	2.74 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.237	1/0	1118121	16	>100:1	Target = 3.15		9640.00	10653		
599 > 99	54	4.237	4.237		392675	15	>100:1	2.84 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.398	4.398	1/0	4050762	17	>100:1			9420.00	9852.48		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.748	4.742	1/0	960798	19	>100:1	Target = 3.01		9680.00	10468		
699 > 99	54	4.748	4.742		324286	20	>100:1	2.96 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.585	1	619854	19	>100:1			1000.00	938.54	93.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.585	3.585	1/0	6601252	19	>100:1	Target = 6.48		10000	9955.12		
463 > 169	56	3.585	3.585		1102429	18	>100:1	5.98 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.863	1	302094	19	>100:1			1000.00	1005.99	96.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.871	3.863	1/0	3059971	18	>100:1	Target = 32.22		10000	9697.23		
498>478	55	3.871	3.863		92718	16	>100:1	33.00 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.928	3.928	1	91945	18	>100:1			5000.00	4364.23	83	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.928	3.937	0/-1	391187	18	>100:1	Target = 1.96		9580.00	9580.33		
527 > 81	65	3.928	3.937		217201	18		1.80 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.544	4.535	1/0	556426	17	>100:1	Target = 3.34		9640.00	10266		
627 > 80	65	4.544	4.535		169157	18	>100:1	3.28 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.937	3.937	1	568927	17	>100:1			1000.00	897.71	85.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.937	3.937	1/0	6513843	18	>100:1	Target = 13.93		10000	10342		
513 > 169	51	3.937	3.937		460471	17	>100:1	14.14 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	628356	19	56:1			5000.00	4687.78	94.7	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	1/0	1037523	36	>100:1	Target = 1.31	0.09	10000	10243		M
570 > 483	58	4.107	4.107		780396	34	>100:1	1.32 (0.65-1.97)	0.13				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.257	1	591970	17	>100:1			1000.00	881.17	86.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.257	4.257	1/0	5839085	17	>100:1	Target = 14.01		10000	10928		
563 > 169	52	4.257	4.257		390656	15	>100:1	14.94 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.257	4.257	1	552410	17	>100:1			5000.00	4576.63	87.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	1/0	1076050	35	>100:1	Target = 1.75		10000	9449.59		M
584 > 526	60	4.267	4.267		692291	28	>100:1	1.55 (0.87-2.62)	0.25				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.297	4.287	1	97578	15	>100:1			1000.00	932.74	94.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.297	4.308	0/-1	1134073	15	>100:1			10000	10263		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.308	1	53535	13	>100:1			1000.00	962.75	111.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.318	1/0	574787	14	>100:1	Target = 1.04		10000	9672.04		
512 > 219	57	4.318	4.318		555453	14	>100:1	1.03 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.454	4.454	1	110085	17	>100:1			1000.00	923.86	97.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.472	4.472	1/0	1095194	16	>100:1			10000	10977		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.481	1	47473	15	>100:1			1000.00	930.58	93.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.490	4.481	1/0	547722	14	>100:1	Target = 1.05		10000	10018		
526 > 219	59	4.490	4.481		535154	17	>100:1	1.02 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.526	1	602897	16	>100:1			1000.00	891.72	87.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.526	4.526	1/0	6989310	17	>100:1	Target = 10.52		10000	10914		
613 > 169	38	4.535	4.526		640442	17	>100:1	10.91 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.775	4.769	1/0	5683818	21	>100:1	Target = 7.51		10000	10400		
663 > 169	38	4.775	4.769		712567	20	>100:1	7.97 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.992	1	923612	20	>100:1			1000.00	979.08	97.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	1/0	7433394	21	>100:1	Target = 11.12		10000	9760.56		
713 > 169	42	4.998	4.998		671566	20	>100:1	11.06 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.390	1	886879	18	>100:1			1000.00	960.67	95.3	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.399	5.390	1/0	5987157	19	>100:1	Target = 10.69		10000	9519.12		
813 > 269	40	5.399	5.390		540841	19	>100:1	11.07 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.775	5.775	1/0	7934814	23	>100:1	Target = 13.29		10000	10141		
913 > 319	40	5.775	5.775		586501	22	>100:1	13.52 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.937	3.937	1	665972	18							
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	1	611274	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.201	1	544064	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	1	530685	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	140620	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021021.d
Injection Date: 20-Aug-2021 19:15:07 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 9 Auto Sampler: 9
Sample Info: F.L. ICAL 15000_SVLC-1604 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-9 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	584822	21	>100:1			1000.00	972.88	95.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	8729100	20	>100:1			15000	14190		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	597215	15	>100:1			1000.00	961.23	94.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	0/-1	9045341	16	>100:1			15000	14111		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	0	181449	16	>100:1			1000.00	961.16	93.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	0/0	3068986	15	>100:1	Target = 3.41		13260	12983		
298.9 > 99	44	2.141	2.141		887132	15	>100:1	3.45 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	0/0	2273641	18	>100:1	Target = 2.92		14070	14549		
349 > 99	44	2.478	2.478		776890	17	>100:1	2.92 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	0	109769	18	>100:1			5000.00	5286.98	104	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	0/0	612321	17	>100:1	Target = 1.58		14010	13151		
327 > 81	63	2.407	2.407		320510	17	>100:1	1.91 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	0	626964	17	>100:1			1000.00	949.13	96.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.451	2.442	1/1	9255741	17	>100:1	Target = 18.69		15000	14573		
313 > 119	49	2.451	2.442		496375	17	>100:1	18.64 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1146635	18	>100:1			5000.00	4854.85	93.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.558	1/1	4800030	17	>100:1	Target = 0.78		30000	31060		
285 > 185	66	2.558	2.558		5910549	18	>100:1	0.81 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	512919	17	>100:1			1000.00	956.99	89.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	8577524	17	>100:1	Target = 3.75		15000	14975		
363 > 169	47	2.818	2.818		2324720	17	>100:1	3.68 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	140562	17	>100:1			1000.00	987.51	95.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	0/0	2111891	26	>100:1	Target = 2.79	0.19	13650	13677		
399 > 99	45	2.836	2.836		665867	23	>100:1	3.17 (1.39-4.19)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.864	0/0	12642418	18	>100:1	Target = 3.21		14130	12827		
377 > 85	45	2.863	2.864		4291757	18	>100:1	2.94 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.214	3.208	1/1	1886863	21	>100:1	Target = 3.03		14280	12754		
449 > 99	45	3.214	3.208		628078	21	>100:1	3.00 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.181	0	84679	21	>100:1			5000.00	4689.01	87.4	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.174	1/1	548414	21	>100:1	Target = 1.94		14220	12839		
427 > 81	64	3.181	3.174		294398	21	>100:1	1.86 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.207	3.201	1	511773	21	>100:1			1000.00	909.47	90.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.207	3.201	1/0	7258570	22	>100:1	Target = 2.91		15000	14214		
413 > 169	53	3.207	3.201		2538105	22	>100:1	2.85 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	139567	20	>100:1			1000.00	972.13	93.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	0/-1	2190505	35	>100:1	Target = 3.38	0.25	13920	13766		
499 > 99	54	3.585	3.585		645124	35	>100:1	3.39 (1.69-5.07)	0.07				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.797	3.790	1/0	7048212	19	>100:1			13980	13564		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.927	3.920	1/0	1646014	17	>100:1	Target = 2.80		14400	13953		
549 > 99	54	3.927	3.920		605858	16	>100:1	2.71 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.236	4.237	0/-1	1600175	16	>100:1	Target = 3.15		14460	13926		
599 > 99	54	4.236	4.237		603907	17	>100:1	2.64 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.397	4.398	0/-1	6147735	18	>100:1			14130	13659		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.747	4.742	1/0	1486002	19	>100:1	Target = 3.01		14520	14790		
699 > 99	54	4.747	4.742		488780	20	>100:1	3.04 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.593	3.585	1	622392	19	>100:1			1000.00	942.38	93.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.593	3.585	1/0	9819541	20	>100:1	Target = 6.48		15000	14748		
463 > 169	56	3.593	3.585		1578175	19	>100:1	6.22 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.870	3.863	1	285379	19	>100:1			1000.00	950.33	91.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.870	3.863	1/0	4591315	18	>100:1	Target = 32.22		15000	15402		
498>478	55	3.870	3.863		150076	18		30.59 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.936	3.928	1	99927	20	>100:1			5000.00	4743.10	90.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.936	3.937	0/-1	594990	18	>100:1	Target = 1.96		14370	13408		
527 > 81	65	3.936	3.937		307796	19	>100:1	1.93 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.543	4.535	1/0	792371	18	>100:1	Target = 3.34		14460	13452		
627 > 80	65	4.543	4.535		261138	18	>100:1	3.03 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.944	3.937	1	583061	19	>100:1			1000.00	920.01	87.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.944	3.937	1/0	9149023	18	>100:1	Target = 13.93		15000	14173		
513 > 169	51	3.944	3.937		669746	18	>100:1	13.66 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.097	4.098	0	650892	17	48:1			5000.00	4855.91	98.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.106	4.107	0/0	1513360	32	>100:1	Target = 1.31	0.09	15000	14424		M
570 > 483	58	4.106	4.107		1161997	33	>100:1	1.30 (0.65-1.97)	0.11				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.256	4.257	0	623669	15	>100:1			1000.00	928.36	91.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.256	4.257	0/0	7907917	17	>100:1	Target = 14.01		15000	14048		
563 > 169	52	4.256	4.257		593867	15	>100:1	13.31 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.256	4.257	0	539669	17	>100:1			5000.00	4471.07	85.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.266	4.267	0/0	1619854	40	>100:1	Target = 1.75		15000	14561		M
584 > 526	60	4.266	4.267		1005058	31	>100:1	1.61 (0.87-2.62)	0.05				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.296	4.287	1	101335	13	>100:1			1000.00	968.66	97.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.307	4.308	0/-1	1674285	16	>100:1			15000	14590		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.317	4.308	1	54939	14	>100:1			1000.00	988.00	114.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.317	4.318	0/-1	900260	13	>100:1	Target = 1.04		15000	14762		
512 > 219	57	4.317	4.318		833282	14	>100:1	1.08 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.462	4.454	1	126899	21	>100:1			1000.00	1064.97	112.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.471	4.472	0/-1	1644166	17	>100:1			15000	14301		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.480	4.481	0	54770	18	>100:1			1000.00	1073.62	108.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.489	4.481	1/1	808230	14	>100:1	Target = 1.05		15000	12814		
526 > 219	59	4.489	4.481		851023	15	>100:1	0.94 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.534	4.526	1	650076	18	>100:1			1000.00	961.50	94.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.534	4.526	1/0	9641203	18	>100:1	Target = 10.52		15000	13962		
613 > 169	38	4.534	4.526		980376	17	>100:1	9.83 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.774	4.769	1/0	8586495	21	>100:1	Target = 7.51		15000	14572		
663 > 169	38	4.774	4.769		1087828	21	>100:1	7.89 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.997	4.992	1	934427	21	>100:1			1000.00	990.54	98.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.997	4.998	0/-1	11271630	21	>100:1	Target = 11.12		15000	14629		
713 > 169	42	4.997	4.998		1041990	21	>100:1	10.81 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.395	5.390	1	918543	17	>100:1			1000.00	994.97	98.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.395	5.390	1/0	8844370	19	>100:1	Target = 10.69		15000	13577		
813 > 269	40	5.395	5.390		830964	17	>100:1	10.64 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.780	5.775	1/0	11582563	23	>100:1	Target = 13.29		15000	14293		
913 > 319	40	5.780	5.775		901183	24	>100:1	12.85 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.944	3.937	1	664793	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	601331	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.207	3.201	1	546360	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	545012	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	136839	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021022.d
Injection Date: 20-Aug-2021 19:25:46 Injection Vol: 10.0 uL
Sample Type: Ical, Level: 10 Auto Sampler: 10
Sample Info: F.L. ICAL 20000_SVLC-1605 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-10 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	578242	21	>100:1			1000.00	961.93	94.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	11698456	20	>100:1			20000	19234		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	595547	17	>100:1			1000.00	958.54	94.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	12224455	16	>100:1			20000	19125		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	191379	15	>100:1			1000.00	1013.76	98.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	4282258	15	>100:1	Target = 3.41		17680	17176		
298.9 > 99	44	2.141	2.141		1234203	15	>100:1	3.46 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	3127331	18	>100:1	Target = 2.92		18760	18974		
349 > 99	44	2.478	2.478		1063777	18	>100:1	2.93 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	101193	17	>100:1			5000.00	4873.92	95.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	850663	17	>100:1	Target = 1.58		18680	19818		
327 > 81	63	2.407	2.407		456129	17	>100:1	1.86 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	658569	17	>100:1			1000.00	996.98	101.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.451	2.442	1/0	12481442	17	>100:1	Target = 18.69		20000	18708		
313 > 119	49	2.451	2.442		681665	17	>100:1	18.31 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	1	1129452	18	>100:1			5000.00	4782.09	92.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.558	1/0	6102749	18	>100:1	Target = 0.78		40000	40100		
285 > 185	66	2.558	2.558		7848682	18	>100:1	0.77 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	515988	17	>100:1			1000.00	962.72	89.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	10770688	17	>100:1	Target = 3.75		20000	18691		
363 > 169	47	2.818	2.818		3056003	17	>100:1	3.52 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	138655	17	>100:1			1000.00	974.11	94.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	0/0	2790272	26	>100:1	Target = 2.79	0.19	18200	18318		
399 > 99	45	2.836	2.836		899042	25	>100:1	3.10 (1.39-4.19)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	0/0	17705889	18	>100:1	Target = 3.21		18840	18212		
377 > 85	45	2.864	2.864		5921213	17	>100:1	2.99 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.214	3.208	1/1	2558734	21	>100:1	Target = 3.03		19040	17533		
449 > 99	45	3.214	3.208		877863	21	>100:1	2.91 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.174	3.181	0	88328	23	>100:1			5000.00	4891.07	91.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.174	1/1	764397	21	>100:1	Target = 1.94		18960	17156		
427 > 81	64	3.181	3.174		404783	22		1.88 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.201	1	505909	21	>100:1			1000.00	899.05	89.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.201	1/0	10183303	22	>100:1	Target = 2.91		20000	20172		
413 > 169	53	3.208	3.201		3567995	22	>100:1	2.85 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	139425	19	>100:1			1000.00	971.14	93.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	1/0	2975961	36	>100:1	Target = 3.38	0.27	18560	18722		
499 > 99	54	3.585	3.585		860339	37	>100:1	3.45 (1.69-5.07)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.799	3.790	1/0	9812083	19	>100:1			18640	18902		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.929	3.920	1/0	2188171	18	>100:1	Target = 2.80		19200	18568		
549 > 99	54	3.929	3.920		786359	17	>100:1	2.78 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.237	1/0	2144604	16	>100:1	Target = 3.15		19280	18684		
599 > 99	54	4.237	4.237		813758	16	>100:1	2.63 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.398	4.398	1/0	8489696	17	>100:1			18840	18882		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.749	4.742	1/0	2078076	19	>100:1	Target = 3.01		19360	20704		
699 > 99	54	4.749	4.742		678088	20	>100:1	3.06 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.585	1	642472	20	>100:1			1000.00	972.79	97	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.593	3.585	1/0	12827321	19	>100:1	Target = 6.48		20000	18663		
463 > 169	56	3.593	3.585		2071412	20	>100:1	6.19 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.863	1	285337	18	>100:1			1000.00	950.19	91.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.871	3.863	1/0	6374421	18	>100:1	Target = 32.22		20000	21387		
498>478	55	3.871	3.863		201085	18	>100:1	31.70 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.928	1	100773	17	>100:1			5000.00	4783.25	90.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.937	1/0	783311	19	>100:1	Target = 1.96		19160	17503		
527 > 81	65	3.937	3.937		418835	19	>100:1	1.87 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.545	4.535	1/0	1050772	18	>100:1	Target = 3.34		19280	17689		
627 > 80	65	4.545	4.535		315948	16	>100:1	3.32 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.946	3.937	1	605500	17	>100:1			1000.00	955.41	91.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.946	3.937	1/0	12756096	18	>100:1	Target = 13.93		20000	19029		
513 > 169	51	3.946	3.937		993945	19	>100:1	12.83 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	711283	17	46:1			5000.00	5306.45	107.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	1/0	2117179	35	>100:1	Target = 1.31	0.10	20000	18466		M
570 > 483	58	4.107	4.107		1597349	31	>100:1	1.32 (0.65-1.97)	0.24				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.258	4.257	1	581276	16	>100:1			1000.00	865.25	85.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.258	4.257	1/0	10554003	16	>100:1	Target = 14.01		20000	20116		
563 > 169	52	4.258	4.257		807010	15	>100:1	13.07 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.258	4.257	1	557940	15	>100:1			5000.00	4622.44	88.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.268	4.267	1/0	2133709	32	>100:1	Target = 1.75		20000	18552		M
584 > 526	60	4.268	4.267		1405459	31	>100:1	1.51 (0.87-2.62)	0.27				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.287	1	107812	13	>100:1			1000.00	1030.57	104	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.308	4.308	1/0	2246287	15	>100:1			20000	18399		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.308	4.308	1	63557	16	>100:1			1000.00	1142.98	132	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.318	1/0	1196662	14	>100:1	Target = 1.04		20000	16961		
512 > 219	57	4.318	4.318		1134829	15	>100:1	1.05 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.455	4.454	1	119758	15	>100:1			1000.00	1005.04	106.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.473	4.472	1/0	2318868	16	>100:1			20000	21382		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.482	4.481	1	49401	15	>100:1			1000.00	968.37	97.5	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.491	4.481	1/0	1132684	14	>100:1	Target = 1.05		20000	19909		
526 > 219	59	4.491	4.481		1145014	15	>100:1	0.98 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.527	4.526	1	651030	18	>100:1			1000.00	962.91	94.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.536	4.526	1/0	12839569	18	>100:1	Target = 10.52		20000	18567		
613 > 169	38	4.536	4.526		1253804	16	>100:1	10.24 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.776	4.769	1/0	11093078	21	>100:1	Target = 7.51		20000	18798		
663 > 169	38	4.776	4.769		1519190	19	>100:1	7.30 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.992	1	966619	21	>100:1			1000.00	1024.67	101.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	0/-1	14140854	21	>100:1	Target = 11.12		20000	17742		
713 > 169	42	4.998	4.998		1372085	21	>100:1	10.30 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.390	1	931649	18	>100:1			1000.00	1009.17	100.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.399	5.390	1/0	11931134	19	>100:1	Target = 10.69		20000	18058		
813 > 269	40	5.399	5.390		1128684	19	>100:1	10.57 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.782	5.775	1/0	15720730	24	>100:1	Target = 13.29		20000	19127		
913 > 319	40	5.782	5.775		1247742	24	>100:1	12.59 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.946	3.937	1	701785	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.442	1	613844	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.201	1	532997	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	544810	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	146571	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021023.d		
Injection Date:	20-Aug-2021 19:36:27	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	11
Lab Sample ID:	ID IBLK	Lab Prep. Batch:	
Sample Info:	ID IBLK	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V7	21-Apr-2021 14:28:49
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.711	1	605530	21	>100:1			1001.00	1007.33	98.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.711	1/0	10755	18	8.2:1			16.902	16.902		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	613134	16	>100:1			1001.00	986.85	97.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	195393	14	>100:1			1001.00	1035.02	100.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.141		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.478		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	106593	17	>100:1			5005.00	5134.01	100.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.407		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	626624	17	>100:1			1001.00	948.62	96.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.442		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	1	1210016	18	>100:1			5005.00	5123.20	99.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.558		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	576101	17	>100:1			1001.00	1074.88	100.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.818		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	146604	16				1001.00	1029.96	99.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.836		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.845	2.864	-1/-2	2370	13	3.2:1	Target = 3.55		2.3079	2.3079		
377 > 85	45	2.864	2.864		1924	23	5.8:1	1.23 (1.77-5.32)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.208		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.181	1	94785	20	>100:1			5005.00	5248.62	97.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.174		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.201	1	568810	21	>100:1			1001.00	1010.83	100.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.201		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	139967	18	>100:1			1001.00	974.91	93.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	1/0	1833	35	7.4:1	Target = 3.58	0.28	11.498	11.498		
499 > 99	54	3.585	3.585		239	10	4.5:1	7.66 (1.79-5.38)					
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.806	3.790	1/0	1715	22	6.4:1			3.2943	3.2943		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.920		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.237		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.398		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.755	4.742	1/0	575	13	12:1	Target = 2.99		5.7123	5.7123		
699 > 99	54	4.755	4.742		169	14		3.40 (1.49-4.49)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.593	3.585	1	653809	19	>100:1			1001.00	989.95	98.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.585		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.863	1	303634	18				1001.00	1011.12	97	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.863		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.928	1	114797	19	>100:1			5005.00	5448.91	103.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.937		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.535		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.945	3.937	1	629331	17	>100:1			1001.00	993.02	94.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.937		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	699078	18	>100:1			5005.00	5215.39	105.4	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.107		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.257	1	640208	15	>100:1			1001.00	952.98	93.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.257		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.257	4.257	1	670130	17	>100:1			5005.00	5551.92	105.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	1/0	2687	49		Target = 1.61	0.05	19.471	19.471		
584 > 526	60	4.277	4.267		1695	16	9.0:1	1.58 (0.80-2.42)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.297	4.287	1	99141	15	>100:1			1001.00	947.68	95.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.308		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.308	1	55066	18	>100:1			1001.00	990.28	114.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.318		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.463	4.454	1	117489	15	>100:1			1001.00	986.00	104.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.472		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.481	1	54124	16	>100:1			1001.00	1060.95	106.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.490	4.481	1/0	1480	13	16:1	Target = 1.01		23.768	23.768		
526 > 219	59	4.490	4.481		1636	11	11:1	0.90 (0.50-1.52)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.526	1	678444	17				1001.00	1003.46	98.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.526		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.775	4.769	1/0	3848	15	11:1	Target = 8.05		6.2634	6.2634		
663 > 169	38	4.775	4.769		1030	21	10.0:1	3.73 (4.02-12.07)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.992	1	921018	20	>100:1			1001.00	976.33	97.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	1/0	7641	22	11:1	Target = 11.30		10.071	10.071		
713 > 169	42	4.998	4.998		570	15	7.6:1	13.40 (5.65-16.95)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.390	1	946303	18	>100:1			1001.00	1025.04	101.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.399	5.390	1/0	13917	18	19:1	Target = 10.66		20.758	20.758		
813 > 269	40	5.399	5.390		1274	21	13:1	10.92 (5.33-16.00)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.789	5.775	1/0	12009	18	8.3:1	Target = 13.56		14.399	14.399		
913 > 319	40	5.789	5.775		1072	19	8.3:1	11.20 (6.78-20.35)					
*** 37 13C2_PFDA**													
515 > 470		3.945	3.937	1	761480	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.442	1	671165	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.201	3.201	1	609715	20	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	1	611765	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	143718	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021024.d
Injection Date: 20-Aug-2021 19:47:02 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC-1618 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	502.55	100.5	70 - 130
D 46 13C4_PFBA	612112	634452			103.6	50 - 150
D 50 13C5_PFPeA	629666	660499			104.9	50 - 150
21 PFPeA			500.00	486.47	97.3	70 - 130
7 PFBS			442.50	428.14	96.8	70 - 130
D 44 13C3_PFBS	193652	196489			101.5	50 - 150
1 4:2 FTS			467.50	460.18	98.4	70 - 130
D 63 13C2_4:2 FTS_2	105591	110830			105	50 - 150
D 49 13C5_PFHxA	649325	655078			100.9	50 - 150
15 PFHxA			500.00	530.58	106.1	70 - 130
22 PFPeS			470.00	494.51	105.2	70 - 130
28 GenX			2500.00	2248.93	90	70 - 130
D 66 13C3_GenX	1220862	1284433			105.2	50 - 150
D 47 13C4_PFHpA	573719	602229			105	50 - 150
13 PFHpA			500.00	432.58	86.5	70 - 130
D 45 13C3_PFHxS	146711	155165			105.8	50 - 150
14 PFHxS			456.00	446.64	97.9	70 - 130
29 ADONA			2355.00	2220.60	94.3	70 - 130
2 6:2 FTS			475.00	498.69	105	70 - 130
D 64 13C2_6:2 FTS_2	96908	93869			96.9	50 - 150
D 53 13C8_PFOA	563802	601347			106.7	50 - 150
20 PFOA			500.00	489.51	97.9	70 - 130
12 PFHpS			475.00	437.93	92.2	70 - 130
D 54 13C8_PFOS	149352	145974			97.7	50 - 150
18 PFOS			462.75	498.14	107.6	70 - 130
17 PFNA			500.00	500.46	100.1	70 - 130
D 56 13C9_PFNA	662557	683113			103.1	50 - 150
30 9Cl-PF3ONS			2330.00	2271.07	97.5	70 - 130
D 55 13C8_PFOSA	313093	328777			105	50 - 150
19 PFOSA			500.00	471.64	94.3	70 - 130
16 PFNS			480.00	505.89	105.4	70 - 130
D 65 13C2_8:2 FTS_2	110833	114992			103.8	50 - 150
10 PFDA			500.00	450.40	90.1	70 - 130
3 8:2 FTS			480.00	517.20	107.7	70 - 130
D 51 13C6_PFDA	663112	750001			113.1	50 - 150
D 58 d3-MeFOSAA	663389	763181			115	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	561.63	112.3	70 - 130
9 PFDS			482.50	503.84	104.4	70 - 130
25 PFUdA			500.00	566.91	113.4	70 - 130
D 60 d5-EtFOSAA	633381	684044			108	50 - 150
D 52 13C7_PFUdA	681974	713067			104.6	50 - 150
5 N-EtFOSAA			500.00	474.52	94.9	70 - 130
D 61 d7-MeFOSE	103682	114661			110.6	50 - 150
D 57 d3-MeFOSA	48151	60846			126.4	50 - 150
31 11Cl-PF3OUDS			2355.00	2317.96	98.4	70 - 130
D 62 d9-EtFOSE	112837	124421			110.3	50 - 150
D 59 d5-EtFOSA	50649	52801			104.2	50 - 150
11 PFDoA			500.00	489.55	97.9	70 - 130
D 38 13C2_PFDoA	687538	702316			102.1	50 - 150
4 10:2 FTS			2410.00	2279.84	94.6	70 - 130
24 PFTrDA			500.00	540.71	108.1	70 - 130
D 42 13C2_PFTeDA	948336	948443			100	50 - 150
23 PFTeDA			500.00	540.54	108.1	70 - 130
D 40 13C2_PFHxDA	930923	980938			105.4	50 - 150

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021024.d
Injection Date: 20-Aug-2021 19:47:02 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC-1618 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	634452	20	>100:1			1000.00	1055.44	103.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.711	0/0	335381	19	>100:1			500.00	502.55		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	660499	14	>100:1			1000.00	1063.08	104.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	0/-1	344869	17	>100:1			500.00	486.47		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	0	196489	14	>100:1			1000.00	1040.83	101.5	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	0/0	109594	17	>100:1	Target = 3.41		442.50	428.14		
298.9 > 99	44	2.141	2.141		30909	17	>100:1	3.54 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	0/0	83683	17	>100:1	Target = 2.92		470.00	494.51		
349 > 99	44	2.478	2.478		26660	15	>100:1	3.13 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	0	110830	18	>100:1			5000.00	5338.08	105	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	0/0	21634	18	>100:1	Target = 1.58		467.50	460.18		
327 > 81	63	2.407	2.407		12026	20	56:1	1.79 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	0	655078	17	>100:1			1000.00	991.69	100.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	0/0	352102	18	>100:1	Target = 18.69		500.00	530.58		
313 > 119	49	2.451	2.442		18233	13	>100:1	19.31 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1284433	17	>100:1			5000.00	5438.28	105.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	0/0	394962	17	>100:1	Target = 0.78		2500.00	2248.93		
285 > 185	66	2.567	2.558		529891	16	>100:1	0.74 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	602229	18	>100:1			1000.00	1123.63	105	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.818	2.818	0/0	290930	17	>100:1	Target = 3.75		500.00	432.58		
363 > 169	47	2.818	2.818		81700	16	>100:1	3.56 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	155165	17	>100:1			1000.00	1090.10	105.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	0/0	76134	24	>100:1	Target = 2.79	0.14	456.00	446.64		
399 > 99	45	2.836	2.836		24405	24	>100:1	3.11 (1.39-4.19)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.864	0/0	2415936	18	>100:1	Target = 3.21		2355.00	2220.60		
377 > 85	45	2.854	2.864		732763	18	>100:1	3.29 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.207	3.208	0/0	71520	21	>100:1	Target = 3.03		475.00	437.93		
449 > 99	45	3.214	3.208		23409	20	>100:1	3.05 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.174	3.181	0	93869	19	>100:1			5000.00	5197.90	96.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.174	1/1	23614	21	>100:1	Target = 1.94		475.00	498.69		
427 > 81	64	3.181	3.174		11320	21	76:1	2.08 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.201	3.201	0	601347	21	>100:1			1000.00	1068.65	106.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.207	3.201	1/1	293729	19	>100:1	Target = 2.91		500.00	489.51		
413 > 169	53	3.207	3.201		109657	19	>100:1	2.67 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	145974	19	>100:1			1000.00	1016.75	97.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	1/0	82903	37	>100:1	Target = 3.38	0.22	462.75	498.14		
499 > 99	54	3.585	3.585		23464	34	>100:1	3.53 (1.69-5.07)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.799	3.790	1/0	1234303	19	>100:1			2330.00	2271.07		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.929	3.920	1/0	62418	19	>100:1	Target = 2.80		480.00	505.89		
549 > 99	54	3.937	3.920		23528	15	>100:1	2.65 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.237	4.237	1/0	60550	15	>100:1	Target = 3.15		482.50	503.84		
599 > 99	54	4.237	4.237		18624	14		3.25 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.398	4.398	1/0	1091146	17	>100:1			2355.00	2317.96		
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.585	3.585	1	683113	19	>100:1			1000.00	1034.32	103.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.593	3.585	1/0	365723	20	>100:1	Target = 6.48		500.00	500.46		
463 > 169	56	3.585	3.585		55161	19	>100:1	6.63 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.863	1	328777	17	>100:1			1000.00	1094.85	105	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.871	3.863	1/0	161971	17	>100:1	Target = 32.22		500.00	471.64		
498>478	55	3.871	3.863		4071	22	38:1	39.78 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.928	1	114992	18	>100:1			5000.00	5458.17	103.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.937	1/0	26412	16	>100:1	Target = 1.96		480.00	517.20		
527 > 81	65	3.937	3.937		14098	22		1.87 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.544	4.535	1/0	154538	17	>100:1	Target = 3.34		2410.00	2279.84		
627 > 80	65	4.544	4.535		47488	16	>100:1	3.25 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.937	3.937	1	750001	18	>100:1			1000.00	1183.42	113.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.946	3.937	1/0	373978	18	>100:1	Target = 13.93		500.00	450.40		
513 > 169	51	3.937	3.937		29893	17	>100:1	12.51 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	763181	19	>100:1			5000.00	5693.63	115	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	1/0	69091	17	>100:1	Target = 1.31		500.00	561.63		
570 > 483	58	4.107	4.107		42671	18	>100:1	1.61 (0.65-1.97)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.257	1	713067	16	>100:1			1000.00	1061.43	104.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.257	4.257	1/0	364865	16	>100:1	Target = 14.01		500.00	566.91		
563 > 169	52	4.257	4.257		19630	12	98:1	18.58 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.257	4.257	1	684044	16	>100:1			5000.00	5667.19	108	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.268	4.267	1/0	66911	16		Target = 1.75		500.00	474.52		
584 > 526	60	4.268	4.267		41604	14	>100:1	1.60 (0.87-2.62)					
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.287	1	114661	13	>100:1			1000.00	1096.04	110.6	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.318	4.308	1	60846	13	>100:1			1000.00	1094.23	126.4	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.464	4.454	1	124421	16	>100:1			1000.00	1044.17	110.3	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.482	4.481	1	52801	16	>100:1			1000.00	1035.02	104.2	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.536	4.526	1	702316	16	>100:1			1000.00	1038.76	102.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.536	4.526	1/0	365208	16	>100:1	Target = 10.52		500.00	489.55		
613 > 169	38	4.536	4.526		34902	22	>100:1	10.46 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.775	4.769	1/0	344228	21	>100:1	Target = 7.51		500.00	540.71		
663 > 169	38	4.775	4.769		43594	28	>100:1	7.89 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.992	1	948443	19	>100:1			1000.00	1005.40	100	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	0/-1	422726	21	82:1	Target = 11.12		500.00	540.54		
713 > 169	42	4.998	4.998		37555	19	>100:1	11.25 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.398	5.390	1	980938	19	>100:1			1000.00	1062.56	105.4	
*** 37 13C2_PFDA**													
515 > 470		3.946	3.937	1	787518	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	678631	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.207	3.201	1	611364	21	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	627595	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	158151	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021025.d
Injection Date: 20-Aug-2021 19:57:36 Injection Vol: 10.0 uL
Sample Type: CheckStd Auto Sampler: 13
Sample Info: ISOMER CHECK STD_SVLC-1442 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: IsomerCheck Conc. Level: Smp Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	650706	22	>100:1			1000.00	1082.48	106.3	
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	0	690113	17	>100:1			1000.00	1110.75	109.6	
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	223295	16	>100:1			1000.00	1182.82	115.3	
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	102145	19	>100:1			5000.00	4919.77	96.7	
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	1	697352	18	>100:1			1000.00	1055.69	107.4	
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1311364	18	>100:1			5000.00	5552.31	107.4	
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	589791	18	>100:1			1000.00	1100.42	102.8	
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	0	144138	19	>100:1			1000.00	1012.63	98.2	
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.181	3.181	0	92189	22	>100:1			5000.00	5104.87	95.1	
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.207	3.201	1	563884	22	>100:1			1000.00	1002.07	100	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.201	3.201	0/-1	6501771	38	>100:1	Target = 2.90		10000	11555		M
413 > 169	53	3.201	3.201		2348431	33	>100:1	2.76 (1.45-4.35)	0.23				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	145602	19	>100:1			1000.00	1014.16	97.5	
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.593	3.585	1	707985	19	>100:1			1000.00	1071.98	106.9	
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.863	1	318999	23	>100:1			1000.00	1062.28	101.9	
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.928	1	123725	19	>100:1			5000.00	5872.68	111.6	
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.945	3.937	1	686053	17	>100:1			1000.00	1082.52	103.5	
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.098	4.098	1	727803	16	>100:1			5000.00	5429.69	109.7	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	1/0	1440207	35	>100:1	Target = 1.31	0.08	10000	12276		M
570 > 483	58	4.107	4.107		1102524	30	>100:1	1.30 (0.65-1.96)	0.12				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.257	4.257	1	743527	16	>100:1			1000.00	1106.77	109	
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.257	4.257	1	655436	16	>100:1			5000.00	5430.18	103.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	1/0	1543967	36	>100:1	Target = 1.61		10000	11427		M
584 > 526	60	4.267	4.267		996009	32	>100:1	1.55 (0.80-2.42)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.298	4.287	1	115863	14	>100:1			1000.00	1107.53	111.7	
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.308	4.308	1	56212	14	>100:1			1000.00	1010.89	116.7	
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.454	4.454	1	124073	15	>100:1			1000.00	1041.25	110	
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.481	4.481	1	52292	15	>100:1			1000.00	1025.04	103.2	
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.526	1	709799	17	>100:1			1000.00	1049.83	103.2	
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.992	1	1009420	20	>100:1			1000.00	1070.04	106.4	
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.390	1	1062554	19	>100:1			1000.00	1150.97	114.1	
*** 37 13C2_PFDA**													
515 > 470		3.937	3.937	1	785798	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	1	693248	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.201	3.201	0	587570	22	>100:1						
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	617010	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	148152	20							

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421006.d
Injection Date: 14-Aug-2021 13:22:33 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 100_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	101.37	101.4	70 - 130
D 46 13C4_PFBA	574801	528070			91.9	50 - 150
D 50 13C5_PFPeA	538043	506060			94.1	50 - 150
21 PFPeA			100.00	103.57	103.6	70 - 130
7 PFBS			88.400	87.780	99.3	70 - 130
D 44 13C3_PFBS	187099	175048			93.6	50 - 150
1 4:2 FTS			93.400	89.441	95.8	70 - 130
D 63 13C2_4:2 FTS_2	103169	96457			93.5	50 - 150
D 49 13C5_PFHxA	593317	566783			95.5	50 - 150
15 PFHxA			100.00	96.807	96.8	70 - 130
22 PFPeS			93.800	78.584	83.8	70 - 130
28 GenX			200.00	217.98	109	70 - 130
D 66 13C3_GenX	1107213	1043199			94.2	50 - 150
D 47 13C4_PFHpA	479053	435147			90.8	50 - 150
13 PFHpA			100.00	107.37	107.4	70 - 130
D 45 13C3_PFHxS	139557	122565			87.8	50 - 150
14 PFHxS			91.000	97.526	107.2	70 - 130
29 ADONA			94.200	92.850	98.6	70 - 130
D 64 13C2_6:2 FTS_2	86994	84328			96.9	50 - 150
2 6:2 FTS			94.800	100.76	106.3	70 - 130
D 53 13C8_PFOA	486725	471343			96.8	50 - 150
20 PFOA			100.00	113.29	113.3	70 - 130
12 PFHpS			95.200	107.34	112.7	70 - 130
18 PFOS			92.800	96.274	103.7	70 - 130
D 54 13C8_PFOS	130612	121340			92.9	50 - 150
17 PFNA			100.00	104.06	104.1	70 - 130
D 56 13C9_PFNA	580651	533018			91.8	50 - 150
30 9Cl-PF3ONS			93.200	82.486	88.5	70 - 130
D 55 13C8_PFOSA	268160	264521			98.6	50 - 150
19 PFOSA			100.00	104.56	104.6	70 - 130
16 PFNS			96.000	123.47	128.6	70 - 130
D 65 13C2_8:2 FTS_2	97398	83315			85.5	50 - 150
3 8:2 FTS			95.800	75.111	78.4	70 - 130
10 PFDA			100.00	96.238	96.2	70 - 130
D 51 13C6_PFDA	542953	536456			98.8	50 - 150
6 N-MeFOSAA			100.00	97.491	97.5	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	682896			114.5	50 - 150
9 PFDS			96.400	72.117	74.8	70 - 130
D 60 d5-EtFOSAA	592804	647090			109.2	50 - 150
D 52 13C7_PFUdA	631526	526346			83.3	50 - 150
5 N-EtFOSAA			100.00	83.122	83.1	70 - 130
25 PFUdA			100.00	113.13	113.1	70 - 130
D 61 d7-MeFOSE	89085	79416			89.1	50 - 150
32 MeFOSE			100.00	122.27	122.3	70 - 130
D 57 d3-MeFOSA	50589	51765			102.3	50 - 150
26 MeFOSA			100.00	100.96	101	70 - 130
31 11Cl-PF3OUDS			94.200	100.62	106.8	70 - 130
D 62 d9-EtFOSE	90529	92317			102	50 - 150
33 EtFOSE			100.00	103.57	103.6	70 - 130
D 59 d5-EtFOSA	43442	42856			98.7	50 - 150
27 EtFOSA			100.00	105.37	105.4	70 - 130
11 PFDoA			100.00	98.563	98.6	70 - 130
D 38 13C2_PFDoA	595792	542630			91.1	50 - 150
4 10:2 FTS			96.400	96.627	100.2	70 - 130
34 PFDOS			96.800	97.321	100.5	70 - 130
24 PFTrDA			100.00	107.60	107.6	70 - 130
23 PFTeDA			100.00	101.61	101.6	70 - 130
D 42 13C2_PFTeDA	902749	824266			91.3	50 - 150
35 PFHxDA			100.00	107.25	107.3	70 - 130
D 40 13C2_PFHxDA	845704	828267			97.9	50 - 150
36 PFODA			100.00	99.259	99.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421006.d
Injection Date: 14-Aug-2021 13:22:33 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 100_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	1	528070	22	>100:1			1000.00	950.74	91.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.718	1/0	53498	22	53:1			100.00	101.37		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	2	506060	17	>100:1			1000.00	972.19	94.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.098	2/0	57150	16	72:1			100.00	103.57		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	2	175048	15	>100:1			1000.00	975.75	93.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	2/0	18320	16	>100:1	Target = 3.26		88.400	87.780		
298.9 > 99	44	2.151	2.151		5620	22	42:1	3.25 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.496	3/1	12344	26	>100:1	Target = 3.15		93.800	78.584		
349 > 99	44	2.496	2.496		4608	19	41:1	2.67 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.415	2	96457	17	>100:1			5000.00	4827.58	93.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.424	2.424	3/1	3716	24	48:1	Target = 1.68		93.400	89.441		
327 > 81	63	2.433	2.424		3566	24	22:1	1.04 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.460	2	566783	17	>100:1			1000.00	969.03	95.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.460	2/0	57333	18	>100:1	Target = 18.18		100.00	96.807		
313 > 119	49	2.469	2.460		3329	17	19:1	17.22 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.575	2	1043199	18	>100:1			5000.00	4844.94	94.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	2/0	31758	21	64:1	Target = 0.79		200.00	217.98		
285 > 185	66	2.575	2.575		39846	19	89:1	0.79 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.836	3	435147	17	>100:1			1000.00	899.56	90.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.836	3/0	52192	18	>100:1	Target = 3.65		100.00	107.37		
363 > 169	47	2.827	2.836		16384	18	>100:1	3.18 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.845	2	122565	17				1000.00	912.79	87.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.845	2/0	13093	24	>100:1	Target = 3.10	0.14	91.000	97.526		
399 > 99	45	2.854	2.845		3807	15	28:1	3.43 (1.55-4.66)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.873	3/1	74978	17	>100:1	Target = 3.01		94.200	92.850		
377 > 85	45	2.873	2.873		25844	18	89:1	2.90 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.221	3.221	3/1	12518	38	>100:1	Target = 2.85		95.200	107.34		
449 > 99	45	3.221	3.221		4168	21	28:1	3.00 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.194	3.194	3	84328	21	>100:1			5000.00	5226.31	96.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.201	3.201	0/-3	4131	17		Target = 1.74		94.800	100.76		M
427 > 81	64	3.201	3.201		1444	13	20:1	2.86 (0.87-2.62)					M
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.221	3.221	3	471343	22	>100:1			1000.00	1011.89	96.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.214	3.214	0/-3	53151	17	33:1	Target = 2.92		100.00	113.29		M
413 > 169	53	3.214	3.214		15683	18	53:1	3.38 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.593	3.593	3	121340	21	>100:1			1000.00	912.11	92.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.601	3.601	4/1	13241	33	60:1	Target = 3.34	0.43	92.800	96.274		
499 > 99	54	3.593	3.601		2388	27	27:1	5.54 (1.67-5.02)	0.17				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.806	3.806	3/0	37959	17	>100:1			93.200	82.486		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.945	3.945	3/0	12261	22	63:1	Target = 2.63		96.000	123.47		
549 > 99	54	3.945	3.945		4107	14	24:1	2.98 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.247	4.247	3/0	7233	18	73:1	Target = 2.65		96.400	72.117		
599 > 99	54	4.257	4.247		2718	17	18:1	2.66 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.405	4.405	3/0	40612	18	>100:1			94.200	100.62		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.748	4.748	2/-1	8840	26	>100:1	Target = 3.08		96.800	97.321		
699 > 99	54	4.748	4.748		3535	19	79:1	2.50 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.601	3.601	3	533018	20	>100:1			1000.00	935.56	91.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.601	3.601	3/0	61005	20	>100:1	Target = 6.55		100.00	104.06		
463 > 169	56	3.601	3.601		8383	18	62:1	7.27 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.895	3.895	4	264521	17	>100:1			1000.00	969.27	98.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.895	3.895	4/0	30985	17	>100:1	Target = 33.36		100.00	104.56		
498>478	55	3.895	3.895		971	14	11:1	31.91 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.937	3	83315	17				5000.00	4360.63	85.5	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.945	3.945	3/0	2803	16	18:1	Target = 2.44		95.800	75.111		
527 > 81	65	3.954	3.945		794	16	8.3:1	3.53 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.552	4.552	3/0	4156	15	49:1	Target = 3.72		96.400	96.627		
627 > 80	65	4.544	4.552		1146	16	14:1	3.62 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.945	3.945	3	536456	17				1000.00	982.81	98.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.954	3.954	3/0	59996	16	>100:1	Target = 13.09		100.00	96.238		
513 > 169	51	3.945	3.954		5309	21	45:1	11.30 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.107	3	682896	18	>100:1			5000.00	5459.02	114.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.115	4.115	0/-3	10904	25	88:1	Target = 1.36	0.09	100.00	97.491		M
570 > 483	58	4.115	4.115		8472	32		1.28 (0.68-2.04)	0.10				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.267	4.267	3	526346	18	>100:1			1000.00	888.29	83.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.267	4.267	3/0	56371	19	>100:1	Target = 14.48		100.00	113.13		
563 > 169	52	4.267	4.267		4587	19	22:1	12.28 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.267	4.267	3	647090	16	>100:1			5000.00	5818.64	109.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	1/-2	11285	28	57:1	Target = 1.63	0.14	100.00	83.122		M
584 > 526	60	4.267	4.267		11115	26		1.01 (0.81-2.44)	0.23				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.318	3	79416	18	>100:1			1000.00	952.86	89.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.328	3/0	10940	14	45:1			100.00	122.27		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.338	3	51765	15	>100:1			1000.00	1026.98	102.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.347	4.347	3/0	5534	18	24:1	Target = 1.09		100.00	100.96		
512 > 219	57	4.347	4.347		5350	13	61:1	1.03 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.481	3	92317	18	>100:1			1000.00	986.65	102	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.499	4.499	3/0	9134	12	80:1			100.00	103.57		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.508	4.508	3	42856	15	>100:1			1000.00	969.17	98.7	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.517	4.517	3/0	5100	14	40:1	Target = 1.02		100.00	105.37		
526 > 219	59	4.508	4.517		5679	23	28:1	0.89 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.535	2	542630	16	>100:1			1000.00	930.31	91.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.535	4.535	2/0	56599	15	28:1	Target = 10.77		100.00	98.563		
613 > 169	38	4.535	4.535		5912	20	29:1	9.57 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.775	4.775	2/0	55020	19	>100:1	Target = 8.06		100.00	107.60		
663 > 169	38	4.775	4.775		6206	25	92:1	8.86 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.998	3	824266	20	>100:1			1000.00	921.45	91.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.998	4.998	2/-1	67339	20	12:1	Target = 11.68		100.00	101.61		
713 > 169	42	4.992	4.998		6068	36	85:1	11.09 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.390	2	828267	18	>100:1			1000.00	990.68	97.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.390	5.390	2/0	61665	19	13:1	Target = 10.53		100.00	107.25		
813 > 269	40	5.390	5.390		6253	19	>100:1	9.86 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.775	5.775	2/0	71030	23	>100:1	Target = 13.30		100.00	99.259		
913 > 319	40	5.768	5.775		5345	21	>100:1	13.28 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.954	3.954	3	623509	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.460	2	546322	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.221	3	505542	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	489211	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.593	3.593	3	124824	16	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421007.d
Injection Date: 14-Aug-2021 13:33:10 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 97
Sample Info: ID CCV 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	204.17	102.1	70 - 130
D 46 13C4_PFBA	528070	517299			98	50 - 150
D 50 13C5_PFPeA	506060	511696			101.1	50 - 150
21 PFPeA			200.00	205.18	102.6	70 - 130
7 PFBS			176.80	183.04	103.5	70 - 130
D 44 13C3_PFBS	175048	174343			99.6	50 - 150
1 4:2 FTS			186.80	228.31	122.2	70 - 130
D 63 13C2_4:2 FTS_2	96457	96714			100.3	50 - 150
D 49 13C5_PFHxA	566783	569876			100.5	50 - 150
15 PFHxA			200.00	197.63	98.8	70 - 130
22 PFPeS			187.60	182.49	97.3	70 - 130
28 GenX			400.00	425.96	106.5	70 - 130
D 66 13C3_GenX	1043199	1016416			97.4	50 - 150
D 47 13C4_PFHpA	435147	482264			110.8	50 - 150
13 PFHpA			200.00	190.53	95.3	70 - 130
D 45 13C3_PFHxS	122565	127665			104.2	50 - 150
14 PFHxS			182.00	188.05	103.3	70 - 130
29 ADONA			188.40	189.00	100.3	70 - 130
D 64 13C2_6:2 FTS_2	84328	84871			100.6	50 - 150
2 6:2 FTS			189.60	162.03	85.5	70 - 130
D 53 13C8_PFOA	471343	466115			98.9	50 - 150
20 PFOA			200.00	198.73	99.4	70 - 130
12 PFHpS			190.40	214.48	112.6	70 - 130
18 PFOS			185.60	186.61	100.5	70 - 130
D 54 13C8_PFOS	121340	127157			104.8	50 - 150
17 PFNA			200.00	201.50	100.7	70 - 130
D 56 13C9_PFNA	533018	579752			108.8	50 - 150
30 9Cl-PF3ONS			186.40	180.38	96.8	70 - 130
D 55 13C8_PFOSA	264521	251024			94.9	50 - 150
19 PFOSA			200.00	195.67	97.8	70 - 130
16 PFNS			192.00	163.55	85.2	70 - 130
D 65 13C2_8:2 FTS_2	83315	82519			99	50 - 150
3 8:2 FTS			191.60	223.29	116.5	70 - 130
10 PFDA			200.00	203.24	101.6	70 - 130
D 51 13C6_PFDA	536456	516427			96.3	50 - 150
6 N-MeFOSAA			200.00	194.44	97.2	70 - 130

Report Date: 15-Aug-2021 15:02:43 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421007.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	682896	674993			98.8	50 - 150
9 PFDS			192.80	216.88	112.5	70 - 130
D 60 d5-EtFOSAA	647090	591000			91.3	50 - 150
D 52 13C7_PFUdA	526346	574967			109.2	50 - 150
5 N-EtFOSAA			200.00	191.36	95.7	70 - 130
25 PFUdA			200.00	204.59	102.3	70 - 130
D 61 d7-MeFOSE	79416	78848			99.3	50 - 150
32 MeFOSE			200.00	200.93	100.5	70 - 130
D 57 d3-MeFOSA	51765	44020			85	50 - 150
26 MeFOSA			200.00	241.19	120.6	70 - 130
31 11Cl-PF3OUDS			188.40	178.26	94.6	70 - 130
D 62 d9-EtFOSE	92317	91447			99.1	50 - 150
33 EtFOSE			200.00	229.80	114.9	70 - 130
D 59 d5-EtFOSA	42856	42957			100.2	50 - 150
27 EtFOSA			200.00	206.51	103.3	70 - 130
11 PFDoA			200.00	201.55	100.8	70 - 130
D 38 13C2_PFDoA	542630	535743			98.7	50 - 150
4 10:2 FTS			192.80	178.97	92.8	70 - 130
34 PFDOS			193.60	199.33	103	70 - 130
24 PFTrDA			200.00	211.77	105.9	70 - 130
23 PFTeDA			200.00	195.85	97.9	70 - 130
D 42 13C2_PFTeDA	824266	831584			100.9	50 - 150
35 PFHxDA			200.00	212.57	106.3	70 - 130
D 40 13C2_PFHxDA	828267	785304			94.8	50 - 150
36 PFODA			200.00	210.45	105.2	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421007.d
Injection Date: 14-Aug-2021 13:33:10 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 97
Sample Info: ID CCV 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	1	517299	21	>100:1			1000.00	931.35	98	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.718	1/0	105556	21	>100:1			200.00	204.17		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	1	511696	17	>100:1			1000.00	983.02	101.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.098	1/0	114475	20	>100:1			200.00	205.18		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	1	174343	15	>100:1			1000.00	971.82	99.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	1/0	38048	17	>100:1	Target = 3.26		176.80	183.04		
298.9 > 99	44	2.151	2.151		10079	16	96:1	3.77 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.496	1/0	28550	18	>100:1	Target = 3.15		187.60	182.49		
349 > 99	44	2.496	2.496		10053	18	82:1	2.83 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.424	2.415	1	96714	18	>100:1			5000.00	4840.44	100.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.424	0/-1	9511	21	>100:1	Target = 1.68		186.80	228.31		
327 > 81	63	2.424	2.424		6198	21	30:1	1.53 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.460	1	569876	17	>100:1			1000.00	974.31	100.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.460	1/0	117682	18	>100:1	Target = 18.18		200.00	197.63		
313 > 119	49	2.460	2.460		4851	14	72:1	24.25 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.575	1	1016416	17	>100:1			5000.00	4720.55	97.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	1/0	60466	19	>100:1	Target = 0.79		400.00	425.96		
285 > 185	66	2.575	2.575		72361	18	>100:1	0.83 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.836	1	482264	18	>100:1			1000.00	996.97	110.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.836	1/0	102643	19	>100:1	Target = 3.65		200.00	190.53		
363 > 169	47	2.836	2.836		31375	16	>100:1	3.27 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.845	1	127665	18	>100:1			1000.00	950.77	104.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.845	1/0	26297	24	>100:1	Target = 3.10	0.14	182.00	188.05		
399 > 99	45	2.854	2.845		7734	16	56:1	3.40 (1.55-4.66)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.873	1/0	158973	18	>100:1	Target = 3.01		188.40	189.00		
377 > 85	45	2.873	2.873		50664	18	>100:1	3.13 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.221	3.221	1/0	26054	21		Target = 2.85		190.40	214.48		
449 > 99	45	3.221	3.221		9494	18	79:1	2.74 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.194	3.194	1	84871	30	>100:1			5000.00	5259.96	100.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.181	3.201	1/0	6686	14	70:1	Target = 1.74		189.60	162.03		
427 > 81	64	3.187	3.201		4796	27	60:1	1.39 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.214	3.221	0	466115	23	>100:1			1000.00	1000.67	98.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.221	3.214	1/1	92199	21	64:1	Target = 2.92		200.00	198.73		
413 > 169	53	3.214	3.214		33445	18	>100:1	2.75 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.593	3.593	1	127157	16	>100:1			1000.00	955.84	104.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.593	3.601	0/-1	26895	34	89:1	Target = 3.34		185.60	186.61		M
499 > 99	54	3.593	3.601		7925	32		3.39 (1.67-5.02)	0.27				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.798	3.806	0/-1	86987	17	>100:1			186.40	180.38		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.937	3.945	0/-1	17019	13	96:1	Target = 2.63		192.00	163.55		
549 > 99	54	3.945	3.945		7682	23	52:1	2.21 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.247	4.247	1/0	22795	23	>100:1	Target = 2.65		192.80	216.88		
599 > 99	54	4.247	4.247		6969	22	30:1	3.27 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.405	4.405	0/-1	75399	17	>100:1			188.40	178.26		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.748	4.748	1/0	18974	16	>100:1	Target = 3.08		193.60	199.33		
699 > 99	54	4.742	4.748		5942	23	>100:1	3.19 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.601	3.601	1	579752	19	>100:1			1000.00	1017.59	108.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.601	3.601	1/0	128484	23	>100:1	Target = 6.55		200.00	201.50		
463 > 169	56	3.601	3.601		16162	23	87:1	7.94 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.895	3.895	1	251024	19	>100:1			1000.00	919.81	94.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.895	3.895	1/0	55027	16	>100:1	Target = 33.36		200.00	195.67		
498>478	55	3.895	3.895		1682	14	12:1	32.71 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.945	3.937	1	82519	21				5000.00	4318.96	99	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.945	3.945	1/0	8253	12	38:1	Target = 2.44		191.60	223.29		M
527 > 81	65	3.945	3.945		4228	12	43:1	1.95 (1.22-3.67)					M
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.552	4.552	1/0	7624	15	85:1	Target = 3.72		192.80	178.97		
627 > 80	65	4.544	4.552		2696	17	16:1	2.82 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.954	3.945	1	516427	17	>100:1			1000.00	946.11	96.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.954	3.954	1/0	121975	19	>100:1	Target = 13.09		200.00	203.24		
513 > 169	51	3.954	3.954		10244	15	48:1	11.90 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.107	1	674993	18	>100:1			5000.00	5395.85	98.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.115	4.115	1/0	21496	31	>100:1	Target = 1.36		200.00	194.44		M
570 > 483	58	4.115	4.115		16753	31		1.28 (0.68-2.04)	0.22				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.267	4.267	1	574967	16	>100:1			1000.00	970.35	109.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.267	4.267	1/0	111356	17	>100:1	Target = 14.48		200.00	204.59		
563 > 169	52	4.267	4.267		7149	19	29:1	15.57 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.267	4.267	1	591000	16	>100:1			5000.00	5314.28	91.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.267	4.267	1/0	23728	35	>100:1	Target = 1.63		200.00	191.36		M
584 > 526	60	4.277	4.267		15975	28	65:1	1.48 (0.81-2.44)	0.19				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.318	1	78848	16	>100:1			1000.00	946.04	99.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.328	1/0	17849	14	>100:1			200.00	200.93		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.338	1	44020	20	>100:1			1000.00	873.32	85	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.347	4.347	1/0	11242	14	51:1	Target = 1.09		200.00	241.19		
512 > 219	57	4.347	4.347		10105	16	90:1	1.11 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.481	0	91447	15	>100:1			1000.00	977.35	99.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.499	4.499	0/0	20075	17	96:1			200.00	229.80		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.508	4.508	0	42957	17	>100:1			1000.00	971.45	100.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.517	4.517	0/0	10019	25	39:1	Target = 1.02		200.00	206.51		
526 > 219	59	4.517	4.517		9849	15	78:1	1.01 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.535	4.535	0	535743	17	>100:1			1000.00	918.50	98.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.535	4.535	0/0	114272	16	70:1	Target = 10.77		200.00	201.55		
613 > 169	38	4.544	4.535		9866	14	57:1	11.58 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.775	4.775	1/1	106911	28	>100:1	Target = 8.06		200.00	211.77		
663 > 169	38	4.775	4.775		13298	19	>100:1	8.03 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.998	4.998	1	831584	19	>100:1			1000.00	929.63	100.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.992	4.998	0/-1	130942	20	23:1	Target = 11.68		200.00	195.85		
713 > 169	42	4.998	4.998		11742	18	>100:1	11.15 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.390	5.390	1	785304	17	>100:1			1000.00	939.30	94.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.390	5.390	1/0	115873	19	27:1	Target = 10.53		200.00	212.57		
813 > 269	40	5.390	5.390		10463	15	>100:1	11.07 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.768	5.775	0/-1	142785	23	13:1	Target = 13.30		200.00	210.45		
913 > 319	40	5.768	5.775		10003	21	>100:1	14.27 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.945	3.954	0	599685	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.460	1	565107	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.221	1	488305	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	1	499649	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.593	3.593	1	135055	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421025.d
Injection Date: 14-Aug-2021 16:44:25 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 17
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1021.46	102.1	70 - 130
D 46 13C4_PFBA	528070	512053			97	50 - 150
D 50 13C5_PFPeA	506060	487870			96.4	50 - 150
21 PFPeA			1000.00	1010.66	101.1	70 - 130
7 PFBS			884.00	890.88	100.8	70 - 130
D 44 13C3_PFBS	175048	171525			98	50 - 150
1 4:2 FTS			934.00	970.75	103.9	70 - 130
D 63 13C2_4:2 FTS_2	96457	94937			98.4	50 - 150
D 49 13C5_PFHxA	566783	561458			99.1	50 - 150
15 PFHxA			1000.00	978.33	97.8	70 - 130
22 PFPeS			938.00	870.90	92.8	70 - 130
28 GenX			2000.00	1947.79	97.4	70 - 130
D 66 13C3_GenX	1043199	1031151			98.8	50 - 150
D 47 13C4_PFHpA	435147	462562			106.3	50 - 150
13 PFHpA			1000.00	971.06	97.1	70 - 130
D 45 13C3_PFHxS	122565	129726			105.8	50 - 150
14 PFHxS			910.00	880.26	96.7	70 - 130
29 ADONA			942.00	923.21	98	70 - 130
D 64 13C2_6:2 FTS_2	84328	82374			97.7	50 - 150
2 6:2 FTS			948.00	976.19	103	70 - 130
D 53 13C8_PFOA	471343	482729			102.4	50 - 150
20 PFOA			1000.00	914.44	91.4	70 - 130
12 PFHpS			952.00	1031.82	108.4	70 - 130
18 PFOS			928.00	890.89	96	70 - 130
D 54 13C8_PFOS	121340	131623			108.5	50 - 150
17 PFNA			1000.00	989.21	98.9	70 - 130
D 56 13C9_PFNA	533018	526557			98.8	50 - 150
30 9Cl-PF3ONS			932.00	921.67	98.9	70 - 130
D 55 13C8_PFOSA	264521	258889			97.9	50 - 150
19 PFOSA			1000.00	989.92	99	70 - 130
16 PFNS			960.00	984.53	102.6	70 - 130
D 65 13C2_8:2 FTS_2	83315	88563			106.3	50 - 150
3 8:2 FTS			958.00	1056.27	110.3	70 - 130
10 PFDA			1000.00	948.46	94.8	70 - 130
D 51 13C6_PFDA	536456	539288			100.5	50 - 150
6 N-MeFOSAA			1000.00	1099.15	109.9	70 - 130

Report Date: 15-Aug-2021 15:02:46 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421025.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	682896	663820			97.2	50 - 150
9 PFDS			964.00	921.95	95.6	70 - 130
D 60 d5-EtFOSAA	647090	621102			96	50 - 150
D 52 13C7_PFUdA	526346	520915			99	50 - 150
5 N-EtFOSAA			1000.00	929.90	93	70 - 130
25 PFUdA			1000.00	1055.42	105.5	70 - 130
D 61 d7-MeFOSE	79416	84784			106.8	50 - 150
32 MeFOSE			1000.00	956.35	95.6	70 - 130
D 57 d3-MeFOSA	51765	49460			95.5	50 - 150
26 MeFOSA			1000.00	1091.08	109.1	70 - 130
31 11Cl-PF3OUDS			942.00	885.48	94	70 - 130
D 62 d9-EtFOSE	92317	88232			95.6	50 - 150
33 EtFOSE			1000.00	1114.97	111.5	70 - 130
D 59 d5-EtFOSA	42856	42781			99.8	50 - 150
27 EtFOSA			1000.00	930.57	93.1	70 - 130
11 PFDoA			1000.00	1054.28	105.4	70 - 130
D 38 13C2_PFDoA	542630	518934			95.6	50 - 150
4 10:2 FTS			964.00	944.10	97.9	70 - 130
34 PFDOS			968.00	914.21	94.4	70 - 130
24 PFTrDA			1000.00	1008.12	100.8	70 - 130
23 PFTeDA			1000.00	1034.12	103.4	70 - 130
D 42 13C2_PFTeDA	824266	805429			97.7	50 - 150
35 PFHxDA			1000.00	980.08	98	70 - 130
D 40 13C2_PFHxDA	828267	853609			103.1	50 - 150
36 PFODA			1000.00	960.75	96.1	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421025.d
Injection Date: 14-Aug-2021 16:44:25 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 17
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.711	1	512053	21	>100:1			1000.00	921.91	97	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.718	1/0	522746	22	>100:1			1000.00	1021.46		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	1	487870	17	>100:1			1000.00	937.25	96.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.098	1/0	537615	15	>100:1			1000.00	1010.66		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	1	171525	15	>100:1			1000.00	956.12	98	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	1/0	182188	15	>100:1	Target = 3.26		884.00	890.88		
298.9 > 99	44	2.151	2.151		54225	15	>100:1	3.35 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.496	1/0	134047	18	>100:1	Target = 3.15		938.00	870.90		
349 > 99	44	2.487	2.496		51596	16	>100:1	2.59 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.415	1	94937	17	>100:1			5000.00	4751.51	98.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.424	0/-1	39696	19	>100:1	Target = 1.68		934.00	970.75		
327 > 81	63	2.416	2.424		23763	21	>100:1	1.67 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.460	1	561458	17	>100:1			1000.00	959.92	99.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.460	1/0	573959	17	>100:1	Target = 18.18		1000.00	978.33		
313 > 119	49	2.460	2.460		28945	17	>100:1	19.82 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.575	1	1031151	19	>100:1			5000.00	4788.98	98.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	1/0	280502	19	>100:1	Target = 0.79		2000.00	1947.79		
285 > 185	66	2.575	2.575		357726	19	>100:1	0.78 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.836	1	462562	17	>100:1			1000.00	956.24	106.3	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.836	1/0	501761	18	>100:1	Target = 3.65		1000.00	971.06		
363 > 169	47	2.836	2.836		139641	17	>100:1	3.59 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.845	1	129726	17				1000.00	966.12	105.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.845	1/0	125080	26	>100:1	Target = 3.10	0.18	910.00	880.26		
399 > 99	45	2.855	2.845		43492	23	>100:1	2.87 (1.55-4.66)	0.12				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.873	1/0	789072	20	>100:1	Target = 3.01		942.00	923.21		
377 > 85	45	2.873	2.873		254273	18	>100:1	3.10 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.226	3.221	1/0	127365	22		Target = 2.85		952.00	1031.82		
449 > 99	45	3.226	3.221		41258	20	>100:1	3.08 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.193	3.194	0	82374	21				5000.00	5105.20	97.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.193	3.201	0/0	39096	22		Target = 1.74		948.00	976.19		
427 > 81	64	3.193	3.201		24346	24	>100:1	1.60 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.213	3.221	0	482729	22	>100:1			1000.00	1036.33	102.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.220	3.214	1/1	439363	19	>100:1	Target = 2.92		1000.00	914.44		
413 > 169	53	3.213	3.214		159883	21	>100:1	2.74 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.592	3.593	0	131623	18	>100:1			1000.00	989.41	108.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.600	3.601	0/0	132912	37	>100:1	Target = 3.34	0.25	928.00	890.89		
499 > 99	54	3.600	3.601		37835	29	47:1	3.51 (1.67-5.02)	0.09				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.804	3.806	0/0	460084	18	>100:1			932.00	921.67		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.943	3.945	0/0	106050	16	>100:1	Target = 2.63		960.00	984.53		
549 > 99	54	3.943	3.945		40879	17	>100:1	2.59 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.244	4.247	0/0	100304	16		Target = 2.65		964.00	921.95		
599 > 99	54	4.244	4.247		35002	22	>100:1	2.86 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.403	4.405	0/0	387694	17	>100:1			942.00	885.48		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.753	4.748	1/1	90078	19	>100:1	Target = 3.08		968.00	914.21		
699 > 99	54	4.753	4.748		29689	19	>100:1	3.03 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.600	3.601	0	526557	19	>100:1			1000.00	924.22	98.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.600	3.601	0/0	572898	19	>100:1	Target = 6.55		1000.00	989.21		
463 > 169	56	3.600	3.601		88028	18	>100:1	6.50 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.885	3.895	0	258889	17	>100:1			1000.00	948.63	97.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.893	3.895	0/0	287108	19	>100:1	Target = 33.36		1000.00	989.92		
498>478	55	3.885	3.895		8670	22		33.11 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.943	3.937	1	88563	16	>100:1			5000.00	4635.30	106.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.943	3.945	0/-1	41901	16	>100:1	Target = 2.44		958.00	1056.27		
527 > 81	65	3.943	3.945		22268	22	>100:1	1.88 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.550	4.552	0/-1	43164	16	>100:1	Target = 3.72		964.00	944.10		
627 > 80	65	4.550	4.552		10713	14	88:1	4.02 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.952	3.945	1	539288	17	>100:1			1000.00	988.00	100.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.952	3.954	0/-1	594406	18	>100:1	Target = 13.09		1000.00	948.46		
513 > 169	51	3.952	3.954		46635	16	>100:1	12.74 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.113	4.107	1	663820	18	>100:1			5000.00	5306.53	97.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.113	4.115	0/-1	119501	32		Target = 1.36	0.06	1000.00	1099.15		M
570 > 483	58	4.113	4.115		85147	30		1.40 (0.68-2.04)	0.26				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.265	4.267	0	520915	15	>100:1			1000.00	879.12	99	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.265	4.267	0/0	520457	15	>100:1	Target = 14.48		1000.00	1055.42		
563 > 169	52	4.265	4.267		35054	15	>100:1	14.84 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.265	4.267	0	621102	16	>100:1			5000.00	5584.96	96	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.275	4.267	1/1	121177	35	>100:1	Target = 1.63		1000.00	929.90		M
584 > 526	60	4.275	4.267		74864	30	>100:1	1.61 (0.81-2.44)	0.19				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.315	4.318	0	84784	14	>100:1			1000.00	1017.27	106.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.325	4.328	0/0	91350	16	>100:1			1000.00	956.35		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.335	4.338	0	49460	14	>100:1			1000.00	981.25	95.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.345	4.347	0/0	57141	15	>100:1	Target = 1.09		1000.00	1091.08		
512 > 219	57	4.335	4.347		43556	17	>100:1	1.31 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.479	4.481	0	88232	15	>100:1			1000.00	942.99	95.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.497	4.499	0/0	93977	15	>100:1			1000.00	1114.97		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.506	4.508	0	42781	13	>100:1			1000.00	967.47	99.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.506	4.517	0/0	44962	13	>100:1	Target = 1.02		1000.00	930.57		
526 > 219	59	4.506	4.517		53973	17	>100:1	0.83 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.541	4.535	1	518934	16	>100:1			1000.00	889.68	95.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.541	4.535	1/0	578976	17	>100:1	Target = 10.77		1000.00	1054.28		
613 > 169	38	4.541	4.535		56078	17	>100:1	10.32 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.780	4.775	1/0	492973	20	>100:1	Target = 8.06		1000.00	1008.12		
663 > 169	38	4.780	4.775		63894	19	>100:1	7.71 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.003	4.998	1	805429	19	>100:1			1000.00	900.40	97.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.003	4.998	1/0	669650	20	>100:1	Target = 11.68		1000.00	1034.12		
713 > 169	42	4.997	4.998		59547	20	>100:1	11.24 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.395	5.390	1	853609	18	>100:1			1000.00	1020.99	103.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.395	5.390	1/0	580727	19	>100:1	Target = 10.53		1000.00	980.08		
813 > 269	40	5.395	5.390		56532	16	>100:1	10.27 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.780	5.775	1/0	708553	24	79:1	Target = 13.30		1000.00	960.75		
913 > 319	40	5.773	5.775		57822	32	>100:1	12.25 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.952	3.954	0	633130	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.460	1	592234	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.213	3.221	0	474693	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	1	478992	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.592	3.593	0	137781	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421039.d
Injection Date: 14-Aug-2021 19:13:39 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1010.59	101.1	70 - 130
D 46 13C4_PFBA	528070	533953			101.1	50 - 150
D 50 13C5_PFPeA	506060	517987			102.4	50 - 150
21 PFPeA			1000.00	1000.46	100	70 - 130
7 PFBS			884.00	908.84	102.8	70 - 130
D 44 13C3_PFBS	175048	175211			100.1	50 - 150
1 4:2 FTS			934.00	954.49	102.2	70 - 130
D 63 13C2_4:2 FTS_2	96457	97517			101.1	50 - 150
D 49 13C5_PFHxA	566783	572249			101	50 - 150
15 PFHxA			1000.00	1011.61	101.2	70 - 130
22 PFPeS			938.00	925.74	98.7	70 - 130
28 GenX			2000.00	1933.76	96.7	70 - 130
D 66 13C3_GenX	1043199	1059915			101.6	50 - 150
D 47 13C4_PFHpA	435147	489915			112.6	50 - 150
13 PFHpA			1000.00	989.09	98.9	70 - 130
D 45 13C3_PFHxS	122565	132221			107.9	50 - 150
14 PFHxS			910.00	947.07	104.1	70 - 130
29 ADONA			942.00	967.03	102.7	70 - 130
D 64 13C2_6:2 FTS_2	84328	88411			104.8	50 - 150
2 6:2 FTS			948.00	875.19	92.3	70 - 130
D 53 13C8_PFOA	471343	465698			98.8	50 - 150
20 PFOA			1000.00	1026.38	102.6	70 - 130
12 PFHpS			952.00	999.80	105	70 - 130
18 PFOS			928.00	1003.05	108.1	70 - 130
D 54 13C8_PFOS	121340	126523			104.3	50 - 150
17 PFNA			1000.00	1015.66	101.6	70 - 130
D 56 13C9_PFNA	533018	556221			104.4	50 - 150
30 9Cl-PF3ONS			932.00	942.10	101.1	70 - 130
D 55 13C8_PFOSA	264521	266149			100.6	50 - 150
19 PFOSA			1000.00	972.04	97.2	70 - 130
16 PFNS			960.00	982.26	102.3	70 - 130
D 65 13C2_8:2 FTS_2	83315	92446			111	50 - 150
3 8:2 FTS			958.00	985.41	102.9	70 - 130
10 PFDA			1000.00	963.63	96.4	70 - 130
D 51 13C6_PFDA	536456	558727			104.2	50 - 150
6 N-MeFOSAA			1000.00	898.42	89.8	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	682896	731936			107.2	50 - 150
9 PFDS			964.00	944.94	98	70 - 130
D 60 d5-EtFOSAA	647090	630860			97.5	50 - 150
D 52 13C7_PFUdA	526346	564830			107.3	50 - 150
5 N-EtFOSAA			1000.00	988.12	98.8	70 - 130
25 PFUdA			1000.00	1012.35	101.2	70 - 130
D 61 d7-MeFOSE	79416	84335			106.2	50 - 150
32 MeFOSE			1000.00	1031.79	103.2	70 - 130
D 57 d3-MeFOSA	51765	49232			95.1	50 - 150
26 MeFOSA			1000.00	1069.28	106.9	70 - 130
31 11Cl-PF3OUDS			942.00	971.95	103.2	70 - 130
D 62 d9-EtFOSE	92317	97280			105.4	50 - 150
33 EtFOSE			1000.00	1061.60	106.2	70 - 130
D 59 d5-EtFOSA	42856	46682			108.9	50 - 150
27 EtFOSA			1000.00	1005.38	100.5	70 - 130
11 PFDoA			1000.00	1040.37	104	70 - 130
D 38 13C2_PFDoA	542630	535548			98.7	50 - 150
4 10:2 FTS			964.00	871.25	90.4	70 - 130
34 PFDOS			968.00	983.42	101.6	70 - 130
24 PFTrDA			1000.00	1057.70	105.8	70 - 130
23 PFTeDA			1000.00	1030.45	103	70 - 130
D 42 13C2_PFTeDA	824266	828149			100.5	50 - 150
35 PFHxDA			1000.00	1028.83	102.9	70 - 130
D 40 13C2_PFHxDA	828267	845343			102.1	50 - 150
36 PFODA			1000.00	988.64	98.9	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421039.d
Injection Date: 14-Aug-2021 19:13:39 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.717	1.711	1	533953	21	>100:1			1000.00	961.34	101.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.717	1.718	0/-1	539300	20	>100:1			1000.00	1010.59		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.097	2.088	1	517987	15	>100:1			1000.00	995.11	102.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.097	2.098	0/-1	565039	15	>100:1			1000.00	1000.46		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.150	2.151	0	175211	16	>100:1			1000.00	976.66	100.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.161	2.151	1/1	189856	14	>100:1	Target = 3.26		884.00	908.84		
298.9 > 99	44	2.161	2.151		54688	15	>100:1	3.47 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.504	2.496	1/1	145551	17	>100:1	Target = 3.15		938.00	925.74		
349 > 99	44	2.495	2.496		49156	15	>100:1	2.96 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.423	2.415	1	97517	16	>100:1			5000.00	4880.63	101.1	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.423	2.424	0/-1	40092	17		Target = 1.68		934.00	954.49		
327 > 81	63	2.423	2.424		23385	19	>100:1	1.71 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.468	2.460	1	572249	17	>100:1			1000.00	978.37	101	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.468	2.460	1/0	604892	19	>100:1	Target = 18.18		1000.00	1011.61		
313 > 119	49	2.468	2.460		32248	17	>100:1	18.75 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.582	2.575	1	1059915	19	>100:1			5000.00	4922.57	101.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.582	2.575	1/0	286249	17	>100:1	Target = 0.79		2000.00	1933.76		
285 > 185	66	2.582	2.575		355836	19	>100:1	0.80 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.844	2.836	1	489915	18	>100:1			1000.00	1012.78	112.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.844	2.836	1/0	541303	18	>100:1	Target = 3.65		1000.00	989.09		
363 > 169	47	2.844	2.836		143254	17	>100:1	3.77 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.853	2.845	1	132221	19				1000.00	984.70	107.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.853	2.845	1/0	137162	25	>100:1	Target = 3.10	0.19	910.00	947.07		
399 > 99	45	2.853	2.845		42707	25	>100:1	3.21 (1.55-4.66)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.879	2.873	1/0	842416	18	>100:1	Target = 3.01		942.00	967.03		
377 > 85	45	2.879	2.873		257159	20	>100:1	3.27 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.232	3.221	1/0	125786	20	>100:1	Target = 2.85		952.00	999.80		
449 > 99	45	3.232	3.221		44517	20	>100:1	2.82 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.205	3.194	1	88411	20	>100:1			5000.00	5479.35	104.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.205	3.201	1/0	37620	22	>100:1	Target = 1.74		948.00	875.19		
427 > 81	64	3.198	3.201		23096	21		1.62 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.225	3.221	1	465698	21	>100:1			1000.00	999.77	98.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.225	3.214	1/0	475749	20	>100:1	Target = 2.92		1000.00	1026.38		
413 > 169	53	3.225	3.214		176377	20	>100:1	2.69 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.606	3.593	1	126523	20	>100:1			1000.00	951.07	104.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.606	3.601	1/0	143846	42	>100:1	Target = 3.34	0.25	928.00	1003.05		
499 > 99	54	3.606	3.601		39871	33	>100:1	3.60 (1.67-5.02)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.810	3.806	1/0	452061	20	>100:1			932.00	942.10		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.950	3.945	1/0	101706	16	>100:1	Target = 2.63		960.00	982.26		
549 > 99	54	3.950	3.945		37895	16	>100:1	2.68 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.250	4.247	1/0	98822	15	>100:1	Target = 2.65		964.00	944.94		
599 > 99	54	4.250	4.247		39385	15	>100:1	2.50 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.415	4.405	1/0	409062	17	>100:1			942.00	971.95		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.758	4.748	1/0	93143	18	>100:1	Target = 3.08		968.00	983.42		
699 > 99	54	4.758	4.748		30097	18	>100:1	3.09 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.606	3.601	1	556221	17	>100:1			1000.00	976.29	104.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.614	3.601	1/0	621354	19	>100:1	Target = 6.55		1000.00	1015.66		
463 > 169	56	3.614	3.601		101505	19	>100:1	6.12 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.900	3.895	1	266149	20	>100:1			1000.00	975.23	100.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.900	3.895	1/0	289829	18	>100:1	Target = 33.36		1000.00	972.04		
498>478	55	3.900	3.895		10559	23		27.44 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.950	3.937	1	92446	17				5000.00	4838.53	111	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.959	3.945	1/0	40804	17	>100:1	Target = 2.44		958.00	985.41		
527 > 81	65	3.950	3.945		20605	18	>100:1	1.98 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.556	4.552	1/0	41580	25		Target = 3.72		964.00	871.25		
627 > 80	65	4.556	4.552		12627	14	>100:1	3.29 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.959	3.945	1	558727	18	>100:1			1000.00	1023.61	104.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.959	3.954	1/0	625684	17	>100:1	Target = 13.09		1000.00	963.63		
513 > 169	51	3.959	3.954		45601	15	>100:1	13.72 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.118	4.107	1	731936	17	>100:1			5000.00	5851.05	107.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.127	4.115	1/0	107700	32	>100:1	Target = 1.36	0.09	1000.00	898.42		M
570 > 483	58	4.127	4.115		90088	31	>100:1	1.19 (0.68-2.04)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.270	4.267	1	564830	16	>100:1			1000.00	953.24	107.3	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.280	4.267	1/0	541304	16	>100:1	Target = 14.48		1000.00	1012.35		
563 > 169	52	4.270	4.267		38481	14	>100:1	14.06 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.280	4.267	1	630860	17	>100:1			5000.00	5672.70	97.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.280	4.267	1/0	130787	31	>100:1	Target = 1.63		1000.00	988.12		M
584 > 526	60	4.280	4.267		81193	30	>100:1	1.61 (0.81-2.44)	0.20				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.320	4.318	1	84335	15	>100:1			1000.00	1011.88	106.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.330	4.328	1/0	98034	14	>100:1			1000.00	1031.79		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.340	4.338	1	49232	15	>100:1			1000.00	976.72	95.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.349	4.347	1/0	55741	15	>100:1	Target = 1.09		1000.00	1069.28		
512 > 219	57	4.340	4.347		54204	22	>100:1	1.02 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.485	4.481	1	97280	16	>100:1			1000.00	1039.69	105.4	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.503	4.499	1/0	98654	16	>100:1			1000.00	1061.60		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.503	4.508	0	46682	22	>100:1			1000.00	1055.69	108.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.512	4.517	0/0	53006	15	>100:1	Target = 1.02		1000.00	1005.38		
526 > 219	59	4.512	4.517		47207	15	>100:1	1.12 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.548	4.535	1	535548	17	>100:1			1000.00	918.17	98.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.548	4.535	1/0	589627	16	>100:1	Target = 10.77		1000.00	1040.37		
613 > 169	38	4.548	4.535		54597	18	>100:1	10.79 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.791	4.775	1/0	533781	20	>100:1	Target = 8.06		1000.00	1057.70		
663 > 169	38	4.785	4.775		65327	20	>100:1	8.17 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.008	4.998	1	828149	20	>100:1			1000.00	925.79	100.5	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.008	4.998	1/0	686100	20	>100:1	Target = 11.68		1000.00	1030.45		
713 > 169	42	5.008	4.998		61641	20	>100:1	11.13 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.402	5.390	1	845343	18	>100:1			1000.00	1011.11	102.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.411	5.390	2/1	603708	18	>100:1	Target = 10.53		1000.00	1028.83		
813 > 269	40	5.411	5.390		56792	18	>100:1	10.63 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.793	5.775	2/1	722056	24	77:1	Target = 13.30		1000.00	988.64		
913 > 319	40	5.786	5.775		58754	26	>100:1	12.28 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.959	3.954	1	636568	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.468	2.460	1	559283	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.232	3.221	1	502358	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.717	1.711	1	501815	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.606	3.593	1	133734	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421051.d
Injection Date: 14-Aug-2021 21:21:24 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 43
Sample Info: ID CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1026.76	102.7	70 - 130
D 46 13C4_PFBA	528070	550226			104.2	50 - 150
D 50 13C5_PFPeA	506060	538519			106.4	50 - 150
21 PFPeA			1000.00	961.98	96.2	70 - 130
7 PFBS			884.00	907.33	102.6	70 - 130
D 44 13C3_PFBS	175048	181815			103.9	50 - 150
1 4:2 FTS			934.00	1028.17	110.1	70 - 130
D 63 13C2_4:2 FTS_2	96457	93986			97.4	50 - 150
D 49 13C5_PFHxA	566783	598201			105.5	50 - 150
15 PFHxA			1000.00	974.37	97.4	70 - 130
22 PFPeS			938.00	951.00	101.4	70 - 130
28 GenX			2000.00	1765.83	88.3	70 - 130
D 66 13C3_GenX	1043199	1149481			110.2	50 - 150
D 47 13C4_PFHpA	435147	478540			110	50 - 150
13 PFHpA			1000.00	985.52	98.6	70 - 130
D 45 13C3_PFHxS	122565	133918			109.3	50 - 150
14 PFHxS			910.00	965.11	106.1	70 - 130
29 ADONA			942.00	956.49	101.5	70 - 130
D 64 13C2_6:2 FTS_2	84328	87692			104	50 - 150
2 6:2 FTS			948.00	931.39	98.2	70 - 130
D 53 13C8_PFOA	471343	463604			98.4	50 - 150
20 PFOA			1000.00	1061.02	106.1	70 - 130
12 PFHpS			952.00	982.36	103.2	70 - 130
18 PFOS			928.00	907.79	97.8	70 - 130
D 54 13C8_PFOS	121340	133954			110.4	50 - 150
17 PFNA			1000.00	1029.19	102.9	70 - 130
D 56 13C9_PFNA	533018	560480			105.2	50 - 150
30 9Cl-PF3ONS			932.00	896.31	96.2	70 - 130
D 55 13C8_PFOSA	264521	266304			100.7	50 - 150
19 PFOSA			1000.00	1010.89	101.1	70 - 130
16 PFNS			960.00	973.83	101.4	70 - 130
D 65 13C2_8:2 FTS_2	83315	93397			112.1	50 - 150
3 8:2 FTS			958.00	1054.04	110	70 - 130
10 PFDA			1000.00	945.97	94.6	70 - 130
D 51 13C6_PFDA	536456	568138			105.9	50 - 150
6 N-MeFOSAA			1000.00	946.65	94.7	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	682896	709241			103.9	50 - 150
9 PFDS			964.00	989.33	102.6	70 - 130
D 60 d5-EtFOSAA	647090	656645			101.5	50 - 150
D 52 13C7_PFUdA	526346	588912			111.9	50 - 150
5 N-EtFOSAA			1000.00	980.88	98.1	70 - 130
25 PFUdA			1000.00	975.53	97.6	70 - 130
D 61 d7-MeFOSE	79416	96509			121.5	50 - 150
32 MeFOSE			1000.00	908.73	90.9	70 - 130
D 57 d3-MeFOSA	51765	52991			102.4	50 - 150
26 MeFOSA			1000.00	1029.96	103	70 - 130
31 11Cl-PF3OUDS			942.00	925.92	98.3	70 - 130
D 62 d9-EtFOSE	92317	104734			113.5	50 - 150
33 EtFOSE			1000.00	1056.39	105.6	70 - 130
D 59 d5-EtFOSA	42856	49343			115.1	50 - 150
27 EtFOSA			1000.00	937.34	93.7	70 - 130
11 PFDoA			1000.00	1030.93	103.1	70 - 130
D 38 13C2_PFDoA	542630	540900			99.7	50 - 150
4 10:2 FTS			964.00	793.00	82.3	70 - 130
34 PFDOS			968.00	969.90	100.2	70 - 130
24 PFTrDA			1000.00	1003.52	100.4	70 - 130
23 PFTeDA			1000.00	1023.82	102.4	70 - 130
D 42 13C2_PFTeDA	824266	838070			101.7	50 - 150
35 PFHxDA			1000.00	1029.66	103	70 - 130
D 40 13C2_PFHxDA	828267	845323			102.1	50 - 150
36 PFODA			1000.00	999.98	100	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421051.d
Injection Date: 14-Aug-2021 21:21:24 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 43
Sample Info: ID CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.722	1.711	1	550226	21	>100:1			1000.00	990.63	104.2	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.722	1.718	1/0	564628	20	>100:1			1000.00	1026.76		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.094	2.088	1	538519	15	>100:1			1000.00	1034.55	106.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.094	2.098	0/-1	564845	15	>100:1			1000.00	961.98		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.146	2.151	0	181815	14	>100:1			1000.00	1013.47	103.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.146	2.151	0/0	196683	16	>100:1	Target = 3.26		884.00	907.33		
298.9 > 99	44	2.146	2.151		55820	14	>100:1	3.52 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.486	2.496	0/0	155157	17	>100:1	Target = 3.15		938.00	951.00		
349 > 99	44	2.486	2.496		48938	16	>100:1	3.17 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.415	0	93986	17	>100:1			5000.00	4703.91	97.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.415	2.424	0/0	41623	18	>100:1	Target = 1.68		934.00	1028.17		
327 > 81	63	2.415	2.424		25948	16	>100:1	1.60 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.450	2.460	0	598201	17	>100:1			1000.00	1022.74	105.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.450	2.460	0/0	609050	18	>100:1	Target = 18.18		1000.00	974.37		
313 > 119	49	2.450	2.460		33960	17	>100:1	17.93 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.566	2.575	0	1149481	19	>100:1			5000.00	5338.54	110.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.566	2.575	0/0	283480	18	>100:1	Target = 0.79		2000.00	1765.83		
285 > 185	66	2.566	2.575		383501	18	>100:1	0.73 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.836	0	478540	17	>100:1			1000.00	989.27	110	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.826	2.836	0/0	526825	17	>100:1	Target = 3.65		1000.00	985.52		
363 > 169	47	2.826	2.836		152557	17	>100:1	3.45 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.845	0	133918	16	>100:1			1000.00	997.34	109.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.845	0/0	141569	25	>100:1	Target = 3.10	0.17	910.00	965.11		
399 > 99	45	2.845	2.845		42653	25	>100:1	3.31 (1.55-4.66)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.873	0/0	843932	20	>100:1	Target = 3.01		942.00	956.49		
377 > 85	45	2.854	2.873		266078	18		3.17 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.212	3.221	0/0	125178	20	>100:1	Target = 2.85		952.00	982.36		
449 > 99	45	3.212	3.221		46944	25	>100:1	2.66 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.179	3.194	0	87692	21	>100:1			5000.00	5434.79	104	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.179	3.201	-1/-1	39710	21	>100:1	Target = 1.74		948.00	931.39		
427 > 81	64	3.179	3.201		21638	20	>100:1	1.83 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.221	0	463604	21	>100:1			1000.00	995.28	98.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.205	3.214	0/0	489594	21	>100:1	Target = 2.92		1000.00	1061.02		
413 > 169	53	3.205	3.214		178494	21	>100:1	2.74 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.582	3.593	0	133954	19	>100:1			1000.00	1006.93	110.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.582	3.601	-1/-1	137831	36	>100:1	Target = 3.34	0.28	928.00	907.79		
499 > 99	54	3.574	3.601		41310	36	>100:1	3.33 (1.67-5.02)	0.16				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.787	3.806	-1/-1	455349	20	>100:1			932.00	896.31		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.917	3.945	-1/-1	106755	21	>100:1	Target = 2.63		960.00	973.83		
549 > 99	54	3.917	3.945		40207	17	>100:1	2.65 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.221	4.247	-1/-1	109541	14	>100:1	Target = 2.65		964.00	989.33		
599 > 99	54	4.221	4.247		42281	15	>100:1	2.59 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.378	4.405	-1/-1	412578	17	>100:1			942.00	925.92		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.732	4.748	0/0	97258	19	>100:1	Target = 3.08		968.00	969.90		
699 > 99	54	4.725	4.748		30858	19	>100:1	3.15 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.582	3.601	-1	560480	19	>100:1			1000.00	983.76	105.2	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.582	3.601	-1/0	634452	20	>100:1	Target = 6.55		1000.00	1029.19		
463 > 169	56	3.582	3.601		100300	18	>100:1	6.32 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.868	3.895	-1	266304	17	>100:1			1000.00	975.80	100.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.876	3.895	-1/0	301590	17	>100:1	Target = 33.36		1000.00	1010.89		
498>478	55	3.868	3.895		11309	23	66:1	26.66 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.926	3.937	0	93397	17	>100:1			5000.00	4888.31	112.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.926	3.945	-1/-1	44095	19	>100:1	Target = 2.44		958.00	1054.04		
527 > 81	65	3.926	3.945		21017	14		2.09 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.522	4.552	-1/-1	38235	18		Target = 3.72		964.00	793.00		
627 > 80	65	4.522	4.552		14110	16	93:1	2.70 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.934	3.945	0	568138	18	>100:1			1000.00	1040.85	105.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.934	3.954	-1/-1	624563	17	>100:1	Target = 13.09		1000.00	945.97		
513 > 169	51	3.934	3.954		49425	18	>100:1	12.63 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.093	4.107	0	709241	18	>100:1			5000.00	5669.62	103.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.093	4.115	-1/-1	109963	30	>100:1	Target = 1.36	0.08	1000.00	946.65		M
570 > 483	58	4.093	4.115		76212	28	>100:1	1.44 (0.68-2.04)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.242	4.267	-1	588912	16	>100:1			1000.00	993.88	111.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.242	4.267	-1/0	543852	15	>100:1	Target = 14.48		1000.00	975.53		
563 > 169	52	4.252	4.267		40755	22	>100:1	13.34 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.242	4.267	-1	656645	16	>100:1			5000.00	5904.56	101.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.252	4.267	0/1	135135	31		Target = 1.63	0.07	1000.00	980.88		M
584 > 526	60	4.252	4.267		82969	30	>100:1	1.62 (0.81-2.44)	0.12				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.292	4.318	-1	96509	20	>100:1			1000.00	1157.95	121.5	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.302	4.328	-1/0	98806	15	>100:1			1000.00	908.73		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.313	4.338	-1	52991	14	>100:1			1000.00	1051.30	102.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.313	4.347	-2/-1	57791	17	>100:1	Target = 1.09		1000.00	1029.96		
512 > 219	57	4.313	4.347		48298	13	>100:1	1.19 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.459	4.481	-1	104734	15	>100:1			1000.00	1119.36	113.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.468	4.499	-1/0	105692	15	>100:1			1000.00	1056.39		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.477	4.508	-1	49343	15	>100:1			1000.00	1115.87	115.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.477	4.517	-2/-1	52236	13	>100:1	Target = 1.02		1000.00	937.34		
526 > 219	59	4.486	4.517		50245	18	>100:1	1.03 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.513	4.535	-1	540900	17	>100:1			1000.00	927.34	99.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.513	4.535	-1/0	590119	16	>100:1	Target = 10.77		1000.00	1030.93		
613 > 169	38	4.513	4.535		60293	16	>100:1	9.78 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.752	4.775	-1/0	511497	19	>100:1	Target = 8.06		1000.00	1003.52		
663 > 169	38	4.759	4.775		63733	18	>100:1	8.02 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.978	4.998	-1	838070	20	>100:1			1000.00	936.89	101.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.978	4.998	-1/0	689848	20	>100:1	Target = 11.68		1000.00	1023.82		
713 > 169	42	4.978	4.998		59783	19	>100:1	11.53 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.377	5.390	0	845323	19	>100:1			1000.00	1011.08	102.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.377	5.390	0/0	604181	18	>100:1	Target = 10.53		1000.00	1029.66		
813 > 269	40	5.377	5.390		59002	19	>100:1	10.24 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.765	5.775	0/0	730326	23	73:1	Target = 13.30		1000.00	999.98		
913 > 319	40	5.765	5.775		57889	23	>100:1	12.61 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.934	3.954	-1	655726	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.450	2.460	0	591352	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.221	0	508381	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.722	1.711	1	520810	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.574	3.593	-1	137965	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421067.d
Injection Date: 15-Aug-2021 00:11:47 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 59
Sample Info: ID CCV 1000C_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1029.40	102.9	70 - 130
D 46 13C4_PFBA	528070	508734			96.3	50 - 150
D 50 13C5_PFPeA	506060	502493			99.3	50 - 150
21 PFPeA			1000.00	996.17	99.6	70 - 130
7 PFBS			884.00	866.63	98	70 - 130
D 44 13C3_PFBS	175048	171197			97.8	50 - 150
1 4:2 FTS			934.00	950.33	101.7	70 - 130
D 63 13C2_4:2 FTS_2	96457	93266			96.7	50 - 150
D 49 13C5_PFHxA	566783	539383			95.2	50 - 150
15 PFHxA			1000.00	1000.54	100.1	70 - 130
22 PFPeS			938.00	897.15	95.6	70 - 130
28 GenX			2000.00	1848.12	92.4	70 - 130
D 66 13C3_GenX	1043199	1045604			100.2	50 - 150
D 47 13C4_PFHpA	435147	432880			99.5	50 - 150
13 PFHpA			1000.00	1038.60	103.9	70 - 130
D 45 13C3_PFHxS	122565	120124			98	50 - 150
14 PFHxS			910.00	1001.17	110	70 - 130
29 ADONA			942.00	995.84	105.7	70 - 130
D 64 13C2_6:2 FTS_2	84328	81539			96.7	50 - 150
2 6:2 FTS			948.00	1012.49	106.8	70 - 130
D 53 13C8_PFOA	471343	468290			99.4	50 - 150
20 PFOA			1000.00	965.02	96.5	70 - 130
12 PFHpS			952.00	1085.73	114	70 - 130
18 PFOS			928.00	934.63	100.7	70 - 130
D 54 13C8_PFOS	121340	127538			105.1	50 - 150
17 PFNA			1000.00	1028.69	102.9	70 - 130
D 56 13C9_PFNA	533018	537584			100.9	50 - 150
30 9Cl-PF3ONS			932.00	921.16	98.8	70 - 130
D 55 13C8_PFOSA	264521	267989			101.3	50 - 150
19 PFOSA			1000.00	967.89	96.8	70 - 130
16 PFNS			960.00	969.62	101	70 - 130
D 65 13C2_8:2 FTS_2	83315	89281			107.2	50 - 150
3 8:2 FTS			958.00	872.61	91.1	70 - 130
10 PFDA			1000.00	1036.22	103.6	70 - 130
D 51 13C6_PFDA	536456	520767			97.1	50 - 150
6 N-MeFOSAA			1000.00	1010.37	101	70 - 130

Report Date: 15-Aug-2021 15:03:08 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421067.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	682896	679523			99.5	50 - 150
9 PFDS			964.00	954.83	99	70 - 130
D 60 d5-EtFOSAA	647090	601196			92.9	50 - 150
D 52 13C7_PFUdA	526346	566372			107.6	50 - 150
5 N-EtFOSAA			1000.00	1041.29	104.1	70 - 130
25 PFUdA			1000.00	1005.05	100.5	70 - 130
D 61 d7-MeFOSE	79416	88409			111.3	50 - 150
32 MeFOSE			1000.00	957.74	95.8	70 - 130
D 57 d3-MeFOSA	51765	42960			83	50 - 150
26 MeFOSA			1000.00	1233.72	123.4	70 - 130
31 11Cl-PF3OUDS			942.00	918.76	97.5	70 - 130
D 62 d9-EtFOSE	92317	92178			99.8	50 - 150
33 EtFOSE			1000.00	1027.11	102.7	70 - 130
D 59 d5-EtFOSA	42856	44243			103.2	50 - 150
27 EtFOSA			1000.00	857.73	85.8	70 - 130
11 PFDoA			1000.00	956.35	95.6	70 - 130
D 38 13C2_PFDoA	542630	559910			103.2	50 - 150
4 10:2 FTS			964.00	809.04	83.9	70 - 130
34 PFDOS			968.00	968.00	100	70 - 130
24 PFTrDA			1000.00	922.24	92.2	70 - 130
23 PFTeDA			1000.00	991.75	99.2	70 - 130
D 42 13C2_PFTeDA	824266	826170			100.2	50 - 150
35 PFHxDA			1000.00	967.64	96.8	70 - 130
D 40 13C2_PFHxDA	828267	839944			101.4	50 - 150
36 PFODA			1000.00	968.70	96.9	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081421-DOD.b\081421067.d
Injection Date: 15-Aug-2021 00:11:47 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 59
Sample Info: ID CCV 1000C_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	508734	21	>100:1			1000.00	915.93	96.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.711	1.718	0/0	523391	21	>100:1			1000.00	1029.40		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	0	502493	16	>100:1			1000.00	965.34	99.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.098	0/0	545791	16	>100:1			1000.00	996.17		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	0	171197	16	>100:1			1000.00	954.29	97.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	0/0	176891	17	>100:1	Target = 3.26		884.00	866.63		
298.9 > 99	44	2.151	2.151		54134	15	>100:1	3.26 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.487	2.496	0/0	137824	17	>100:1	Target = 3.15		938.00	897.15		
349 > 99	44	2.496	2.496		45928	17	>100:1	3.00 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.416	2.415	1	93266	16	>100:1			5000.00	4667.87	96.7	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.424	0/-1	38177	17	>100:1	Target = 1.68		934.00	950.33		
327 > 81	63	2.416	2.424		20735	19	>100:1	1.84 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.460	2.460	1	539383	18	>100:1			1000.00	922.18	95.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.460	2.460	1/0	563914	18	>100:1	Target = 18.18		1000.00	1000.54		
313 > 119	49	2.460	2.460		30241	22	>100:1	18.64 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.575	2.575	0	1045604	19	>100:1			5000.00	4856.11	100.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.575	2.575	0/0	269879	19	>100:1	Target = 0.79		2000.00	1848.12		
285 > 185	66	2.575	2.575		351077	19	>100:1	0.76 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.836	2.836	0	432880	18	>100:1			1000.00	894.88	99.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.836	2.836	0/0	502223	17	>100:1	Target = 3.65		1000.00	1038.60		
363 > 169	47	2.836	2.836		132169	16	>100:1	3.79 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.854	2.845	1	120124	17	>100:1			1000.00	894.61	98	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.854	2.845	1/0	131731	26	>100:1	Target = 3.10	0.18	910.00	1001.17		
399 > 99	45	2.854	2.845		42863	26	>100:1	3.07 (1.55-4.66)	0.07				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.873	2.873	0/-1	788142	19	>100:1	Target = 3.01		942.00	995.84		
377 > 85	45	2.873	2.873		249656	19	>100:1	3.15 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.227	3.221	1/0	124100	21	>100:1	Target = 2.85		952.00	1085.73		
449 > 99	45	3.221	3.221		39804	19	>100:1	3.11 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.201	3.194	1	81539	23	>100:1			5000.00	5053.45	96.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.194	3.201	0/-1	40139	23	>100:1	Target = 1.74		948.00	1012.49		
427 > 81	64	3.201	3.201		21780	20	>100:1	1.84 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.221	3.221	0	468290	21	>100:1			1000.00	1005.34	99.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.227	3.214	1/1	449794	20	>100:1	Target = 2.92		1000.00	965.02		
413 > 169	53	3.221	3.214		163448	21	>100:1	2.75 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.601	3.593	1	127538	19	>100:1			1000.00	958.70	105.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.601	3.601	1/0	135110	37	>100:1	Target = 3.34	0.22	928.00	934.63		
499 > 99	54	3.601	3.601		38142	33	>100:1	3.54 (1.67-5.02)	0.05				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.806	3.806	1/0	445561	19	>100:1			932.00	921.16		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.945	3.945	1/0	101203	16	>100:1	Target = 2.63		960.00	969.62		
549 > 99	54	3.945	3.945		36067	18	>100:1	2.80 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.247	4.247	1/0	100657	14	>100:1	Target = 2.65		964.00	954.83		
599 > 99	54	4.247	4.247		34525	14		2.91 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.405	4.405	0/-1	389782	18	>100:1			942.00	918.76		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.755	4.748	1/0	92418	20	>100:1	Target = 3.08		968.00	968.00		
699 > 99	54	4.755	4.748		27828	16	>100:1	3.32 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.609	3.601	1	537584	20	>100:1			1000.00	943.58	100.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.609	3.601	1/0	608237	19	>100:1	Target = 6.55		1000.00	1028.69		
463 > 169	56	3.609	3.601		93912	20	>100:1	6.47 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.895	3.895	1	267989	18	>100:1			1000.00	981.97	101.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.895	3.895	1/0	290588	18	>100:1	Target = 33.36		1000.00	967.89		
498>478	55	3.895	3.895		9889	18	26:1	29.38 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.945	3.937	1	89281	16				5000.00	4672.88	107.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.945	3.945	1/0	34896	15	>100:1	Target = 2.44		958.00	872.61		
527 > 81	65	3.954	3.945		18449	24	>100:1	1.89 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.552	4.552	1/0	37289	14	>100:1	Target = 3.72		964.00	809.04		
627 > 80	65	4.552	4.552		11244	15	79:1	3.31 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.954	3.945	1	520767	17	>100:1			1000.00	954.06	97.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.954	3.954	1/0	627105	18	>100:1	Target = 13.09		1000.00	1036.22		
513 > 169	51	3.954	3.954		56630	16	>100:1	11.07 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.115	4.107	1	679523	17	>100:1			5000.00	5432.06	99.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.115	4.115	1/0	112448	29	>100:1	Target = 1.36	0.11	1000.00	1010.37		M
570 > 483	58	4.115	4.115		83674	28	>100:1	1.34 (0.68-2.04)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.267	4.267	1	566372	17	>100:1			1000.00	955.84	107.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.267	4.267	1/0	538868	15	>100:1	Target = 14.48		1000.00	1005.05		
563 > 169	52	4.267	4.267		36814	19	>100:1	14.63 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.267	4.267	1	601196	15	>100:1			5000.00	5405.96	92.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.287	4.267	2/1	131343	32	>100:1	Target = 1.63		1000.00	1041.29		M
584 > 526	60	4.277	4.267		79716	31	>100:1	1.64 (0.81-2.44)	0.08				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.318	4.318	1	88409	14	>100:1			1000.00	1060.76	111.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.328	4.328	1/0	95395	14	>100:1			1000.00	957.74		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.338	4.338	1	42960	15	>100:1			1000.00	852.29	83	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.338	4.347	0/-1	56120	15	>100:1	Target = 1.09		1000.00	1233.72		
512 > 219	57	4.338	4.347		48169	15	>100:1	1.16 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.481	4.481	0	92178	16	>100:1			1000.00	985.17	99.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.490	4.499	0/0	90443	15	>100:1			1000.00	1027.11		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.499	4.508	0	44243	19	>100:1			1000.00	1000.53	103.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.508	4.517	0/0	42859	14	>100:1	Target = 1.02		1000.00	857.73		
526 > 219	59	4.508	4.517		44085	15	>100:1	0.97 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.544	4.535	1	559910	17	>100:1			1000.00	959.93	103.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.544	4.535	1/0	566667	18	>100:1	Target = 10.77		1000.00	956.35		
613 > 169	38	4.544	4.535		51948	15	>100:1	10.90 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.782	4.775	1/0	486587	21	>100:1	Target = 8.06		1000.00	922.24		
663 > 169	38	4.782	4.775		62172	19	>100:1	7.82 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.004	4.998	1	826170	21	>100:1			1000.00	923.58	100.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.004	4.998	1/0	658753	21	>100:1	Target = 11.68		1000.00	991.75		
713 > 169	42	5.004	4.998		57194	19	>100:1	11.51 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.399	5.390	1	839944	18	>100:1			1000.00	1004.65	101.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.399	5.390	1/0	564178	18	>100:1	Target = 10.53		1000.00	967.64		
813 > 269	40	5.399	5.390		53567	17	>100:1	10.53 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.789	5.775	1/0	702978	23	85:1	Target = 13.30		1000.00	968.70		
913 > 319	40	5.782	5.775		54438	22	>100:1	12.91 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.954	3.954	1	588429	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.460	2.460	1	525771	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.221	3.221	0	491422	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	480406	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.601	3.593	1	132911	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521005.d
Injection Date: 15-Aug-2021 12:33:49 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1055815	999826			94.7	50 - 150
8 PFBA			100.00	103.93	103.9	70 - 130
21 PFPeA			100.00	102.75	102.8	70 - 130
D 50 13C5_PFPeA	1049419	977053			93.1	50 - 150
D 44 13C3_PFBS	314416	311684			99.1	50 - 150
7 PFBS			88.400	89.842	101.6	70 - 130
1 4:2 FTS			93.400	108.36	116	70 - 130
D 63 13C2_4:2 FTS_2	278992	271879			97.5	50 - 150
D 49 13C5_PFHxA	872566	896581			102.8	50 - 150
15 PFHxA			100.00	101.01	101	70 - 130
22 PFPeS			93.800	109.24	116.5	70 - 130
28 GenX			200.00	182.09	91	70 - 130
D 66 13C3_GenX	611910	743365			121.5	50 - 150
D 47 13C4_PFHpA	933088	959428			102.8	50 - 150
13 PFHpA			100.00	108.50	108.5	70 - 130
D 45 13C3_PFHxS	254408	255345			100.4	50 - 150
14 PFHxS			91.000	83.066	91.3	70 - 130
29 ADONA			94.200	101.43	107.7	70 - 130
D 64 13C2_6:2 FTS_2	250534	260845			104.1	50 - 150
2 6:2 FTS			94.800	85.520	90.2	70 - 130
20 PFOA			100.00	104.40	104.4	70 - 130
D 53 13C8_PFOA	919907	932336			101.4	50 - 150
12 PFHpS			95.200	100.09	105.1	70 - 130
18 PFOS			92.800	81.746	88.1	70 - 130
D 54 13C8_PFOS	219295	244442			111.5	50 - 150
D 56 13C9_PFNA	904226	971716			107.5	50 - 150
17 PFNA			100.00	88.258	88.3	70 - 130
30 9Cl-PF3ONS			93.200	74.665	80.1	70 - 130
D 55 13C8_PFOSA	428055	424585			99.2	50 - 150
19 PFOSA			100.00	99.600	99.6	70 - 130
16 PFNS			96.000	88.944	92.6	70 - 130
D 65 13C2_8:2 FTS_2	239459	230058			96.1	50 - 150
3 8:2 FTS			95.800	89.387	93.3	70 - 130
D 51 13C6_PFDA	809951	836645			103.3	50 - 150
10 PFDA			100.00	97.303	97.3	70 - 130
D 58 d3-MeFOSAA	1157951	1090816			94.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	116.07	116.1	70 - 130
9 PFDS			96.400	99.775	103.5	70 - 130
25 PFUdA			100.00	105.56	105.6	70 - 130
D 60 d5-EtFOSAA	957645	982624			102.6	50 - 150
D 52 13C7_PFUdA	726972	709992			97.7	50 - 150
5 N-EtFOSAA			100.00	89.244	89.2	70 - 130
D 61 d7-MeFOSE	129289	145559			112.6	50 - 150
D 57 d3-MeFOSA	58022	56405			97.2	50 - 150
32 MeFOSE			100.00	93.873	93.9	70 - 130
26 MeFOSA			100.00	99.765	99.8	70 - 130
31 11Cl-PF3OUDS			94.200	90.791	96.4	70 - 130
D 62 d9-EtFOSE	125524	140913			112.3	50 - 150
33 EtFOSE			100.00	99.509	99.5	70 - 130
D 59 d5-EtFOSA	61517	54516			88.6	50 - 150
27 EtFOSA			100.00	122.47	122.5	70 - 130
D 38 13C2_PFDoA	690580	729865			105.7	50 - 150
11 PFDoA			100.00	105.08	105.1	70 - 130
4 10:2 FTS			96.400	103.10	106.9	70 - 130
34 PFDOS			96.800	82.296	85	70 - 130
24 PFTrDA			100.00	123.08	123.1	70 - 130
D 42 13C2_PFTeDA	788343	900998			114.3	50 - 150
23 PFTeDA			100.00	98.769	98.8	70 - 130
D 40 13C2_PFHxDA	379801	488344			128.6	50 - 150
35 PFHxDA			100.00	108.05	108	70 - 130
36 PFODA			100.00	92.848	92.8	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521005.d
Injection Date: 15-Aug-2021 12:33:49 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.720	1.720	1	999826	20	>100:1			1000.00	959.38	94.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.720	1.720	1/0	108040	20	71:1			100.00	103.93		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.088	1	977053	15	>100:1			1000.00	962.91	93.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	0/-1	107735	13	92:1			100.00	102.75		M
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	311684	16	>100:1			1000.00	1005.20	99.1	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	36354	16	>100:1	Target = 3.62		88.400	89.842		
298.9 > 99	44	2.141	2.141		9167	14	72:1	3.96 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.494	2.494	2/1	32121	24	>100:1	Target = 3.24		93.800	109.24		
349 > 99	44	2.494	2.494		7724	18	74:1	4.15 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.415	2.415	1	271879	18	>100:1			5000.00	4720.36	97.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.415	2.415	0/-1	11211	16	>100:1	Target = 1.40		93.400	108.36		
327 > 81	63	2.415	2.415		7277	14	29:1	1.54 (0.70-2.10)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.459	2.459	2	896581	18	>100:1			1000.00	1008.60	102.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.459	2.459	0/-2	90612	18	>100:1	Target = 16.70		100.00	101.01		
313 > 119	49	2.459	2.459		5682	15	32:1	15.94 (8.35-25.06)					M
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.587	2.587	2	743365	19	>100:1			5000.00	5872.00	121.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.579	2.579	2/0	23562	18	>100:1	Target = 0.81		200.00	182.09		
285 > 185	66	2.579	2.579		28928	17	>100:1	0.81 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.848	2.848	2	959428	19	>100:1			1000.00	1049.92	102.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.848	2.848	2/0	93086	19	>100:1	Target = 3.14		100.00	108.50		
363 > 169	47	2.848	2.848		25631	17	72:1	3.63 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.865	2.865	2	255345	19	>100:1			1000.00	1030.40	100.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.865	2.865	2/0	24782	28	100:1	Target = 3.29	0.14	91.000	83.066		
399 > 99	45	2.865	2.865		6251	26	23:1	3.96 (1.64-4.94)	0.14				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.883	2.883	1/-1	153372	17	>100:1	Target = 2.66		94.200	101.43		
377 > 85	45	2.892	2.883		56558	24	>100:1	2.71 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.231	3.231	1/-1	25862	21	>100:1	Target = 3.57		95.200	100.09		
449 > 99	45	3.237	3.231		6901	26	56:1	3.74 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.211	3.211	2	260845	21	>100:1			5000.00	5198.45	104.1	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.205	3.205	1/-1	8553	21	70:1	Target = 1.53		94.800	85.520		
427 > 81	64	3.205	3.205		6948	18	37:1	1.23 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.231	3.231	1	932336	21	>100:1			1000.00	1027.45	101.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.243	3.243	2/1	97551	23	36:1	Target = 2.76		100.00	104.40		
413 > 169	53	3.231	3.243		32034	24	82:1	3.04 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.613	3.613	2	244442	19	>100:1			1000.00	1097.82	111.5	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.613	3.613	0/-2	22575	38	80:1	Target = 3.99	0.35	92.800	81.746		
499 > 99	54	3.613	3.613		5933	33	43:1	3.80 (1.99-5.98)	0.13				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.810	3.810	2/0	55294	25	>100:1			93.200	74.665		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.946	3.946	0/-2	19205	22	97:1	Target = 3.23		96.000	88.944		
549 > 99	54	3.954	3.946		4574	19	26:1	4.19 (1.61-4.85)					M
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.252	4.252	3/1	23281	15	>100:1	Target = 3.16		96.400	99.775		
599 > 99	54	4.243	4.252		5147	19		4.52 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.407	4.407	2/0	54316	23	>100:1			94.200	90.791		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.762	4.762	3/1	14455	20	>100:1	Target = 3.30		96.800	82.296		
699 > 99	54	4.756	4.762		4616	26	54:1	3.13 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.613	3.613	2	971716	20	>100:1			1000.00	1121.74	107.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.613	3.613	2/0	77518	20	>100:1	Target = 5.07		100.00	88.258		
463 > 169	56	3.613	3.613		15782	18	>100:1	4.91 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.869	3.869	1	424585	18	>100:1			1000.00	991.97	99.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.862	3.862	0/-1	46225	17	76:1	Target = 39.40		100.00	99.600		
498>478	55	3.877	3.862		1014	17	11:1	45.58 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.954	3.954	2	230058	19	>100:1			5000.00	5100.54	96.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.963	3.963	3/1	7293	25	24:1	Target = 1.43		95.800	89.387		
527 > 81	65	3.954	3.963		6887	22	46:1	1.05 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.553	4.553	2/0	9223	23	>100:1	Target = 2.34		96.400	103.10		
627 > 80	65	4.561	4.553		3548	22	22:1	2.59 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.963	3.963	2	836645	18	>100:1			1000.00	1091.42	103.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.963	3.963	2/0	77273	18	>100:1	Target = 10.17		100.00	97.303		
513 > 169	51	3.963	3.963		7627	24	35:1	10.13 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.116	4.116	2	1090816	17	>100:1			5000.00	5383.69	94.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.124	4.124	0/-2	20894	35	>100:1	Target = 1.51		100.00	116.07		M
570 > 483	58	4.124	4.124		13556	31	65:1	1.54 (0.75-2.27)	0.25				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.271	4.271	3	709992	16	>100:1			1000.00	1001.82	97.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.271	4.271	3/0	68836	17	>100:1	Target = 9.80		100.00	105.56		
563 > 169	52	4.262	4.271		7207	13	52:1	9.55 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.271	4.271	3	982624	16	>100:1			5000.00	5454.51	102.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.290	4.290	0/-3	18439	33	>100:1	Target = 1.83		100.00	89.244		M
584 > 526	60	4.280	4.290		12298	35	61:1	1.49 (0.91-2.75)	0.24				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.271	4.271	0	145559	21	>100:1			1000.00	1072.07	112.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.280	4.280	0/0	13763	17	31:1			100.00	93.873		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.290	4.290	0	56405	14	95:1			1000.00	937.48	97.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.299	4.299	0/0	6123	11	30:1	Target = 1.13		100.00	99.765		M
512 > 219	57	4.290	4.299		7901	10	72:1	0.77 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.435	4.435	0	140913	17	>100:1			1000.00	1073.34	112.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.441	4.441	0/0	10266	14	44:1			100.00	99.509		M
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.455	4.455	0	54516	17	>100:1			1000.00	928.89	88.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.455	4.455	0/0	7296	17	38:1	Target = 1.10		100.00	122.47		
526 > 219	59	4.455	4.455		5823	17	21:1	1.25 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.545	4.545	2	729865	17	>100:1			1000.00	1032.07	105.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.545	4.545	2/0	75261	18	75:1	Target = 7.70		100.00	105.08		
613 > 169	38	4.545	4.545		13155	21	>100:1	5.72 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.785	4.785	3/1	37268	19	>100:1	Target = 3.41		100.00	123.08		
663 > 169	38	4.790	4.785		9641	20	>100:1	3.86 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.014	5.014	3	900998	19	>100:1			1000.00	1050.08	114.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.014	5.014	3/0	74658	18	16:1	Target = 9.31		100.00	98.769		
713 > 169	42	5.014	5.014		8143	22	100:1	9.16 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.425	5.425	4	488344	17	>100:1			1000.00	1280.15	128.6	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.425	5.425	4/0	91394	18	8.2:1	Target = 13.26		100.00	108.05		
813 > 269	40	5.425	5.425		6907	16	>100:1	13.23 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.840	5.840	6/2	46889	21	>100:1	Target = 99.70		100.00	92.848		
913 > 319	40	5.833	5.840		474	21	42:1	98.92 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.963	3.963	2	714380	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.459	2	839784	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.237	3.237	2	930948	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.720	1.720	1	1005189	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.606	3.606	2	216466	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521006.d
Injection Date: 15-Aug-2021 12:44:23 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	999826	1000442			100.1	50 - 150
8 PFBA			200.00	202.49	101.2	70 - 130
21 PFPeA			200.00	203.98	102	70 - 130
D 50 13C5_PFPeA	977053	935731			95.8	50 - 150
D 44 13C3_PFBS	311684	311769			100	50 - 150
7 PFBS			176.80	177.37	100.3	70 - 130
1 4:2 FTS			186.80	134.30	71.9	70 - 130
D 63 13C2_4:2 FTS_2	271879	346352			127.4	50 - 150
D 49 13C5_PFHxA	896581	1041727			116.2	50 - 150
15 PFHxA			200.00	168.76	84.4	70 - 130
22 PFPeS			187.60	219.19	116.8	70 - 130
28 GenX			400.00	383.89	96	70 - 130
D 66 13C3_GenX	743365	703169			94.6	50 - 150
D 47 13C4_PFHpA	959428	950862			99.1	50 - 150
13 PFHpA			200.00	201.37	100.7	70 - 130
D 45 13C3_PFHxS	255345	267227			104.7	50 - 150
14 PFHxS			182.00	163.03	89.6	70 - 130
29 ADONA			188.40	179.33	95.2	70 - 130
D 64 13C2_6:2 FTS_2	260845	244028			93.6	50 - 150
2 6:2 FTS			189.60	227.90	120.2	70 - 130
20 PFOA			200.00	205.21	102.6	70 - 130
D 53 13C8_PFOA	932336	899833			96.5	50 - 150
12 PFHpS			190.40	176.87	92.9	70 - 130
18 PFOS			185.60	188.27	101.4	70 - 130
D 54 13C8_PFOS	244442	211830			86.7	50 - 150
D 56 13C9_PFNA	971716	932020			95.9	50 - 150
17 PFNA			200.00	191.67	95.8	70 - 130
30 9Cl-PF3ONS			186.40	180.19	96.7	70 - 130
D 55 13C8_PFOSA	424585	450497			106.1	50 - 150
19 PFOSA			200.00	181.71	90.9	70 - 130
16 PFNS			192.00	209.98	109.4	70 - 130
D 65 13C2_8:2 FTS_2	230058	227514			98.9	50 - 150
3 8:2 FTS			191.60	199.24	104	70 - 130
D 51 13C6_PFDA	836645	827262			98.9	50 - 150
10 PFDA			200.00	216.58	108.3	70 - 130
D 58 d3-MeFOSAA	1090816	1097851			100.6	50 - 150

Report Date: 16-Aug-2021 13:04:35 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	180.91	90.5	70 - 130
9 PFDS			192.80	207.54	107.6	70 - 130
25 PFUdA			200.00	204.95	102.5	70 - 130
D 60 d5-EtFOSAA	982624	1025779			104.4	50 - 150
D 52 13C7_PFUdA	709992	761438			107.2	50 - 150
5 N-EtFOSAA			200.00	214.20	107.1	70 - 130
D 61 d7-MeFOSE	145559	165331			113.6	50 - 150
D 57 d3-MeFOSA	56405	58946			104.5	50 - 150
32 MeFOSE			200.00	160.17	80.1	70 - 130
26 MeFOSA			200.00	175.49	87.7	70 - 130
31 11Cl-PF3OUDS			188.40	188.62	100.1	70 - 130
D 62 d9-EtFOSE	140913	140886			100	50 - 150
33 EtFOSE			200.00	226.97	113.5	70 - 130
D 59 d5-EtFOSA	54516	57700			105.8	50 - 150
27 EtFOSA			200.00	178.02	89	70 - 130
D 38 13C2_PFDoA	729865	753509			103.2	50 - 150
11 PFDoA			200.00	200.87	100.4	70 - 130
4 10:2 FTS			192.80	217.38	112.7	70 - 130
34 PFDOS			193.60	214.88	111	70 - 130
24 PFTrDA			200.00	205.27	102.6	70 - 130
D 42 13C2_PFTeDA	900998	931844			103.4	50 - 150
23 PFTeDA			200.00	194.27	97.1	70 - 130
D 40 13C2_PFHxDA	488344	491855			100.7	50 - 150
35 PFHxDA			200.00	192.99	96.5	70 - 130
36 PFODA			200.00	177.32	88.7	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521006.d
Injection Date: 15-Aug-2021 12:44:23 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.719	1.720	0	1000442	20	>100:1			1000.00	959.97	100.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.719	1.720	0/0	210619	18	16:1			200.00	202.49		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.076	2.088	0	935731	17	>100:1			1000.00	922.19	95.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.087	2.088	0/0	204822	14	>100:1			200.00	203.98		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.139	2.141	0	311769	16	>100:1			1000.00	1005.47	100	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.139	2.141	0/0	71793	16	>100:1	Target = 3.62		176.80	177.37		
298.9 > 99	44	2.139	2.141		20369	17	>100:1	3.52 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.492	2.494	0/0	64465	19	>100:1	Target = 3.24		187.60	219.19		
349 > 99	44	2.501	2.494		15802	25	>100:1	4.07 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.423	2.415	1	346352	18	>100:1			5000.00	6013.36	127.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.414	2.415	0/-1	17700	22		Target = 1.40		186.80	134.30		M
327 > 81	63	2.423	2.415		15086	23	>100:1	1.17 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.466	2.459	1	1041727	18	>100:1			1000.00	1171.88	116.2	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.457	2.459	0/-1	175891	17	>100:1	Target = 16.70		200.00	168.76		
313 > 119	49	2.457	2.459		9852	21	41:1	17.85 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.578	2.587	0	703169	19	>100:1			5000.00	5554.49	94.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.586	2.579	1/1	46989	20	>100:1	Target = 0.81		400.00	383.89		
285 > 185	66	2.578	2.579		60355	20	>100:1	0.77 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.844	2.848	0	950862	18	>100:1			1000.00	1040.55	99.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.844	2.848	0/0	171214	19	>100:1	Target = 3.14		200.00	201.37		
363 > 169	47	2.844	2.848		51642	18	>100:1	3.31 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.862	2.865	0	267227	19	>100:1			1000.00	1078.34	104.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.862	2.865	0/0	50901	27	>100:1	Target = 3.29	0.18	182.00	163.03		
399 > 99	45	2.862	2.865		14882	24	81:1	3.42 (1.64-4.94)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.888	2.883	1/1	283780	20	>100:1	Target = 2.66		188.40	179.33		
377 > 85	45	2.888	2.883		105993	21	>100:1	2.67 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.233	3.231	1/1	47827	18	>100:1	Target = 3.57		190.40	176.87		
449 > 99	45	3.233	3.231		14969	18	>100:1	3.19 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.202	3.211	0	244028	23	>100:1			5000.00	4863.30	93.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.202	3.205	0/0	21323	19	>100:1	Target = 1.53		189.60	227.90		
427 > 81	64	3.208	3.205		13604	38	>100:1	1.56 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.233	3.231	1	899833	22	>100:1			1000.00	991.63	96.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.227	3.243	0/-1	185068	27	78:1	Target = 2.76		200.00	205.21		
413 > 169	53	3.233	3.243		64687	21	>100:1	2.86 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.608	3.613	0	211830	18	>100:1			1000.00	951.35	86.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.608	3.613	0/0	45057	36	>100:1	Target = 3.99	0.26	185.60	188.27		
499 > 99	54	3.615	3.613		11579	40	72:1	3.89 (1.99-5.98)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.811	3.810	1/1	115640	17	>100:1			186.40	180.19		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.939	3.946	0/0	39291	19	>100:1	Target = 3.23		192.00	209.98		
549 > 99	54	3.939	3.946		10407	18	81:1	3.77 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.244	4.252	0/0	41966	21	>100:1	Target = 3.16		192.80	207.54		
599 > 99	54	4.244	4.252		12950	13	40:1	3.24 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.399	4.407	0/0	97788	17	>100:1			188.40	188.62		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.757	4.762	0/0	32708	19	>100:1	Target = 3.30		193.60	214.88		
699 > 99	54	4.757	4.762		9162	28	>100:1	3.56 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.608	3.613	0	932020	19	>100:1			1000.00	1075.91	95.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.608	3.613	0/0	161468	20	>100:1	Target = 5.07		200.00	191.67		
463 > 169	56	3.608	3.613		32300	25	>100:1	4.99 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.862	3.869	0	450497	17	>100:1			1000.00	1052.51	106.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.862	3.862	1/1	89481	27	>100:1	Target = 39.40		200.00	181.71		
498>478	55	3.855	3.862		1614	20	5.9:1	55.44 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.947	3.954	0	227514	25	>100:1			5000.00	5044.14	98.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.955	3.963	0/0	16076	19	>100:1	Target = 1.43		191.60	199.24		
527 > 81	65	3.947	3.963		10735	20	65:1	1.49 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.546	4.553	0/0	19231	16	>100:1	Target = 2.34		192.80	217.38		
627 > 80	65	4.546	4.553		6770	14	71:1	2.84 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.955	3.963	0	827262	17	>100:1			1000.00	1079.18	98.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.955	3.963	0/0	170068	20	>100:1	Target = 10.17		200.00	216.58		
513 > 169	51	3.955	3.963		13951	16	69:1	12.19 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.109	4.116	0	1097851	17	>100:1			5000.00	5418.41	100.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.109	4.124	0/0	32777	32	>100:1	Target = 1.51		200.00	180.91		M
570 > 483	58	4.118	4.124		26886	33	>100:1	1.21 (0.75-2.27)	0.13				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.263	4.271	0	761438	16	>100:1			1000.00	1074.41	107.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.263	4.271	0/0	143325	17	>100:1	Target = 9.80		200.00	204.95		
563 > 169	52	4.263	4.271		14400	14	43:1	9.95 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.263	4.271	0	1025779	16	>100:1			5000.00	5694.06	104.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.263	4.290	-1/-1	46201	35	>100:1	Target = 1.83	0.10	200.00	214.20		M
584 > 526	60	4.273	4.290		23641	30	>100:1	1.95 (0.91-2.75)	0.20				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.273	4.271	1	165331	15	>100:1			1000.00	1217.70	113.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.280	1/0	26673	16	63:1			200.00	160.17		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.291	4.290	1	58946	14	>100:1			1000.00	979.72	104.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.300	4.299	1/0	11256	13	40:1	Target = 1.13		200.00	175.49		M
512 > 219	57	4.300	4.299		14419	14	41:1	0.78 (0.56-1.70)					M
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.436	4.435	1	140886	18	>100:1			1000.00	1073.14	100	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.442	4.441	1/0	23411	15	>100:1			200.00	226.97		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.449	4.455	0	57700	16	>100:1			1000.00	983.15	105.8	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.464	4.455	1/1	11225	19	53:1	Target = 1.10		200.00	178.02		M
526 > 219	59	4.464	4.455		12099	12	55:1	0.92 (0.55-1.65)					M
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.538	4.545	0	753509	16	>100:1			1000.00	1065.50	103.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.538	4.545	0/0	148533	16	>100:1	Target = 7.70		200.00	200.87		
613 > 169	38	4.538	4.545		19055	22	>100:1	7.79 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.780	4.785	0/0	64168	27	>100:1	Target = 3.41		200.00	205.27		
663 > 169	38	4.780	4.785		18342	25	>100:1	3.49 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.008	5.014	0	931844	19	>100:1			1000.00	1086.03	103.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.008	5.014	0/0	151869	20	31:1	Target = 9.31		200.00	194.27		
713 > 169	42	5.001	5.014		15926	17	>100:1	9.53 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.417	5.425	0	491855	17	>100:1			1000.00	1289.35	100.7	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.417	5.425	0/0	164414	18	13:1	Target = 13.26		200.00	192.99		
813 > 269	40	5.417	5.425		12641	21	>100:1	13.00 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.824	5.840	0/0	90191	21	11:1	Target = 99.70		200.00	177.32		
913 > 319	40	5.832	5.840		1016	24	50:1	88.77 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.955	3.963	0	828738	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.457	2.459	0	864896	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.233	3.237	0	946217	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.719	1.720	0	999801	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.600	3.606	0	233191	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521036.d
Injection Date: 15-Aug-2021 18:01:49 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 26
Sample Info: CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	999826	1052450			105.3	50 - 150
8 PFBA			1000.00	984.37	98.4	70 - 130
21 PFPeA			1000.00	1008.51	100.9	70 - 130
D 50 13C5_PFPeA	977053	1003487			102.7	50 - 150
D 44 13C3_PFBS	311684	325337			104.4	50 - 150
7 PFBS			884.00	843.95	95.5	70 - 130
1 4:2 FTS			934.00	901.41	96.5	70 - 130
D 63 13C2_4:2 FTS_2	271879	297449			109.4	50 - 150
D 49 13C5_PFHxA	896581	872187			97.3	50 - 150
15 PFHxA			1000.00	1067.56	106.8	70 - 130
22 PFPeS			938.00	980.03	104.5	70 - 130
28 GenX			2000.00	1709.94	85.5	70 - 130
D 66 13C3_GenX	743365	731077			98.3	50 - 150
D 47 13C4_PFHpA	959428	960806			100.1	50 - 150
13 PFHpA			1000.00	970.89	97.1	70 - 130
D 45 13C3_PFHxS	255345	283688			111.1	50 - 150
14 PFHxS			910.00	811.98	89.2	70 - 130
29 ADONA			942.00	806.30	85.6	70 - 130
D 64 13C2_6:2 FTS_2	260845	267632			102.6	50 - 150
2 6:2 FTS			948.00	999.42	105.4	70 - 130
20 PFOA			1000.00	1030.79	103.1	70 - 130
D 53 13C8_PFOA	932336	929082			99.7	50 - 150
12 PFHpS			952.00	867.87	91.2	70 - 130
18 PFOS			928.00	969.37	104.5	70 - 130
D 54 13C8_PFOS	244442	203867			83.4	50 - 150
D 56 13C9_PFNA	971716	932434			96	50 - 150
17 PFNA			1000.00	990.97	99.1	70 - 130
30 9Cl-PF3ONS			932.00	1023.82	109.9	70 - 130
D 55 13C8_PFOSA	424585	428357			100.9	50 - 150
19 PFOSA			1000.00	1113.72	111.4	70 - 130
16 PFNS			960.00	1040.07	108.3	70 - 130
D 65 13C2_8:2 FTS_2	230058	242147			105.3	50 - 150
3 8:2 FTS			958.00	902.04	94.2	70 - 130
D 51 13C6_PFDA	836645	819370			97.9	50 - 150
10 PFDA			1000.00	994.43	99.4	70 - 130
D 58 d3-MeFOSAA	1090816	1214402			111.3	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	821.08	82.1	70 - 130
9 PFDS			964.00	1147.53	119	70 - 130
25 PFUdA			1000.00	904.41	90.4	70 - 130
D 60 d5-EtFOSAA	982624	1092939			111.2	50 - 150
D 52 13C7_PFUdA	709992	828646			116.7	50 - 150
5 N-EtFOSAA			1000.00	928.71	92.9	70 - 130
D 61 d7-MeFOSE	145559	144283			99.1	50 - 150
D 57 d3-MeFOSA	56405	59695			105.8	50 - 150
32 MeFOSE			1000.00	1020.91	102.1	70 - 130
26 MeFOSA			1000.00	1050.36	105	70 - 130
31 11Cl-PF3OUDS			942.00	1059.74	112.5	70 - 130
D 62 d9-EtFOSE	140913	143550			101.9	50 - 150
33 EtFOSE			1000.00	1054.83	105.5	70 - 130
D 59 d5-EtFOSA	54516	60452			110.9	50 - 150
27 EtFOSA			1000.00	1040.09	104	70 - 130
D 38 13C2_PFDoA	729865	759205			104	50 - 150
11 PFDoA			1000.00	1088.99	108.9	70 - 130
4 10:2 FTS			964.00	984.15	102.1	70 - 130
34 PFDOS			968.00	1146.75	118.5	70 - 130
24 PFTrDA			1000.00	1005.68	100.6	70 - 130
D 42 13C2_PFTeDA	900998	951442			105.6	50 - 150
23 PFTeDA			1000.00	1066.16	106.6	70 - 130
D 40 13C2_PFHxDA	488344	482679			98.8	50 - 150
35 PFHxDA			1000.00	935.94	93.6	70 - 130
36 PFODA			1000.00	1017.03	101.7	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521036.d
Injection Date: 15-Aug-2021 18:01:49 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 26
Sample Info: CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.720	0	1052450	20	>100:1			1000.00	1009.88	105.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.714	1.720	0/0	1077123	21	>100:1			1000.00	984.37		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.088	-1	1003487	16	>100:1			1000.00	988.96	102.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.088	-1/0	1086010	16	>100:1			1000.00	1008.51		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.141	-1	325337	16	>100:1			1000.00	1049.23	104.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.141	-1/0	356457	15	>100:1	Target = 3.62		884.00	843.95		
298.9 > 99	44	2.120	2.141		91353	15	>100:1	3.90 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.476	2.494	-1/0	300779	17	>100:1	Target = 3.24		938.00	980.03		
349 > 99	44	2.476	2.494		85985	18	>100:1	3.49 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.415	0	297449	20	>100:1			5000.00	5164.31	109.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.415	-1/-1	102029	18		Target = 1.40		934.00	901.41		
327 > 81	63	2.398	2.415		76154	21	>100:1	1.33 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.459	-1	872187	18	>100:1			1000.00	981.16	97.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.459	-1/0	931572	18	>100:1	Target = 16.70		1000.00	1067.56		
313 > 119	49	2.441	2.459		48713	19	>100:1	19.12 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.563	2.587	-1	731077	20	>100:1			5000.00	5774.94	98.3	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.563	2.579	-1/0	217608	19	>100:1	Target = 0.81		2000.00	1709.94		
285 > 185	66	2.563	2.579		284316	20	>100:1	0.76 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.848	-1	960806	19	>100:1			1000.00	1051.43	100.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.827	2.848	-1/0	834150	18	>100:1	Target = 3.14		1000.00	970.89		
363 > 169	47	2.827	2.848		271510	17	>100:1	3.07 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.845	2.865	-1	283688	19	>100:1			1000.00	1144.77	111.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.845	2.865	-1/0	269137	25	>100:1	Target = 3.29	0.18	910.00	811.98		
399 > 99	45	2.836	2.865		83797	23	>100:1	3.21 (1.64-4.94)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.871	2.883	0/1	1354518	18	>100:1	Target = 2.66		942.00	806.30		
377 > 85	45	2.862	2.883		549285	19	>100:1	2.46 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.214	3.231	0/1	249137	23	>100:1	Target = 3.57		952.00	867.87		
449 > 99	45	3.214	3.231		73593	22	>100:1	3.38 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.182	3.211	-1	267632	23	>100:1			5000.00	5333.71	102.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.189	3.205	0/1	102554	30	>100:1	Target = 1.53		948.00	999.42		
427 > 81	64	3.182	3.205		61800	22	>100:1	1.65 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.231	-1	929082	23	>100:1			1000.00	1023.87	99.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.214	3.243	-1/0	959819	23	>100:1	Target = 2.76		1000.00	1030.79		
413 > 169	53	3.214	3.243		345069	23	>100:1	2.78 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.583	3.613	-1	203867	20	>100:1			1000.00	915.59	83.4	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.583	3.613	-1/0	223267	38	>100:1	Target = 3.99	0.27	928.00	969.37		
499 > 99	54	3.576	3.613		57548	39	>100:1	3.87 (1.99-5.98)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.778	3.810	-1/0	632347	20	>100:1			932.00	1023.82		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.919	3.946	-1/0	187298	18	>100:1	Target = 3.23		960.00	1040.07		
549 > 99	54	3.919	3.946		57488	17	>100:1	3.25 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.210	4.252	-2/-1	223312	17	>100:1	Target = 3.16		964.00	1147.53		
599 > 99	54	4.218	4.252		64139	15	>100:1	3.48 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.375	4.407	-1/0	528755	15	>100:1			942.00	1059.74		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.720	4.762	-2/-1	167987	18	>100:1	Target = 3.30		968.00	1146.75		
699 > 99	54	4.720	4.762		49009	19	>100:1	3.42 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.583	3.613	-1	932434	20	>100:1			1000.00	1076.39	96	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.583	3.613	-1/0	835201	21	>100:1	Target = 5.07		1000.00	990.97		
463 > 169	56	3.583	3.613		165879	19	>100:1	5.03 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.859	3.869	0	428357	19	>100:1			1000.00	1000.78	100.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.859	3.862	0/0	521478	19	>100:1	Target = 39.40		1000.00	1113.72		
498>478	55	3.859	3.862		10340	26		50.43 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.919	3.954	-2	242147	18	>100:1			5000.00	5368.56	105.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.919	3.963	-2/0	77464	19	>100:1	Target = 1.43		958.00	902.04		
527 > 81	65	3.919	3.963		48949	19		1.58 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.514	4.553	-2/0	92667	16		Target = 2.34		964.00	984.15		
627 > 80	65	4.514	4.553		40839	18		2.26 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.926	3.963	-2	819370	19	>100:1			1000.00	1068.88	97.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.926	3.963	-2/0	773418	17	>100:1	Target = 10.17		1000.00	994.43		
513 > 169	51	3.919	3.963		74058	18	>100:1	10.44 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.079	4.116	-2	1214402	17	>100:1			5000.00	5993.65	111.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.079	4.124	-2/0	164555	32	>100:1	Target = 1.51	0.06	1000.00	821.08		M
570 > 483	58	4.087	4.124		118592	32	>100:1	1.38 (0.75-2.27)	0.19				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.237	4.271	-2	828646	17	>100:1			1000.00	1169.25	116.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.237	4.271	-2/0	688298	17	>100:1	Target = 9.80		1000.00	904.41		
563 > 169	52	4.237	4.271		67158	17	>100:1	10.24 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.237	4.271	-2	1092939	17	>100:1			5000.00	6066.86	111.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.246	4.290	-2/0	213427	33	>100:1	Target = 1.83		1000.00	928.71		M
584 > 526	60	4.246	4.290		132831	33	>100:1	1.60 (0.91-2.75)	0.23				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.274	4.271	1	144283	15	>100:1			1000.00	1062.68	99.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.284	4.280	1/0	148366	14	>100:1			1000.00	1020.91		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.293	4.290	1	59695	17	>100:1			1000.00	992.17	105.8	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.299	1/0	68225	13	62:1	Target = 1.13		1000.00	1050.36		
512 > 219	57	4.293	4.299		62548	21	71:1	1.09 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.436	4.435	1	143550	17	>100:1			1000.00	1093.43	101.9	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.450	4.441	1/0	110860	19	>100:1			1000.00	1054.83		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.457	4.455	1	60452	20	>100:1			1000.00	1030.04	110.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.465	4.455	1/0	68709	17	>100:1	Target = 1.10		1000.00	1040.09		
526 > 219	59	4.465	4.455		57896	18	>100:1	1.18 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.506	4.545	-2	759205	17	>100:1			1000.00	1073.55	104	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.498	4.545	-2/0	811334	17	>100:1	Target = 7.70		1000.00	1088.99		
613 > 169	38	4.506	4.545		82728	15	>100:1	9.80 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.745	4.785	-2/0	316759	21	>100:1	Target = 3.41		1000.00	1005.68		
663 > 169	38	4.745	4.785		98100	20	>100:1	3.22 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.965	5.014	-2	951442	17	>100:1			1000.00	1108.87	105.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.965	5.014	-2/0	851010	17	>100:1	Target = 9.31		1000.00	1066.16		
713 > 169	42	4.965	5.014		89348	19	>100:1	9.52 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.355	5.425	-4	482679	17	>100:1			1000.00	1265.30	98.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.364	5.425	-3/1	782489	18	70:1	Target = 13.26		1000.00	935.94		
813 > 269	40	5.355	5.425		60182	17	>100:1	13.00 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.744	5.840	-5/-1	507650	22	59:1	Target = 99.70		1000.00	1017.03		
913 > 319	40	5.744	5.840		4900	23	>100:1	103.60 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.926	3.963	-2	783242	19	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.459	-1	929131	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.237	-1	974394	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.720	0	1026882	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.576	3.606	-1	235600	21	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521051.d
Injection Date: 15-Aug-2021 20:40:35 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 39
Sample Info: CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	999826	1014281			101.4	50 - 150
8 PFBA			1000.00	993.02	99.3	70 - 130
21 PFPeA			1000.00	972.39	97.2	70 - 130
D 50 13C5_PFPeA	977053	1031920			105.6	50 - 150
D 44 13C3_PFBS	311684	317930			102	50 - 150
7 PFBS			884.00	882.86	99.9	70 - 130
1 4:2 FTS			934.00	896.29	96	70 - 130
D 63 13C2_4:2 FTS_2	271879	301403			110.9	50 - 150
D 49 13C5_PFHxA	896581	892404			99.5	50 - 150
15 PFHxA			1000.00	879.73	88	70 - 130
22 PFPeS			938.00	915.10	97.6	70 - 130
28 GenX			2000.00	1834.53	91.7	70 - 130
D 66 13C3_GenX	743365	691587			93	50 - 150
D 47 13C4_PFHpA	959428	883808			92.1	50 - 150
13 PFHpA			1000.00	1019.10	101.9	70 - 130
D 45 13C3_PFHxS	255345	261581			102.4	50 - 150
14 PFHxS			910.00	859.71	94.5	70 - 130
29 ADONA			942.00	848.74	90.1	70 - 130
D 64 13C2_6:2 FTS_2	260845	254061			97.4	50 - 150
2 6:2 FTS			948.00	968.95	102.2	70 - 130
20 PFOA			1000.00	955.14	95.5	70 - 130
D 53 13C8_PFOA	932336	919201			98.6	50 - 150
12 PFHpS			952.00	882.65	92.7	70 - 130
18 PFOS			928.00	971.22	104.7	70 - 130
D 54 13C8_PFOS	244442	198726			81.3	50 - 150
D 56 13C9_PFNA	971716	869712			89.5	50 - 150
17 PFNA			1000.00	986.90	98.7	70 - 130
30 9Cl-PF3ONS			932.00	991.56	106.4	70 - 130
D 55 13C8_PFOSA	424585	402371			94.8	50 - 150
19 PFOSA			1000.00	956.89	95.7	70 - 130
16 PFNS			960.00	1015.02	105.7	70 - 130
D 65 13C2_8:2 FTS_2	230058	220026			95.6	50 - 150
3 8:2 FTS			958.00	839.65	87.6	70 - 130
D 51 13C6_PFDA	836645	804746			96.2	50 - 150
10 PFDA			1000.00	1001.84	100.2	70 - 130
D 58 d3-MeFOSAA	1090816	1103320			101.1	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	982.61	98.3	70 - 130
9 PFDS			964.00	1226.07	127.2	70 - 130
25 PFUdA			1000.00	974.06	97.4	70 - 130
D 60 d5-EtFOSAA	982624	1037393			105.6	50 - 150
D 52 13C7_PFUdA	709992	777538			109.5	50 - 150
5 N-EtFOSAA			1000.00	942.34	94.2	70 - 130
D 61 d7-MeFOSE	145559	145962			100.3	50 - 150
D 57 d3-MeFOSA	56405	58379			103.5	50 - 150
32 MeFOSE			1000.00	958.26	95.8	70 - 130
26 MeFOSA			1000.00	1037.80	103.8	70 - 130
31 11Cl-PF3OUDS			942.00	1027.75	109.1	70 - 130
D 62 d9-EtFOSE	140913	135935			96.5	50 - 150
33 EtFOSE			1000.00	961.99	96.2	70 - 130
D 59 d5-EtFOSA	54516	56129			103	50 - 150
27 EtFOSA			1000.00	1036.80	103.7	70 - 130
D 38 13C2_PFDoA	729865	664359			91	50 - 150
11 PFDoA			1000.00	959.05	95.9	70 - 130
4 10:2 FTS			964.00	950.73	98.6	70 - 130
34 PFDOS			968.00	989.71	102.2	70 - 130
24 PFTrDA			1000.00	1177.14	117.7	70 - 130
D 42 13C2_PFTeDA	900998	889426			98.7	50 - 150
23 PFTeDA			1000.00	1032.90	103.3	70 - 130
D 40 13C2_PFHxDA	488344	439494			90	50 - 150
35 PFHxDA			1000.00	979.10	97.9	70 - 130
36 PFODA			1000.00	993.82	99.4	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521051.d
Injection Date: 15-Aug-2021 20:40:35 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 39
Sample Info: CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.702	1.720	0	1014281	21	>100:1			1000.00	973.25	101.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.720	0/0	1047184	20	>100:1			1000.00	993.02		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.088	0	1031920	17	>100:1			1000.00	1016.98	105.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.088	0/0	1076789	16	>100:1			1000.00	972.39		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.141	0	317930	16	>100:1			1000.00	1025.34	102	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.141	0/0	364403	16	>100:1	Target = 3.62		884.00	882.86		
298.9 > 99	44	2.120	2.141		94185	16	>100:1	3.86 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.467	2.494	0/0	274455	18	>100:1	Target = 3.24		938.00	915.10		
349 > 99	44	2.467	2.494		86631	18	>100:1	3.16 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.398	2.415	0	301403	19	>100:1			5000.00	5232.96	110.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.398	2.415	0/0	102799	18	>100:1	Target = 1.40		934.00	896.29		
327 > 81	63	2.389	2.415		69263	20	>100:1	1.48 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.459	0	892404	18	>100:1			1000.00	1003.90	99.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.459	0/0	785463	18	>100:1	Target = 16.70		1000.00	879.73		
313 > 119	49	2.433	2.459		50805	19	>100:1	15.46 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.554	2.587	0	691587	18	>100:1			5000.00	5463.00	93	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.554	2.579	0/0	220852	18	>100:1	Target = 0.81		2000.00	1834.53		
285 > 185	66	2.554	2.579		325549	19	>100:1	0.67 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.820	2.848	0	883808	17	>100:1			1000.00	967.17	92.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.820	2.848	0/0	805401	18	>100:1	Target = 3.14		1000.00	1019.10		
363 > 169	47	2.820	2.848		247896	19	>100:1	3.24 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.837	2.865	0	261581	18	>100:1			1000.00	1055.56	102.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.837	2.865	0/0	262750	26	>100:1	Target = 3.29	0.17	910.00	859.71		
399 > 99	45	2.837	2.865		75414	25	>100:1	3.48 (1.64-4.94)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.863	2.883	0/0	1314701	19	>100:1	Target = 2.66		942.00	848.74		
377 > 85	45	2.863	2.883		512826	19	>100:1	2.56 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.204	3.231	0/0	233637	21	>100:1	Target = 3.57		952.00	882.65		
449 > 99	45	3.204	3.231		64973	21	>100:1	3.59 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.172	3.211	0	254061	22	>100:1			5000.00	5063.25	97.4	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.172	3.205	0/0	94386	24	>100:1	Target = 1.53		948.00	968.95		
427 > 81	64	3.172	3.205		62205	22	>100:1	1.51 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.198	3.231	0	919201	22	>100:1			1000.00	1012.98	98.6	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.204	3.243	0/0	879922	23	>100:1	Target = 2.76		1000.00	955.14		
413 > 169	53	3.204	3.243		325105	23	>100:1	2.70 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.565	3.613	0	198726	20	>100:1			1000.00	892.50	81.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.565	3.613	-2/-2	218052	38	>100:1	Target = 3.99	0.24	928.00	971.22		
499 > 99	54	3.573	3.613		56816	36	>100:1	3.83 (1.99-5.98)	0.07				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.775	3.810	0/0	596983	20	>100:1			932.00	991.56		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.908	3.946	0/0	178177	18	>100:1	Target = 3.23		960.00	1015.02		
549 > 99	54	3.908	3.946		54956	18	>100:1	3.24 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.208	4.252	0/0	232581	16	>100:1	Target = 3.16		964.00	1226.07		
599 > 99	54	4.208	4.252		62793	14	>100:1	3.70 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.365	4.407	0/0	499862	15	>100:1			942.00	1027.75		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.713	4.762	0/0	141326	18	>100:1	Target = 3.30		968.00	989.71		
699 > 99	54	4.713	4.762		42375	26	>100:1	3.33 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.573	3.613	0	869712	21	>100:1			1000.00	1003.98	89.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.573	3.613	0/0	775814	21	>100:1	Target = 5.07		1000.00	986.90		
463 > 169	56	3.573	3.613		172459	21	>100:1	4.49 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.848	3.869	0	402371	20	>100:1			1000.00	940.07	94.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.856	3.862	0/0	420864	18	>100:1	Target = 39.40		1000.00	956.89		
498>478	55	3.848	3.862		10897	21	61:1	38.62 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.916	3.954	0	220026	18	>100:1			5000.00	4878.13	95.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.908	3.963	0/0	65519	18	>100:1	Target = 1.43		958.00	839.65		
527 > 81	65	3.908	3.963		45034	24	>100:1	1.45 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.505	4.553	0/0	81342	17	>100:1	Target = 2.34		964.00	950.73		
627 > 80	65	4.505	4.553		32770	17	>100:1	2.48 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.916	3.963	0	804746	19	>100:1			1000.00	1049.81	96.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.916	3.963	0/0	765273	19	>100:1	Target = 10.17		1000.00	1001.84		
513 > 169	51	3.916	3.963		76621	19	>100:1	9.98 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.069	4.116	0	1103320	16	>100:1			5000.00	5445.41	101.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.077	4.124	-2/-2	178915	34	>100:1	Target = 1.51	0.07	1000.00	982.61		M
570 > 483	58	4.077	4.124		117525	33	>100:1	1.52 (0.75-2.27)	0.23				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.225	4.271	0	777538	18	>100:1			1000.00	1097.13	109.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.225	4.271	0/0	695584	17	>100:1	Target = 9.80		1000.00	974.06		
563 > 169	52	4.225	4.271		66411	19	>100:1	10.47 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.225	4.271	0	1037393	16	>100:1			5000.00	5758.53	105.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.235	4.290	-3/-3	205552	32	>100:1	Target = 1.83		1000.00	942.34		M
584 > 526	60	4.235	4.290		123576	31	>100:1	1.66 (0.91-2.75)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.272	4.271	0	145962	17	>100:1			1000.00	1075.04	100.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.282	4.280	0/0	140883	15	>100:1			1000.00	958.26		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.291	4.290	0	58379	15	>100:1			1000.00	970.29	103.5	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.291	4.299	0/0	65923	14	78:1	Target = 1.13		1000.00	1037.80		
512 > 219	57	4.291	4.299		58170	15	>100:1	1.13 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.429	4.435	0	135935	26	>100:1			1000.00	1035.42	96.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.442	4.441	0/0	95739	17	>100:1			1000.00	961.99		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.456	4.455	0	56129	25	>100:1			1000.00	956.38	103	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.456	4.455	0/0	63594	19	>100:1	Target = 1.10		1000.00	1036.80		
526 > 219	59	4.464	4.455		57602	19	>100:1	1.10 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.497	4.545	0	664359	17	>100:1			1000.00	939.44	91	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.497	4.545	0/0	625265	16	>100:1	Target = 7.70		1000.00	959.05		
613 > 169	38	4.497	4.545		84240	16	>100:1	7.42 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.738	4.785	0/0	324445	19	>100:1	Target = 3.41		1000.00	1177.14		
663 > 169	38	4.738	4.785		92628	19	>100:1	3.50 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.956	5.014	0	889426	16	>100:1			1000.00	1036.60	98.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.956	5.014	0/0	770724	17	>100:1	Target = 9.31		1000.00	1032.90		
713 > 169	42	4.956	5.014		83405	18	>100:1	9.24 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.347	5.425	0	439494	16	>100:1			1000.00	1152.09	90	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.347	5.425	0/0	745339	18	68:1	Target = 13.26		1000.00	979.10		
813 > 269	40	5.347	5.425		56815	18	>100:1	13.11 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.729	5.840	0/0	451683	22	62:1	Target = 99.70		1000.00	993.82		
913 > 319	40	5.729	5.840		4571	23	>100:1	98.81 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.916	3.963	0	778558	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.459	0	870815	19	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.204	3.237	0	904043	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.702	1.720	0	967319	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.573	3.606	0	226711	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521066.d
Injection Date: 15-Aug-2021 23:19:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 53
Sample Info: CCV 1000C_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	999826	1049741			105	50 - 150
8 PFBA			1000.00	1002.10	100.2	70 - 130
21 PFPeA			1000.00	952.07	95.2	70 - 130
D 50 13C5_PFPeA	977053	1063648			108.9	50 - 150
D 44 13C3_PFBS	311684	316533			101.6	50 - 150
7 PFBS			884.00	847.58	95.9	70 - 130
1 4:2 FTS			934.00	847.61	90.8	70 - 130
D 63 13C2_4:2 FTS_2	271879	306582			112.8	50 - 150
D 49 13C5_PFHxA	896581	888614			99.1	50 - 150
15 PFHxA			1000.00	982.63	98.3	70 - 130
22 PFPeS			938.00	942.47	100.5	70 - 130
28 GenX			2000.00	1941.80	97.1	70 - 130
D 66 13C3_GenX	743365	673441			90.6	50 - 150
D 47 13C4_PFHpA	959428	979933			102.1	50 - 150
13 PFHpA			1000.00	1001.29	100.1	70 - 130
D 45 13C3_PFHxS	255345	253639			99.3	50 - 150
14 PFHxS			910.00	960.56	105.6	70 - 130
29 ADONA			942.00	917.86	97.4	70 - 130
D 64 13C2_6:2 FTS_2	260845	262971			100.8	50 - 150
2 6:2 FTS			948.00	997.11	105.2	70 - 130
20 PFOA			1000.00	1033.03	103.3	70 - 130
D 53 13C8_PFOA	932336	914282			98.1	50 - 150
12 PFHpS			952.00	930.15	97.7	70 - 130
18 PFOS			928.00	851.77	91.8	70 - 130
D 54 13C8_PFOS	244442	222414			91	50 - 150
D 56 13C9_PFNA	971716	809291			83.3	50 - 150
17 PFNA			1000.00	1085.06	108.5	70 - 130
30 9Cl-PF3ONS			932.00	874.15	93.8	70 - 130
D 55 13C8_PFOSA	424585	414962			97.7	50 - 150
19 PFOSA			1000.00	941.11	94.1	70 - 130
16 PFNS			960.00	873.71	91	70 - 130
D 65 13C2_8:2 FTS_2	230058	216034			93.9	50 - 150
3 8:2 FTS			958.00	1014.90	105.9	70 - 130
D 51 13C6_PFDA	836645	750461			89.7	50 - 150
10 PFDA			1000.00	1054.30	105.4	70 - 130
D 58 d3-MeFOSAA	1090816	1078725			98.9	50 - 150

Report Date: 16-Aug-2021 13:05:05 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521066.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	928.62	92.9	70 - 130
9 PFDS			964.00	887.64	92.1	70 - 130
25 PFUdA			1000.00	976.07	97.6	70 - 130
D 60 d5-EtFOSAA	982624	1051990			107.1	50 - 150
D 52 13C7_PFUdA	709992	766765			108	50 - 150
5 N-EtFOSAA			1000.00	1001.44	100.1	70 - 130
D 61 d7-MeFOSE	145559	142559			97.9	50 - 150
D 57 d3-MeFOSA	56405	60839			107.9	50 - 150
32 MeFOSE			1000.00	1043.44	104.3	70 - 130
26 MeFOSA			1000.00	961.09	96.1	70 - 130
31 11Cl-PF3OUDS			942.00	949.03	100.7	70 - 130
D 62 d9-EtFOSE	140913	130562			92.7	50 - 150
33 EtFOSE			1000.00	1040.94	104.1	70 - 130
D 59 d5-EtFOSA	54516	49711			91.2	50 - 150
27 EtFOSA			1000.00	1060.80	106.1	70 - 130
D 38 13C2_PFDoA	729865	637270			87.3	50 - 150
11 PFDoA			1000.00	1129.35	112.9	70 - 130
4 10:2 FTS			964.00	1038.56	107.7	70 - 130
34 PFDOS			968.00	933.25	96.4	70 - 130
24 PFTrDA			1000.00	1228.01	122.8	70 - 130
D 42 13C2_PFTeDA	900998	885347			98.3	50 - 150
23 PFTeDA			1000.00	1013.18	101.3	70 - 130
D 40 13C2_PFHxDA	488344	439612			90	50 - 150
35 PFHxDA			1000.00	912.70	91.3	70 - 130
36 PFODA			1000.00	989.65	99	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521066.d
Injection Date: 15-Aug-2021 23:19:38 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 53
Sample Info: CCV 1000C_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.720	1	1049741	20	>100:1			1000.00	1007.28	105	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.720	1/0	1093711	22	>100:1			1000.00	1002.10		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.088	1	1063648	16	>100:1			1000.00	1048.25	108.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.088	1/0	1086700	16	>100:1			1000.00	952.07		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.141	1	316533	15	>100:1			1000.00	1020.84	101.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.141	1/0	348305	16	>100:1	Target = 3.62		884.00	847.58		
298.9 > 99	44	2.120	2.141		97750	16	>100:1	3.56 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.467	2.494	1/0	281424	18	>100:1	Target = 3.24		938.00	942.47		
349 > 99	44	2.467	2.494		85897	19	>100:1	3.27 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.389	2.415	0	306582	17	>100:1			5000.00	5322.88	112.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.389	2.415	0/0	98886	19	>100:1	Target = 1.40		934.00	847.61		
327 > 81	63	2.389	2.415		70493	19	>100:1	1.40 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.459	0	888614	18	>100:1			1000.00	999.64	99.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.459	1/1	873613	18	>100:1	Target = 16.70		1000.00	982.63		
313 > 119	49	2.433	2.459		50512	17	>100:1	17.29 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.554	2.587	1	673441	18	>100:1			5000.00	5319.66	90.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.554	2.579	1/0	227633	19	>100:1	Target = 0.81		2000.00	1941.80		
285 > 185	66	2.554	2.579		284748	16	>100:1	0.79 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.811	2.848	0	979933	19	>100:1			1000.00	1072.36	102.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.811	2.848	0/0	877388	18	>100:1	Target = 3.14		1000.00	1001.29		
363 > 169	47	2.811	2.848		282585	18	>100:1	3.10 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.828	2.865	0	253639	19	>100:1			1000.00	1023.51	99.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.837	2.865	1/1	284662	25	>100:1	Target = 3.29	0.14	910.00	960.56		
399 > 99	45	2.828	2.865		70186	23	>100:1	4.05 (1.64-4.94)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.855	2.883	0/0	1378615	18	>100:1	Target = 2.66		942.00	917.86		
377 > 85	45	2.855	2.883		509270	18	>100:1	2.70 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.202	3.231	0/0	238733	23	>100:1	Target = 3.57		952.00	930.15		
449 > 99	45	3.202	3.231		67243	22	>100:1	3.55 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.170	3.211	0	262971	22	>100:1			5000.00	5240.82	100.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.164	3.205	0/0	100535	23	>100:1	Target = 1.53		948.00	997.11		
427 > 81	64	3.164	3.205		64017	21	>100:1	1.57 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.189	3.231	0	914282	23	>100:1			1000.00	1007.56	98.1	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.196	3.243	0/0	946587	22	>100:1	Target = 2.76		1000.00	1033.03		
413 > 169	53	3.189	3.243		338956	22	>100:1	2.79 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.562	3.613	0	222414	19	>100:1			1000.00	998.89	91	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.562	3.613	0/0	214029	38	>100:1	Target = 3.99	0.26	928.00	851.77		
499 > 99	54	3.562	3.613		56010	37	>100:1	3.82 (1.99-5.98)	0.14				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.766	3.810	0/0	589027	20	>100:1			932.00	874.15		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.891	3.946	-1/-1	171654	17	>100:1	Target = 3.23		960.00	873.71		
549 > 99	54	3.891	3.946		58771	16	>100:1	2.92 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.188	4.252	-1/-1	188452	17	>100:1	Target = 3.16		964.00	887.64		
599 > 99	54	4.188	4.252		62547	15		3.01 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.353	4.407	0/0	516595	15	>100:1			942.00	949.03		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.697	4.762	0/0	149149	19	>100:1	Target = 3.30		968.00	933.25		
699 > 99	54	4.697	4.762		43436	16	>100:1	3.43 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.562	3.613	0	809291	20	>100:1			1000.00	934.23	83.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.569	3.613	0/0	793720	20	>100:1	Target = 5.07		1000.00	1085.06		
463 > 169	56	3.569	3.613		168453	19	>100:1	4.71 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.846	3.869	0	414962	20	>100:1			1000.00	969.49	97.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.839	3.862	0/0	426877	17	>100:1	Target = 39.40		1000.00	941.11		
498>478	55	3.846	3.862		12450	18	>100:1	34.28 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.899	3.954	-1	216034	17	>100:1			5000.00	4789.62	93.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.899	3.963	0/1	77757	17	>100:1	Target = 1.43		958.00	1014.90		
527 > 81	65	3.899	3.963		53433	18	>100:1	1.45 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.494	4.553	0/1	87244	16		Target = 2.34		964.00	1038.56		
627 > 80	65	4.494	4.553		34148	19		2.55 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.906	3.963	0	750461	19	>100:1			1000.00	978.99	89.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.906	3.963	0/0	751017	18	>100:1	Target = 10.17		1000.00	1054.30		
513 > 169	51	3.906	3.963		69790	19	>100:1	10.76 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.056	4.116	0	1078725	16	>100:1			5000.00	5324.02	98.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.066	4.124	-3/-3	165316	37	>100:1	Target = 1.51	0.08	1000.00	928.62		M
570 > 483	58	4.066	4.124		115637	30	>100:1	1.42 (0.75-2.27)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.214	4.271	0	766765	15	>100:1			1000.00	1081.93	108	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.214	4.271	0/0	687365	17	>100:1	Target = 9.80		1000.00	976.07		
563 > 169	52	4.214	4.271		66687	16	>100:1	10.30 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.214	4.271	0	1051990	17	>100:1			5000.00	5839.56	107.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.222	4.290	-4/-4	221517	36	>100:1	Target = 1.83		1000.00	1001.44		M
584 > 526	60	4.222	4.290		108552	31	>100:1	2.04 (0.91-2.75)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.260	4.271	0	142559	14	>100:1			1000.00	1049.98	97.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.270	4.280	0/0	149829	16	>100:1			1000.00	1043.44		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.279	4.290	0	60839	14	>100:1			1000.00	1011.18	107.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.279	4.299	0/0	63623	14	>100:1	Target = 1.13		1000.00	961.09		
512 > 219	57	4.279	4.299		56046	16	>100:1	1.13 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.419	4.435	0	130562	19	>100:1			1000.00	994.50	92.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.433	4.441	0/0	99502	16	>100:1			1000.00	1040.94		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.440	4.455	0	49711	16	>100:1			1000.00	847.02	91.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.446	4.455	0/0	57626	15	>100:1	Target = 1.10		1000.00	1060.80		
526 > 219	59	4.446	4.455		56738	15	>100:1	1.01 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.478	4.545	-1	637270	17	>100:1			1000.00	901.13	87.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.486	4.545	0/1	706272	18	>100:1	Target = 7.70		1000.00	1129.35		
613 > 169	38	4.486	4.545		98077	20	>100:1	7.20 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.724	4.785	0/1	324665	18	>100:1	Target = 3.41		1000.00	1228.01		
663 > 169	38	4.717	4.785		91907	18	>100:1	3.53 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.943	5.014	0	885347	16	>100:1			1000.00	1031.84	98.3	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.943	5.014	0/0	752545	18	>100:1	Target = 9.31		1000.00	1013.18		
713 > 169	42	4.943	5.014		79026	17	>100:1	9.52 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.326	5.425	-1	439612	17	>100:1			1000.00	1152.40	90	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.326	5.425	-1/0	694973	17	70:1	Target = 13.26		1000.00	912.70		
813 > 269	40	5.326	5.425		54877	16	>100:1	12.66 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.704	5.840	-1/0	449909	23	54:1	Target = 99.70		1000.00	989.65		
913 > 319	40	5.704	5.840		4767	28	>100:1	94.37 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.906	3.963	0	827665	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.433	2.459	0	832631	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.196	3.237	0	928196	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.720	1	1021991	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.562	3.606	0	227371	20	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521073.d
Injection Date: 16-Aug-2021 00:34:01 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 59
Sample Info: CCV 1000D_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	999826	912512			91.3	50 - 150
8 PFBA			1000.00	971.84	97.2	70 - 130
21 PFPeA			1000.00	981.06	98.1	70 - 130
D 50 13C5_PFPeA	977053	900643			92.2	50 - 150
D 44 13C3_PFBS	311684	260880			83.7	50 - 150
7 PFBS			884.00	883.36	99.9	70 - 130
1 4:2 FTS			934.00	991.40	106.1	70 - 130
D 63 13C2_4:2 FTS_2	271879	264828			97.4	50 - 150
D 49 13C5_PFHxA	896581	784580			87.5	50 - 150
15 PFHxA			1000.00	1024.05	102.4	70 - 130
22 PFPeS			938.00	1016.95	108.4	70 - 130
28 GenX			2000.00	1801.14	90.1	70 - 130
D 66 13C3_GenX	743365	612328			82.4	50 - 150
D 47 13C4_PFHpA	959428	849186			88.5	50 - 150
13 PFHpA			1000.00	954.97	95.5	70 - 130
D 45 13C3_PFHxS	255345	219358			85.9	50 - 150
14 PFHxS			910.00	926.17	101.8	70 - 130
29 ADONA			942.00	928.29	98.5	70 - 130
D 64 13C2_6:2 FTS_2	260845	213350			81.8	50 - 150
2 6:2 FTS			948.00	1069.45	112.8	70 - 130
20 PFOA			1000.00	883.31	88.3	70 - 130
D 53 13C8_PFOA	932336	888892			95.3	50 - 150
12 PFHpS			952.00	903.94	95	70 - 130
18 PFOS			928.00	888.54	95.7	70 - 130
D 54 13C8_PFOS	244442	193419			79.1	50 - 150
D 56 13C9_PFNA	971716	857898			88.3	50 - 150
17 PFNA			1000.00	956.45	95.6	70 - 130
30 9Cl-PF3ONS			932.00	836.09	89.7	70 - 130
D 55 13C8_PFOSA	424585	346884			81.7	50 - 150
19 PFOSA			1000.00	1076.14	107.6	70 - 130
16 PFNS			960.00	971.45	101.2	70 - 130
D 65 13C2_8:2 FTS_2	230058	210375			91.4	50 - 150
3 8:2 FTS			958.00	989.44	103.3	70 - 130
D 51 13C6_PFDA	836645	721582			86.2	50 - 150
10 PFDA			1000.00	1205.77	120.6	70 - 130
D 58 d3-MeFOSAA	1090816	959101			87.9	50 - 150

Report Date: 16-Aug-2021 13:05:15 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521073.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1046.56	104.7	70 - 130
9 PFDS			964.00	993.98	103.1	70 - 130
25 PFUdA			1000.00	923.10	92.3	70 - 130
D 60 d5-EtFOSAA	982624	910216			92.6	50 - 150
D 52 13C7_PFUdA	709992	698935			98.4	50 - 150
5 N-EtFOSAA			1000.00	1015.46	101.5	70 - 130
D 61 d7-MeFOSE	145559	116818			80.3	50 - 150
D 57 d3-MeFOSA	56405	53670			95.2	50 - 150
32 MeFOSE			1000.00	1025.55	102.6	70 - 130
26 MeFOSA			1000.00	981.16	98.1	70 - 130
31 11Cl-PF3OUDS			942.00	973.79	103.4	70 - 130
D 62 d9-EtFOSE	140913	110267			78.3	50 - 150
33 EtFOSE			1000.00	970.19	97	70 - 130
D 59 d5-EtFOSA	54516	48162			88.3	50 - 150
27 EtFOSA			1000.00	1035.37	103.5	70 - 130
D 38 13C2_PFDoA	729865	635282			87	50 - 150
11 PFDoA			1000.00	1020.48	102	70 - 130
4 10:2 FTS			964.00	885.38	91.8	70 - 130
34 PFDOS			968.00	937.30	96.8	70 - 130
24 PFTrDA			1000.00	1043.92	104.4	70 - 130
D 42 13C2_PFTeDA	900998	776725			86.2	50 - 150
23 PFTeDA			1000.00	996.37	99.6	70 - 130
D 40 13C2_PFHxDA	488344	381799			78.2	50 - 150
35 PFHxDA			1000.00	934.38	93.4	70 - 130
36 PFODA			1000.00	998.16	99.8	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\081521-DOD.b\081521073.d
Injection Date: 16-Aug-2021 00:34:01 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 59
Sample Info: CCV 1000D_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.708	1.720	1	912512	20	>100:1			1000.00	875.60	91.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.708	1.720	1/0	922024	21	>100:1			1000.00	971.84		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.068	2.088	1	900643	16	>100:1			1000.00	887.61	92.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.068	2.088	1/0	948181	16	>100:1			1000.00	981.06		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.120	2.141	1	260880	16	>100:1			1000.00	841.35	83.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.120	2.141	1/0	299183	16	>100:1	Target = 3.62		884.00	883.36		
298.9 > 99	44	2.120	2.141		84858	18	>100:1	3.52 (1.81-5.43)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.467	2.494	1/0	250272	20	>100:1	Target = 3.24		938.00	1016.95		
349 > 99	44	2.467	2.494		73217	18	>100:1	3.41 (1.62-4.86)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.389	2.415	0	264828	19	>100:1			5000.00	4597.94	97.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.389	2.415	0/0	99909	19		Target = 1.40		934.00	991.40		
327 > 81	63	2.389	2.415		61717	21	>100:1	1.61 (0.70-2.10)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.433	2.459	0	784580	18	>100:1			1000.00	882.61	87.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.433	2.459	1/1	803843	19	>100:1	Target = 16.70		1000.00	1024.05		
313 > 119	49	2.433	2.459		42763	18	>100:1	18.79 (8.35-25.06)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.554	2.587	1	612328	18	>100:1			5000.00	4836.91	82.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.554	2.579	1/0	191982	19	>100:1	Target = 0.81		2000.00	1801.14		
285 > 185	66	2.554	2.579		253754	19	>100:1	0.75 (0.40-1.22)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.811	2.848	0	849186	18	>100:1			1000.00	929.28	88.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.811	2.848	0/0	725155	17	>100:1	Target = 3.14		1000.00	954.97		
363 > 169	47	2.811	2.848		233934	17	>100:1	3.09 (1.57-4.72)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.828	2.865	0	219358	18				1000.00	885.18	85.9	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.828	2.865	0/0	237373	27	>100:1	Target = 3.29	0.19	910.00	926.17		
399 > 99	45	2.828	2.865		53558	18	>100:1	4.43 (1.64-4.94)					

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.855	2.883	0/0	1205828	18	>100:1	Target = 2.66		942.00	928.29		
377 > 85	45	2.855	2.883		454940	20	>100:1	2.65 (1.33-3.99)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.196	3.231	0/0	200649	23	>100:1	Target = 3.57		952.00	903.94		
449 > 99	45	3.189	3.231		62680	22	>100:1	3.20 (1.78-5.36)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.164	3.211	0	213350	21	>100:1			5000.00	4251.91	81.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.164	3.205	0/0	87482	27	>100:1	Target = 1.53		948.00	1069.45		
427 > 81	64	3.164	3.205		54594	21	>100:1	1.60 (0.76-2.30)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.189	3.231	0	888892	22	>100:1			1000.00	979.58	95.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.189	3.243	0/0	786917	21	>100:1	Target = 2.76		1000.00	883.31		
413 > 169	53	3.196	3.243		302995	22	>100:1	2.59 (1.38-4.14)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.554	3.613	0	193419	20	>100:1			1000.00	868.67	79.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.554	3.613	0/0	194160	37	>100:1	Target = 3.99	0.25	928.00	888.54		
499 > 99	54	3.547	3.613		52284	31	>100:1	3.71 (1.99-5.98)	0.11				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.753	3.810	-1/-1	489936	21	>100:1			932.00	836.09		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.884	3.946	-1/-1	165974	20	>100:1	Target = 3.23		960.00	971.45		
549 > 99	54	3.892	3.946		49117	18	>100:1	3.37 (1.61-4.85)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.189	4.252	-1/-1	183518	17	>100:1	Target = 3.16		964.00	993.98		
599 > 99	54	4.189	4.252		52512	16	>100:1	3.49 (1.58-4.74)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.344	4.407	-1/-1	460974	15	>100:1			942.00	973.79		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.689	4.762	-1/-1	130268	18	>100:1	Target = 3.30		968.00	937.30		
699 > 99	54	4.689	4.762		38524	18	>100:1	3.38 (1.65-4.96)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.554	3.613	-1	857898	20	>100:1			1000.00	990.35	88.3	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.562	3.613	0/1	741667	19	>100:1	Target = 5.07		1000.00	956.45		
463 > 169	56	3.569	3.613		130263	22	>100:1	5.69 (2.53-7.60)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.832	3.869	0	346884	18	>100:1			1000.00	810.43	81.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.832	3.862	-1/-1	408044	19	>100:1	Target = 39.40		1000.00	1076.14		
498>478	55	3.832	3.862		11633	21		35.07 (19.70-59.11)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.892	3.954	-1	210375	18	>100:1			5000.00	4664.16	91.4	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.892	3.963	0/1	73821	17	>100:1	Target = 1.43		958.00	989.44		
527 > 81	65	3.892	3.963		43414	17	>100:1	1.70 (0.71-2.14)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.486	4.553	-1/0	72428	18		Target = 2.34		964.00	885.38		
627 > 80	65	4.486	4.553		30041	19	>100:1	2.41 (1.17-3.51)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.899	3.963	0	721582	19	>100:1			1000.00	941.32	86.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.899	3.963	0/0	825863	17	>100:1	Target = 10.17		1000.00	1205.77		
513 > 169	51	3.907	3.963		53346	17	>100:1	15.48 (5.08-15.25)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.056	4.116	0	959101	16	>100:1			5000.00	4733.62	87.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.056	4.124	-4/-4	165650	35	>100:1	Target = 1.51	0.07	1000.00	1046.56		M
570 > 483	58	4.056	4.124		99480	35	>100:1	1.66 (0.75-2.27)	0.28				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.205	4.271	-1	698935	16	>100:1			1000.00	986.22	98.4	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.205	4.271	-1/0	592552	18	>100:1	Target = 9.80		1000.00	923.10		
563 > 169	52	4.205	4.271		55514	17	>100:1	10.67 (4.90-14.70)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.205	4.271	-1	910216	17	>100:1			5000.00	5052.57	92.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.214	4.290	-4/-3	194347	35	>100:1	Target = 1.83		1000.00	1015.46		M
584 > 526	60	4.214	4.290		103414	34	>100:1	1.87 (0.91-2.75)	0.05				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.251	4.271	-1	116818	17	>100:1			1000.00	860.39	80.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.260	4.280	-1/0	120670	16	>100:1			1000.00	1025.55		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.270	4.290	-1	53670	14	>100:1			1000.00	892.03	95.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.270	4.299	-1/0	57298	19	83:1	Target = 1.13		1000.00	981.16		
512 > 219	57	4.270	4.299		45386	16	>100:1	1.26 (0.56-1.70)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.412	4.435	0	110267	16	>100:1			1000.00	839.91	78.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.426	4.441	0/0	78323	15	>100:1			1000.00	970.19		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.433	4.455	-1	48162	23	>100:1			1000.00	820.63	88.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.440	4.455	0/1	54492	23	>100:1	Target = 1.10		1000.00	1035.37		
526 > 219	59	4.440	4.455		51097	19	>100:1	1.06 (0.55-1.65)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.478	4.545	-1	635282	17	>100:1			1000.00	898.32	87	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.478	4.545	-1/0	636195	17	>100:1	Target = 7.70		1000.00	1020.48		
613 > 169	38	4.478	4.545		79459	18	>100:1	8.00 (3.85-11.55)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.718	4.785	-1/0	275134	18	>100:1	Target = 3.41		1000.00	1043.92		
663 > 169	38	4.711	4.785		77673	18	>100:1	3.54 (1.70-5.12)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.935	5.014	-1	776725	16	>100:1			1000.00	905.25	86.2	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	4.935	5.014	-1/0	649260	16	>100:1	Target = 9.31		1000.00	996.37		
713 > 169	42	4.935	5.014		66291	18	>100:1	9.79 (4.65-13.97)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.326	5.425	-1	381799	16	>100:1			1000.00	1000.85	78.2	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.326	5.425	-1/0	617917	17	70:1	Target = 13.26		1000.00	934.38		
813 > 269	40	5.326	5.425		50165	17	>100:1	12.31 (6.63-19.90)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.696	5.840	-1/0	394099	22	60:1	Target = 99.70		1000.00	998.16		
913 > 319	40	5.704	5.840		3640	22	>100:1	108.26 (49.85-149.55)					
*** 37 13C2_PFDA**													
515 > 470		3.899	3.963	0	685941	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.433	2.459	0	756065	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.189	3.237	0	850809	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.708	1.720	1	881975	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.554	3.606	-1	195468	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621005.d
Injection Date: 16-Aug-2021 13:03:50 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	114.20	114.2	70 - 130
D 46 13C4_PFBA	574801	553436			96.3	50 - 150
D 50 13C5_PFPeA	538043	516955			96.1	50 - 150
21 PFPeA			100.00	96.449	96.4	70 - 130
7 PFBS			88.400	94.332	106.7	70 - 130
D 44 13C3_PFBS	187099	164534			87.9	50 - 150
1 4:2 FTS			93.400	96.861	103.7	70 - 130
D 63 13C2_4:2 FTS_2	103169	118214			114.6	50 - 150
D 49 13C5_PFHxA	593317	552268			93.1	50 - 150
15 PFHxA			100.00	97.224	97.2	70 - 130
22 PFPeS			93.800	94.226	100.5	70 - 130
28 GenX			200.00	189.58	94.8	70 - 130
D 66 13C3_GenX	1107213	1119610			101.1	50 - 150
D 47 13C4_PFHpA	479053	455905			95.2	50 - 150
13 PFHpA			100.00	108.91	108.9	70 - 130
D 45 13C3_PFHxS	139557	127338			91.2	50 - 150
14 PFHxS			91.000	102.13	112.2	70 - 130
29 ADONA			94.200	104.37	110.8	70 - 130
D 64 13C2_6:2 FTS_2	86994	110710			127.3	50 - 150
2 6:2 FTS			94.800	91.776	96.8	70 - 130
D 53 13C8_PFOA	486725	472194			97	50 - 150
20 PFOA			100.00	86.998	87	70 - 130
12 PFHpS			95.200	88.194	92.6	70 - 130
18 PFOS			92.800	89.579	96.5	70 - 130
D 54 13C8_PFOS	130612	135402			103.7	50 - 150
17 PFNA			100.00	98.129	98.1	70 - 130
D 56 13C9_PFNA	580651	588924			101.4	50 - 150
30 9Cl-PF3ONS			93.200	95.899	102.9	70 - 130
D 55 13C8_PFOSA	268160	246128			91.8	50 - 150
19 PFOSA			100.00	95.054	95.1	70 - 130
16 PFNS			96.000	100.78	105	70 - 130
D 65 13C2_8:2 FTS_2	97398	496935			510.2	50 - 150
3 8:2 FTS			95.800	96.731	101	70 - 130
10 PFDA			100.00	89.792	89.8	70 - 130
D 51 13C6_PFDA	542953	731005			134.6	50 - 150
6 N-MeFOSAA			100.00	127.27	127.3	70 - 130

Report Date: 17-Aug-2021 18:17:13 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621005.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	596376	771140			129.3	50 - 150
9 PFDS			96.400	75.385	78.2	70 - 130
D 60 d5-EtFOSAA	592804	722676			121.9	50 - 150
D 52 13C7_PFUdA	631526	586419			92.9	50 - 150
5 N-EtFOSAA			100.00	106.95	106.9	70 - 130
25 PFUdA			100.00	98.347	98.3	70 - 130
D 61 d7-MeFOSE	89085	77726			87.2	50 - 150
32 MeFOSE			100.00	104.12	104.1	70 - 130
D 57 d3-MeFOSA	50589	49045			96.9	50 - 150
26 MeFOSA			100.00	86.133	86.1	70 - 130
31 11Cl-PF3OUDS			94.200	90.432	96	70 - 130
D 62 d9-EtFOSE	90529	89034			98.3	50 - 150
33 EtFOSE			100.00	106.43	106.4	70 - 130
D 59 d5-EtFOSA	43442	42128			97	50 - 150
27 EtFOSA			100.00	88.652	88.7	70 - 130
11 PFDoA			100.00	105.62	105.6	70 - 130
D 38 13C2_PFDoA	595792	621860			104.4	50 - 150
4 10:2 FTS			96.400	26.706	27.7	70 - 130
34 PFDOS			96.800	91.624	94.7	70 - 130
24 PFTrDA			100.00	112.99	113	70 - 130
23 PFTeDA			100.00	111.34	111.3	70 - 130
D 42 13C2_PFTeDA	902749	808961			89.6	50 - 150
35 PFHxDA			100.00	104.56	104.6	70 - 130
D 40 13C2_PFHxDA	845704	887847			105	50 - 150
36 PFODA			100.00	100.34	100.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621005.d
Injection Date: 16-Aug-2021 13:03:50 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1597 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.718	2	553436	20	>100:1			1000.00	996.41	96.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.718	1/-1	63166	23	14:1			100.00	114.20		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.099	2.099	2	516955	18	>100:1			1000.00	993.12	96.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.099	2.099	2/0	54364	15	65:1			100.00	96.449		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	2	164534	16	>100:1			1000.00	917.15	87.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	2/0	18505	16	>100:1	Target = 3.26		88.400	94.332		
298.9 > 99	44	2.151	2.151		5710	20	14:1	3.24 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.496	3/1	13912	21	95:1	Target = 3.15		93.800	94.226		
349 > 99	44	2.505	2.496		5152	18	27:1	2.70 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.425	2.425	3	118214	19	>100:1			5000.00	5916.50	114.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.434	2.434	3/0	4932	22	68:1	Target = 1.68		93.400	96.861		
327 > 81	63	2.443	2.434		2281	14	3.1:1	2.16 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.469	2.469	3	552268	17	>100:1			1000.00	944.21	93.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.469	2.469	3/0	56105	15	41:1	Target = 18.18		100.00	97.224		
313 > 119	49	2.469	2.469		3955	15	34:1	14.18 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.583	2.583	3	1119610	19	>100:1			5000.00	5199.81	101.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.583	2.583	3/0	29644	20	63:1	Target = 0.79		200.00	189.58		
285 > 185	66	2.583	2.583		42032	18	64:1	0.70 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.846	2.846	3	455905	19	>100:1			1000.00	942.48	95.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.846	2.846	3/0	55467	19	28:1	Target = 3.65		100.00	108.91		
363 > 169	47	2.846	2.846		14718	16	61:1	3.76 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.855	2.855	3	127338	18	>100:1			1000.00	948.34	91.2	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.855	2.855	0/-3	14245	28	60:1	Target = 3.10	0.21	91.000	102.13		
399 > 99	45	2.855	2.855		5329	20	21:1	2.67 (1.55-4.66)					M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.889	2.889	4/1	87559	19	>100:1	Target = 3.01		94.200	104.37		
377 > 85	45	2.889	2.889		28805	21	>100:1	3.03 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.240	3.240	4/1	10686	39	76:1	Target = 2.85		95.200	88.194		
449 > 99	45	3.233	3.240		4800	15	17:1	2.22 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.207	3.207	4	110710	21	>100:1			5000.00	6861.35	127.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.207	3.207	3/-1	4940	25	72:1	Target = 1.74		94.800	91.776		
427 > 81	64	3.220	3.207		3171	14	25:1	1.55 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.233	3.233	4	472194	21	>100:1			1000.00	1013.72	97	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.233	3.233	0/-4	40888	18	25:1	Target = 2.92		100.00	86.998		M
413 > 169	53	3.240	3.233		13798	19	70:1	2.96 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.608	3.608	4	135402	19	>100:1			1000.00	1017.81	103.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.616	3.616	0/-4	13748	32	54:1	Target = 3.34	0.13	92.800	89.579		M
499 > 99	54	3.616	3.616		3957	39	29:1	3.47 (1.67-5.02)	0.15				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.828	3.828	4/0	49246	18	>100:1			93.200	95.899		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.962	3.962	4/0	11167	22	45:1	Target = 2.63		96.000	100.78		
549 > 99	54	3.952	3.962		3933	11	16:1	2.83 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.264	4.264	4/0	8437	13	36:1	Target = 2.65		96.400	75.385		
599 > 99	54	4.284	4.264		3459	22	26:1	2.43 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.443	4.443	5/1	40731	25	>100:1			94.200	90.432		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.798	4.798	5/1	9287	21	>100:1	Target = 3.08		96.800	91.624		
699 > 99	54	4.798	4.798		3517	23		2.64 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.616	3.616	4	588924	21	>100:1			1000.00	1033.69	101.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.624	3.624	4/0	63562	24	96:1	Target = 6.55		100.00	98.129		
463 > 169	56	3.616	3.624		8296	20	16:1	7.66 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.869	3.869	2	246128	18	>100:1			1000.00	901.87	91.8	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.869	3.869	2/0	26210	18	93:1	Target = 33.36		100.00	95.054		
498>478	55	3.869	3.869		710	17	11:1	36.91 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.971	3.971	0	496935	15	>100:1			5000.00	26009	510.2*	M
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.971	3.971	4/-1	21531	15	>100:1	Target = 2.44		95.800	96.731		
527 > 81	65	3.971	3.971		12734	23	35:1	1.69 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.583	4.583	5/0	6851	17		Target = 3.72		96.400	26.706		
627 > 80	65	4.575	4.583		1725	13	11:1	3.97 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.981	3.981	5	731005	17	>100:1			1000.00	1339.23	134.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.971	3.971	4/-1	76278	17	42:1	Target = 13.09		100.00	89.792		
513 > 169	51	3.971	3.971		5823	10	30:1	13.09 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.139	4.139	5	771140	19	>100:1			5000.00	6164.44	129.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.139	4.139	0/-5	16074	27	>100:1	Target = 1.36	0.13	100.00	127.27		M
570 > 483	58	4.148	4.139		10886	36		1.47 (0.68-2.04)	0.25				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.294	4.294	4	586419	15	>100:1			1000.00	989.67	92.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.294	4.294	5/1	54596	13	>100:1	Target = 14.48		100.00	98.347		
563 > 169	52	4.304	4.294		3639	17	14:1	15.00 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.294	4.294	4	722676	16	>100:1			5000.00	6498.31	121.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.304	4.304	0/-4	16216	36	48:1	Target = 1.63		100.00	106.95		M
584 > 526	60	4.294	4.304		9538	25	59:1	1.70 (0.81-2.44)	0.20				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.294	4.294	1	77726	15	>100:1			1000.00	932.58	87.2	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.294	4.294	1/0	9118	18	29:1			100.00	104.12		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.315	4.315	2	49045	14	>100:1			1000.00	973.01	96.9	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.304	4.304	1/-1	4473	17	33:1	Target = 1.09		100.00	86.133		
512 > 219	57	4.315	4.304		6076	18	14:1	0.73 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.452	4.452	1	89034	16	>100:1			1000.00	951.56	98.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.470	4.470	2/1	9052	25	46:1			100.00	106.43		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.479	4.479	2	42128	23	>100:1			1000.00	952.70	97	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.479	4.479	1/-1	4218	11	32:1	Target = 1.02		100.00	88.652		
526 > 219	59	4.479	4.479		5306	21	48:1	0.79 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.575	4.575	5	621860	19				1000.00	1066.14	104.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.575	4.575	5/0	69509	19	84:1	Target = 10.77		100.00	105.62		
613 > 169	38	4.583	4.575		7469	15	63:1	9.30 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.824	4.824	5/0	66209	19	>100:1	Target = 8.06		100.00	112.99		
663 > 169	38	4.832	4.824		6745	18	52:1	9.81 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.062	5.062	6	808961	20	>100:1			1000.00	904.34	89.6	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.062	5.062	6/0	72414	22	20:1	Target = 11.68		100.00	111.34		
713 > 169	42	5.056	5.062		5365	15	81:1	13.49 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.487	5.487	8	887847	20	>100:1			1000.00	1061.95	105	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.487	5.487	8/0	64442	20	16:1	Target = 10.53		100.00	104.56		
813 > 269	40	5.487	5.487		5674	21	68:1	11.35 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.925	5.925	11/3	76971	34	8.5:1	Target = 13.30		100.00	100.34		
913 > 319	40	5.921	5.925		5903	39	64:1	13.03 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.981	3.981	5	818040	16	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.469	2.469	3	561959	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.233	3.233	4	477269	23	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.718	1.718	1	517912	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.608	3.608	4	133565	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621006.d
Injection Date: 16-Aug-2021 13:14:27 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	210.44	105.2	70 - 130
D 46 13C4_PFBA	553436	550664			99.5	50 - 150
D 50 13C5_PFPeA	516955	506462			98	50 - 150
21 PFPeA			200.00	196.47	98.2	70 - 130
7 PFBS			176.80	175.86	99.5	70 - 130
D 44 13C3_PFBS	164534	170451			103.6	50 - 150
1 4:2 FTS			186.80	179.34	96	70 - 130
D 63 13C2_4:2 FTS_2	118214	115382			97.6	50 - 150
D 49 13C5_PFHxA	552268	567063			102.7	50 - 150
15 PFHxA			200.00	204.07	102	70 - 130
22 PFPeS			187.60	174.25	92.9	70 - 130
28 GenX			400.00	391.16	97.8	70 - 130
D 66 13C3_GenX	1119610	1129944			100.9	50 - 150
D 47 13C4_PFHpA	455905	477858			104.8	50 - 150
13 PFHpA			200.00	201.13	100.6	70 - 130
D 45 13C3_PFHxS	127338	128028			100.5	50 - 150
14 PFHxS			182.00	203.07	111.6	70 - 130
29 ADONA			188.40	193.72	102.8	70 - 130
D 64 13C2_6:2 FTS_2	110710	116448			105.2	50 - 150
2 6:2 FTS			189.60	207.56	109.5	70 - 130
D 53 13C8_PFOA	472194	443465			93.9	50 - 150
20 PFOA			200.00	206.55	103.3	70 - 130
12 PFHpS			190.40	211.85	111.3	70 - 130
18 PFOS			185.60	164.26	88.5	70 - 130
D 54 13C8_PFOS	135402	132116			97.6	50 - 150
17 PFNA			200.00	204.81	102.4	70 - 130
D 56 13C9_PFNA	588924	582016			98.8	50 - 150
30 9Cl-PF3ONS			186.40	184.19	98.8	70 - 130
D 55 13C8_PFOSA	246128	237806			96.6	50 - 150
19 PFOSA			200.00	209.82	104.9	70 - 130
16 PFNS			192.00	217.92	113.5	70 - 130
D 65 13C2_8:2 FTS_2	496935	516255			103.9	50 - 150
3 8:2 FTS			191.60	166.39	86.8	70 - 130
10 PFDA			200.00	191.46	95.7	70 - 130
D 51 13C6_PFDA	731005	712664			97.5	50 - 150
6 N-MeFOSAA			200.00	225.39	112.7	70 - 130

Report Date: 17-Aug-2021 18:17:14 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	771140	809500			105	50 - 150
9 PFDS			192.80	194.45	100.9	70 - 130
D 60 d5-EtFOSAA	722676	734814			101.7	50 - 150
D 52 13C7_PFUdA	586419	640311			109.2	50 - 150
5 N-EtFOSAA			200.00	171.79	85.9	70 - 130
25 PFUdA			200.00	187.67	93.8	70 - 130
D 61 d7-MeFOSE	77726	76811			98.8	50 - 150
32 MeFOSE			200.00	216.00	108	70 - 130
D 57 d3-MeFOSA	49045	44249			90.2	50 - 150
26 MeFOSA			200.00	220.18	110.1	70 - 130
31 11Cl-PF3OUDS			188.40	199.80	106	70 - 130
D 62 d9-EtFOSE	89034	93916			105.5	50 - 150
33 EtFOSE			200.00	199.66	99.8	70 - 130
D 59 d5-EtFOSA	42128	41959			99.6	50 - 150
27 EtFOSA			200.00	212.84	106.4	70 - 130
11 PFDoA			200.00	199.33	99.7	70 - 130
D 38 13C2_PFDoA	621860	613546			98.7	50 - 150
4 10:2 FTS			192.80	47.341	24.6	70 - 130
34 PFDOS			193.60	186.30	96.2	70 - 130
24 PFTrDA			200.00	222.08	111	70 - 130
23 PFTeDA			200.00	198.34	99.2	70 - 130
D 42 13C2_PFTeDA	808961	832631			102.9	50 - 150
35 PFHxDA			200.00	194.91	97.5	70 - 130
D 40 13C2_PFHxDA	887847	913041			102.8	50 - 150
36 PFODA			200.00	196.23	98.1	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621006.d
Injection Date: 16-Aug-2021 13:14:27 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1598 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.718	0	550664	21	>100:1			1000.00	991.42	99.5	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.724	1.718	1/1	115818	22	28:1			200.00	210.44		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.098	2.099	0	506462	15	>100:1			1000.00	972.97	98	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.099	0/0	108494	14	98:1			200.00	196.47		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	0	170451	17	>100:1			1000.00	950.13	103.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	0/0	35738	14	>100:1	Target = 3.26		176.80	175.86		
298.9 > 99	44	2.151	2.151		11900	15	39:1	3.00 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.496	0/0	26653	23	>100:1	Target = 3.15		187.60	174.25		
349 > 99	44	2.496	2.496		10431	20	43:1	2.55 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.424	2.425	0	115382	17	>100:1			5000.00	5774.76	97.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.424	2.434	0/0	8913	13	76:1	Target = 1.68		186.80	179.34		M
327 > 81	63	2.433	2.434		4710	10	11:1	1.89 (0.84-2.53)					M
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.469	2.469	0	567063	19	>100:1			1000.00	969.50	102.7	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.469	2.469	0/0	120916	20	84:1	Target = 18.18		200.00	204.07		
313 > 119	49	2.469	2.469		6815	19	62:1	17.74 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.583	2.583	0	1129944	18	>100:1			5000.00	5247.81	100.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.583	2.583	0/0	61728	17	99:1	Target = 0.79		400.00	391.16		
285 > 185	66	2.583	2.583		78119	18	>100:1	0.79 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.845	2.846	0	477858	17	>100:1			1000.00	987.86	104.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.845	2.846	0/0	107364	16	56:1	Target = 3.65		200.00	201.13		
363 > 169	47	2.845	2.846		25170	16	>100:1	4.26 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.854	2.855	0	128028	19	>100:1			1000.00	953.48	100.5	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.863	2.855	1/1	28477	25	>100:1	Target = 3.10	0.14	182.00	203.07		
399 > 99	45	2.854	2.855		9450	26	38:1	3.01 (1.55-4.66)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.888	2.889	0/0	163408	20	>100:1	Target = 3.01		188.40	193.72		
377 > 85	45	2.888	2.889		48651	19	>100:1	3.35 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.234	3.240	0/0	25808	21	>100:1	Target = 2.85		190.40	211.85		
449 > 99	45	3.234	3.240		9066	22	25:1	2.84 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.208	3.207	1	116448	20	>100:1			5000.00	7216.97	105.2	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.208	3.207	1/0	11751	19	>100:1	Target = 1.74		189.60	207.56		
427 > 81	64	3.214	3.207		5254	19	31:1	2.23 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.234	3.233	1	443465	23	>100:1			1000.00	952.04	93.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.241	3.233	1/0	91169	22	52:1	Target = 2.92		200.00	206.55		
413 > 169	53	3.234	3.233		32979	18	>100:1	2.76 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.609	3.608	1	132116	19	>100:1			1000.00	993.11	97.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.609	3.616	0/-1	24597	35	>100:1	Target = 3.34	0.26	185.60	164.26		M
499 > 99	54	3.609	3.616		8864	30	97:1	2.77 (1.67-5.02)	0.05				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.822	3.828	0/-1	92287	19	>100:1			186.40	184.19		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.964	3.962	1/0	23562	17	83:1	Target = 2.63		192.00	217.92		
549 > 99	54	3.954	3.962		8019	12	39:1	2.93 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.278	4.264	1/0	21235	16	>100:1	Target = 2.65		192.80	194.45		
599 > 99	54	4.278	4.264		5563	19	29:1	3.81 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.437	4.443	0/-1	87805	17	>100:1			188.40	199.80		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.800	4.798	1/0	18425	18	>100:1	Target = 3.08		193.60	186.30		
699 > 99	54	4.794	4.798		5823	24	83:1	3.16 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.617	3.616	1	582016	20	>100:1			1000.00	1021.56	98.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.617	3.624	0/-1	131109	21	>100:1	Target = 6.55		200.00	204.81		
463 > 169	56	3.617	3.624		20394	16	58:1	6.42 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.869	1	237806	19	>100:1			1000.00	871.38	96.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.871	3.869	1/0	55900	18	>100:1	Target = 33.36		200.00	209.82		
498>478	55	3.871	3.869		1938	17		28.84 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.974	3.971	1	516255	17	>100:1			5000.00	27020	103.9	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.974	3.971	1/0	38475	15	>100:1	Target = 2.44		191.60	166.39		
527 > 81	65	3.974	3.971		22418	17		1.71 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.586	4.583	1/0	12617	18	72:1	Target = 3.72		192.80	47.341		
627 > 80	65	4.586	4.583		4014	16	38:1	3.14 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.974	3.981	0	712664	16	>100:1			1000.00	1305.63	97.5	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.974	3.971	1/1	158564	16	94:1	Target = 13.09		200.00	191.46		
513 > 169	51	3.974	3.971		12363	15	53:1	12.82 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.134	4.139	0	809500	18	>100:1			5000.00	6471.09	105	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.143	4.139	1/1	29883	34		Target = 1.36	0.20	200.00	225.39		
570 > 483	58	4.143	4.139		22298	35		1.34 (0.68-2.04)	0.30				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.298	4.294	1	640311	15	>100:1			1000.00	1080.62	109.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.298	4.294	1/0	113759	17	>100:1	Target = 14.48		200.00	187.67		
563 > 169	52	4.298	4.294		8441	18	44:1	13.47 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.298	4.294	1	734814	16	>100:1			5000.00	6607.45	101.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.298	4.304	0/-1	26484	32	95:1	Target = 1.63	0.19	200.00	171.79		M
584 > 526	60	4.308	4.304		16440	30	72:1	1.61 (0.81-2.44)	0.21				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.288	4.294	0	76811	14	>100:1			1000.00	921.60	98.8	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.298	4.294	1/1	18692	13	93:1			200.00	216.00		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.308	4.315	0	44249	16	64:1			1000.00	877.86	90.2	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.308	4.304	1/1	10316	16	61:1	Target = 1.09		200.00	220.18		
512 > 219	57	4.318	4.304		10363	18	19:1	0.99 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.455	4.452	1	93916	17	>100:1			1000.00	1003.74	105.5	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.464	4.470	0/-1	17913	16	91:1			200.00	199.66		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.473	4.479	0	41959	22	>100:1			1000.00	948.88	99.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.482	4.479	1/1	10086	14	45:1	Target = 1.02		200.00	212.84		
526 > 219	59	4.482	4.479		9868	15	50:1	1.02 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.578	4.575	1	613546	17	>100:1			1000.00	1051.89	98.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.578	4.575	1/0	129424	18	>100:1	Target = 10.77		200.00	199.33		
613 > 169	38	4.578	4.575		13091	24	63:1	9.88 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.826	4.824	1/0	128399	19	>100:1	Target = 8.06		200.00	222.08		
663 > 169	38	4.834	4.824		14008	20	>100:1	9.16 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.057	5.062	0	832631	22	>100:1			1000.00	930.81	102.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.057	5.062	0/0	132775	20	38:1	Target = 11.68		200.00	198.34		
713 > 169	42	5.057	5.062		11911	21	>100:1	11.14 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.488	5.487	1	913041	22	>100:1			1000.00	1092.08	102.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.488	5.487	1/0	123532	20	32:1	Target = 10.53		200.00	194.91		
813 > 269	40	5.488	5.487		11508	23	>100:1	10.73 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.927	5.925	1/0	154797	34	18:1	Target = 13.30		200.00	196.23		
913 > 319	40	5.919	5.925		11994	42	>100:1	12.90 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.974	3.981	0	891622	16	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.469	2.469	0	554500	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.234	3.233	1	457126	20	>100:1						

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621019.d
Injection Date: 16-Aug-2021 15:22:35 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 11
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	998.77	99.9	70 - 130
D 46 13C4_PFBA	553436	554168			100.1	50 - 150
D 50 13C5_PFPeA	516955	484323			93.7	50 - 150
21 PFPeA			1000.00	1043.04	104.3	70 - 130
7 PFBS			884.00	881.23	99.7	70 - 130
D 44 13C3_PFBS	164534	171412			104.2	50 - 150
1 4:2 FTS			934.00	867.66	92.9	70 - 130
D 63 13C2_4:2 FTS_2	118214	118728			100.4	50 - 150
D 49 13C5_PFHxA	552268	565251			102.4	50 - 150
15 PFHxA			1000.00	1000.91	100.1	70 - 130
22 PFPeS			938.00	911.64	97.2	70 - 130
28 GenX			2000.00	1924.09	96.2	70 - 130
D 66 13C3_GenX	1119610	1070620			95.6	50 - 150
D 47 13C4_PFHpA	455905	476723			104.6	50 - 150
13 PFHpA			1000.00	1037.96	103.8	70 - 130
D 45 13C3_PFHxS	127338	133850			105.1	50 - 150
14 PFHxS			910.00	862.42	94.8	70 - 130
29 ADONA			942.00	944.67	100.3	70 - 130
D 64 13C2_6:2 FTS_2	110710	104678			94.6	50 - 150
2 6:2 FTS			948.00	1016.53	107.2	70 - 130
D 53 13C8_PFOA	472194	436740			92.5	50 - 150
20 PFOA			1000.00	997.25	99.7	70 - 130
12 PFHpS			952.00	1009.59	106	70 - 130
18 PFOS			928.00	971.47	104.7	70 - 130
D 54 13C8_PFOS	135402	126996			93.8	50 - 150
17 PFNA			1000.00	1033.62	103.4	70 - 130
D 56 13C9_PFNA	588924	564797			95.9	50 - 150
30 9Cl-PF3ONS			932.00	989.80	106.2	70 - 130
D 55 13C8_PFOSA	246128	266440			108.3	50 - 150
19 PFOSA			1000.00	944.28	94.4	70 - 130
16 PFNS			960.00	1098.35	114.4	70 - 130
D 65 13C2_8:2 FTS_2	496935	478482			96.3	50 - 150
3 8:2 FTS			958.00	898.47	93.8	70 - 130
10 PFDA			1000.00	923.62	92.4	70 - 130
D 51 13C6_PFDA	731005	721459			98.7	50 - 150
6 N-MeFOSAA			1000.00	1047.13	104.7	70 - 130

Report Date: 17-Aug-2021 18:17:19 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621019.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	771140	821223			106.5	50 - 150
9 PFDS			964.00	1013.06	105.1	70 - 130
D 60 d5-EtFOSAA	722676	728754			100.8	50 - 150
D 52 13C7_PFUdA	586419	589348			100.5	50 - 150
5 N-EtFOSAA			1000.00	886.33	88.6	70 - 130
25 PFUdA			1000.00	1018.78	101.9	70 - 130
D 61 d7-MeFOSE	77726	78990			101.6	50 - 150
32 MeFOSE			1000.00	948.97	94.9	70 - 130
D 57 d3-MeFOSA	49045	47427			96.7	50 - 150
26 MeFOSA			1000.00	1043.44	104.3	70 - 130
31 11Cl-PF3OUDS			942.00	974.64	103.5	70 - 130
D 62 d9-EtFOSE	89034	87521			98.3	50 - 150
33 EtFOSE			1000.00	1102.79	110.3	70 - 130
D 59 d5-EtFOSA	42128	42819			101.6	50 - 150
27 EtFOSA			1000.00	1038.12	103.8	70 - 130
11 PFDoA			1000.00	1092.28	109.2	70 - 130
D 38 13C2_PFDoA	621860	594442			95.6	50 - 150
4 10:2 FTS			964.00	271.91	28.2	70 - 130
34 PFDOS			968.00	1014.32	104.8	70 - 130
24 PFTrDA			1000.00	1129.41	112.9	70 - 130
23 PFTeDA			1000.00	1029.97	103	70 - 130
D 42 13C2_PFTeDA	808961	828338			102.4	50 - 150
35 PFHxDA			1000.00	968.53	96.9	70 - 130
D 40 13C2_PFHxDA	887847	913111			102.8	50 - 150
36 PFODA			1000.00	994.63	99.5	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621019.d
Injection Date: 16-Aug-2021 15:22:35 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 11
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.722	1.718	2	554168	21	>100:1			1000.00	997.73	100.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.722	1.718	2/0	553169	22	>100:1			1000.00	998.77		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.093	2.099	2	484323	17	>100:1			1000.00	930.43	93.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.093	2.099	2/0	550807	17	>100:1			1000.00	1043.04		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.157	2.151	2	171412	15	>100:1			1000.00	955.49	104.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.157	2.151	2/0	180096	15	>100:1	Target = 3.26		884.00	881.23		
298.9 > 99	44	2.157	2.151		53704	16	>100:1	3.35 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.495	2.496	3/1	140225	18	>100:1	Target = 3.15		938.00	911.64		
349 > 99	44	2.495	2.496		48331	18	>100:1	2.90 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.423	2.425	3	118728	18	>100:1			5000.00	5942.22	100.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.432	2.434	3/0	44372	16		Target = 1.68		934.00	867.66		
327 > 81	63	2.423	2.434		25524	23	47:1	1.73 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.468	2.469	3	565251	19	>100:1			1000.00	966.41	102.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.468	2.469	3/0	591178	17	>100:1	Target = 18.18		1000.00	1000.91		
313 > 119	49	2.468	2.469		32504	15	>100:1	18.18 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.582	2.583	2	1070620	18	>100:1			5000.00	4972.29	95.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.582	2.583	2/0	287694	20	>100:1	Target = 0.79		2000.00	1924.09		
285 > 185	66	2.582	2.583		368901	19	>100:1	0.77 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.844	2.846	3	476723	19	>100:1			1000.00	985.51	104.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.844	2.846	3/0	552748	18	>100:1	Target = 3.65		1000.00	1037.96		
363 > 169	47	2.844	2.846		137349	18	>100:1	4.02 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.862	2.855	3	133850	18	>100:1			1000.00	996.83	105.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.862	2.855	3/0	126441	26	>100:1	Target = 3.10	0.15	910.00	862.42		
399 > 99	45	2.862	2.855		41067	29	>100:1	3.07 (1.55-4.66)	0.15				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.879	2.889	3/0	833074	19	>100:1	Target = 3.01		942.00	944.67		
377 > 85	45	2.887	2.889		256770	19	>100:1	3.24 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.238	3.240	4/1	128583	22	>100:1	Target = 2.85		952.00	1009.59		
449 > 99	45	3.238	3.240		41682	20	>100:1	3.08 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.205	3.207	4	104678	22	>100:1			5000.00	6487.51	94.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.205	3.207	3/-1	51735	21	>100:1	Target = 1.74		948.00	1016.53		
427 > 81	64	3.211	3.207		25889	25	>100:1	1.99 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.231	3.233	4	436740	21	>100:1			1000.00	937.60	92.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.231	3.233	4/0	433501	21	>100:1	Target = 2.92		1000.00	997.25		
413 > 169	53	3.231	3.233		155161	22	>100:1	2.79 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.613	3.608	4	126996	17	>100:1			1000.00	954.63	93.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.613	3.616	0/-4	139838	36	99:1	Target = 3.34	0.27	928.00	971.47		
499 > 99	54	3.613	3.616		44141	29	>100:1	3.16 (1.67-5.02)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.826	3.828	4/0	476724	19	>100:1			932.00	989.80		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.968	3.962	5/1	114152	19	>100:1	Target = 2.63		960.00	1098.35		
549 > 99	54	3.958	3.962		43033	16	>100:1	2.65 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.270	4.264	4/0	106342	15	>100:1	Target = 2.65		964.00	1013.06		
599 > 99	54	4.280	4.264		39013	15	>100:1	2.72 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.440	4.443	5/1	411729	18	>100:1			942.00	974.64		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.797	4.798	5/1	96429	19	>100:1	Target = 3.08		968.00	1014.32		
699 > 99	54	4.797	4.798		32750	20	>100:1	2.94 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.621	3.616	4	564797	20	>100:1			1000.00	991.34	95.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.621	3.624	4/0	642092	21	>100:1	Target = 6.55		1000.00	1033.62		
463 > 169	56	3.621	3.624		100626	20	>100:1	6.38 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.867	3.869	2	266440	18	>100:1			1000.00	976.30	108.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.875	3.869	2/0	281859	20	>100:1	Target = 33.36		1000.00	944.28		
498>478	55	3.867	3.869		10930	16		25.78 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.968	3.971	5	478482	18	>100:1			5000.00	25043	96.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.968	3.971	4/-1	192561	18	>100:1	Target = 2.44		958.00	898.47		
527 > 81	65	3.968	3.971		106408	17	>100:1	1.80 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.589	4.583	5/0	67166	16		Target = 3.72		964.00	271.91		
627 > 80	65	4.589	4.583		21699	16	>100:1	3.09 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.978	3.981	5	721459	17	>100:1			1000.00	1321.74	98.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.978	3.971	5/0	774374	16	>100:1	Target = 13.09		1000.00	923.62		
513 > 169	51	3.978	3.971		60739	15	>100:1	12.74 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.136	4.139	5	821223	18	>100:1			5000.00	6564.80	106.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.145	4.139	1/-4	140840	33	>100:1	Target = 1.36	0.15	1000.00	1047.13		M
570 > 483	58	4.136	4.139		104840	32	>100:1	1.34 (0.68-2.04)	0.37				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.300	4.294	5	589348	16	>100:1			1000.00	994.62	100.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.290	4.294	5/0	568385	16	>100:1	Target = 14.48		1000.00	1018.78		
563 > 169	52	4.290	4.294		40863	15	>100:1	13.90 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.300	4.294	5	728754	15	>100:1			5000.00	6552.96	100.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.300	4.304	0/-5	135518	32	>100:1	Target = 1.63		1000.00	886.33		M
584 > 526	60	4.300	4.304		92206	35	>100:1	1.46 (0.81-2.44)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.290	4.294	1	78990	14	>100:1			1000.00	947.75	101.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.300	4.294	1/0	84451	15	>100:1			1000.00	948.97		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.310	4.315	2	47427	14	>100:1			1000.00	940.91	96.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.310	4.304	1/-1	52400	18	>100:1	Target = 1.09		1000.00	1043.44		
512 > 219	57	4.310	4.304		51295	14	>100:1	1.02 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.449	4.452	1	87521	16	>100:1			1000.00	935.39	98.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.467	4.470	1/0	92201	16	>100:1			1000.00	1102.79		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.476	4.479	1	42819	14	>100:1			1000.00	968.33	101.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.485	4.479	1/0	50203	16	>100:1	Target = 1.02		1000.00	1038.12		
526 > 219	59	4.485	4.479		48163	16	>100:1	1.04 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.573	4.575	5	594442	17				1000.00	1019.14	95.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.581	4.575	5/0	687122	16	>100:1	Target = 10.77		1000.00	1092.28		
613 > 169	38	4.573	4.575		61326	19	>100:1	11.20 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.831	4.824	6/1	632650	19	>100:1	Target = 8.06		1000.00	1129.41		
663 > 169	38	4.831	4.824		71258	17	>100:1	8.87 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.055	5.062	6	828338	22	>100:1			1000.00	926.01	102.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.061	5.062	6/0	685937	22	>100:1	Target = 11.68		1000.00	1029.97		
713 > 169	42	5.055	5.062		59803	22	>100:1	11.46 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.485	5.487	8	913111	21	>100:1			1000.00	1092.16	102.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.485	5.487	8/0	613884	22	>100:1	Target = 10.53		1000.00	968.53		
813 > 269	40	5.485	5.487		58458	22	>100:1	10.50 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.924	5.925	11/3	784672	43	93:1	Target = 13.30		1000.00	994.63		
913 > 319	40	5.919	5.925		61597	46	>100:1	12.73 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.978	3.981	5	858182	16	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.468	2.469	3	601504	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.231	3.233	4	455227	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.722	1.718	2	520637	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.613	3.608	4	140486	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.718	1.718	0	505377	22	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.609	3.608	1	134394	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621019.d
Injection Date: 16-Aug-2021 15:22:35 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 11
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	998.77	99.9	70 - 130
D 46 13C4_PFBA	553436	554168			100.1	50 - 150
D 50 13C5_PFPeA	516955	484323			93.7	50 - 150
21 PFPeA			1000.00	1043.04	104.3	70 - 130
7 PFBS			884.00	881.23	99.7	70 - 130
D 44 13C3_PFBS	164534	171412			104.2	50 - 150
1 4:2 FTS			934.00	867.66	92.9	70 - 130
D 63 13C2_4:2 FTS_2	118214	118728			100.4	50 - 150
D 49 13C5_PFHxA	552268	565251			102.4	50 - 150
15 PFHxA			1000.00	1000.91	100.1	70 - 130
22 PFPeS			938.00	911.64	97.2	70 - 130
28 GenX			2000.00	1924.09	96.2	70 - 130
D 66 13C3_GenX	1119610	1070620			95.6	50 - 150
D 47 13C4_PFHpA	455905	476723			104.6	50 - 150
13 PFHpA			1000.00	1037.96	103.8	70 - 130
D 45 13C3_PFHxS	127338	133850			105.1	50 - 150
14 PFHxS			910.00	862.42	94.8	70 - 130
29 ADONA			942.00	944.67	100.3	70 - 130
D 64 13C2_6:2 FTS_2	110710	104678			94.6	50 - 150
2 6:2 FTS			948.00	1016.53	107.2	70 - 130
D 53 13C8_PFOA	472194	436740			92.5	50 - 150
20 PFOA			1000.00	997.25	99.7	70 - 130
12 PFHpS			952.00	1009.59	106	70 - 130
18 PFOS			928.00	971.47	104.7	70 - 130
D 54 13C8_PFOS	135402	126996			93.8	50 - 150
17 PFNA			1000.00	1033.62	103.4	70 - 130
D 56 13C9_PFNA	588924	564797			95.9	50 - 150
30 9Cl-PF3ONS			932.00	989.80	106.2	70 - 130
D 55 13C8_PFOSA	246128	266440			108.3	50 - 150
19 PFOSA			1000.00	944.28	94.4	70 - 130
16 PFNS			960.00	1098.35	114.4	70 - 130
D 65 13C2_8:2 FTS_2	496935	478482			96.3	50 - 150
3 8:2 FTS			958.00	898.47	93.8	70 - 130
10 PFDA			1000.00	923.62	92.4	70 - 130
D 51 13C6_PFDA	731005	721459			98.7	50 - 150
6 N-MeFOSAA			1000.00	1047.13	104.7	70 - 130

Report Date: 17-Aug-2021 18:17:19 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621019.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	771140	821223			106.5	50 - 150
9 PFDS			964.00	1013.06	105.1	70 - 130
D 60 d5-EtFOSAA	722676	728754			100.8	50 - 150
D 52 13C7_PFUdA	586419	589348			100.5	50 - 150
5 N-EtFOSAA			1000.00	886.33	88.6	70 - 130
25 PFUdA			1000.00	1018.78	101.9	70 - 130
D 61 d7-MeFOSE	77726	78990			101.6	50 - 150
32 MeFOSE			1000.00	948.97	94.9	70 - 130
D 57 d3-MeFOSA	49045	47427			96.7	50 - 150
26 MeFOSA			1000.00	1043.44	104.3	70 - 130
31 11Cl-PF3OUDS			942.00	974.64	103.5	70 - 130
D 62 d9-EtFOSE	89034	87521			98.3	50 - 150
33 EtFOSE			1000.00	1102.79	110.3	70 - 130
D 59 d5-EtFOSA	42128	42819			101.6	50 - 150
27 EtFOSA			1000.00	1038.12	103.8	70 - 130
11 PFDoA			1000.00	1092.28	109.2	70 - 130
D 38 13C2_PFDoA	621860	594442			95.6	50 - 150
4 10:2 FTS			964.00	271.91	28.2	70 - 130
34 PFDOS			968.00	1014.32	104.8	70 - 130
24 PFTrDA			1000.00	1129.41	112.9	70 - 130
23 PFTeDA			1000.00	1029.97	103	70 - 130
D 42 13C2_PFTeDA	808961	828338			102.4	50 - 150
35 PFHxDA			1000.00	968.53	96.9	70 - 130
D 40 13C2_PFHxDA	887847	913111			102.8	50 - 150
36 PFODA			1000.00	994.63	99.5	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621019.d
Injection Date: 16-Aug-2021 15:22:35 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 11
Sample Info: ID CCV 1000_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.722	1.718	2	554168	21	>100:1			1000.00	997.73	100.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.722	1.718	2/0	553169	22	>100:1			1000.00	998.77		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.093	2.099	2	484323	17	>100:1			1000.00	930.43	93.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.093	2.099	2/0	550807	17	>100:1			1000.00	1043.04		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.157	2.151	2	171412	15	>100:1			1000.00	955.49	104.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.157	2.151	2/0	180096	15	>100:1	Target = 3.26		884.00	881.23		
298.9 > 99	44	2.157	2.151		53704	16	>100:1	3.35 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.495	2.496	3/1	140225	18	>100:1	Target = 3.15		938.00	911.64		
349 > 99	44	2.495	2.496		48331	18	>100:1	2.90 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.423	2.425	3	118728	18	>100:1			5000.00	5942.22	100.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.432	2.434	3/0	44372	16		Target = 1.68		934.00	867.66		
327 > 81	63	2.423	2.434		25524	23	47:1	1.73 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.468	2.469	3	565251	19	>100:1			1000.00	966.41	102.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.468	2.469	3/0	591178	17	>100:1	Target = 18.18		1000.00	1000.91		
313 > 119	49	2.468	2.469		32504	15	>100:1	18.18 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.582	2.583	2	1070620	18	>100:1			5000.00	4972.29	95.6	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.582	2.583	2/0	287694	20	>100:1	Target = 0.79		2000.00	1924.09		
285 > 185	66	2.582	2.583		368901	19	>100:1	0.77 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.844	2.846	3	476723	19	>100:1			1000.00	985.51	104.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.844	2.846	3/0	552748	18	>100:1	Target = 3.65		1000.00	1037.96		
363 > 169	47	2.844	2.846		137349	18	>100:1	4.02 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.862	2.855	3	133850	18	>100:1			1000.00	996.83	105.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.862	2.855	3/0	126441	26	>100:1	Target = 3.10	0.15	910.00	862.42		
399 > 99	45	2.862	2.855		41067	29	>100:1	3.07 (1.55-4.66)	0.15				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.879	2.889	3/0	833074	19	>100:1	Target = 3.01		942.00	944.67		
377 > 85	45	2.887	2.889		256770	19	>100:1	3.24 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.238	3.240	4/1	128583	22	>100:1	Target = 2.85		952.00	1009.59		
449 > 99	45	3.238	3.240		41682	20	>100:1	3.08 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.205	3.207	4	104678	22	>100:1			5000.00	6487.51	94.6	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.205	3.207	3/-1	51735	21	>100:1	Target = 1.74		948.00	1016.53		
427 > 81	64	3.211	3.207		25889	25	>100:1	1.99 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.231	3.233	4	436740	21	>100:1			1000.00	937.60	92.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.231	3.233	4/0	433501	21	>100:1	Target = 2.92		1000.00	997.25		
413 > 169	53	3.231	3.233		155161	22	>100:1	2.79 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.613	3.608	4	126996	17	>100:1			1000.00	954.63	93.8	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.613	3.616	0/-4	139838	36	99:1	Target = 3.34	0.27	928.00	971.47		
499 > 99	54	3.613	3.616		44141	29	>100:1	3.16 (1.67-5.02)					M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.826	3.828	4/0	476724	19	>100:1			932.00	989.80		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.968	3.962	5/1	114152	19	>100:1	Target = 2.63		960.00	1098.35		
549 > 99	54	3.958	3.962		43033	16	>100:1	2.65 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.270	4.264	4/0	106342	15	>100:1	Target = 2.65		964.00	1013.06		
599 > 99	54	4.280	4.264		39013	15	>100:1	2.72 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.440	4.443	5/1	411729	18	>100:1			942.00	974.64		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.797	4.798	5/1	96429	19	>100:1	Target = 3.08		968.00	1014.32		
699 > 99	54	4.797	4.798		32750	20	>100:1	2.94 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.621	3.616	4	564797	20	>100:1			1000.00	991.34	95.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.621	3.624	4/0	642092	21	>100:1	Target = 6.55		1000.00	1033.62		
463 > 169	56	3.621	3.624		100626	20	>100:1	6.38 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.867	3.869	2	266440	18	>100:1			1000.00	976.30	108.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.875	3.869	2/0	281859	20	>100:1	Target = 33.36		1000.00	944.28		
498>478	55	3.867	3.869		10930	16		25.78 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.968	3.971	5	478482	18	>100:1			5000.00	25043	96.3	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.968	3.971	4/-1	192561	18	>100:1	Target = 2.44		958.00	898.47		
527 > 81	65	3.968	3.971		106408	17	>100:1	1.80 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.589	4.583	5/0	67166	16		Target = 3.72		964.00	271.91		
627 > 80	65	4.589	4.583		21699	16	>100:1	3.09 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.978	3.981	5	721459	17	>100:1			1000.00	1321.74	98.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.978	3.971	5/0	774374	16	>100:1	Target = 13.09		1000.00	923.62		
513 > 169	51	3.978	3.971		60739	15	>100:1	12.74 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.136	4.139	5	821223	18	>100:1			5000.00	6564.80	106.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.145	4.139	1/-4	140840	33	>100:1	Target = 1.36	0.15	1000.00	1047.13		M
570 > 483	58	4.136	4.139		104840	32	>100:1	1.34 (0.68-2.04)	0.37				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.300	4.294	5	589348	16	>100:1			1000.00	994.62	100.5	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.290	4.294	5/0	568385	16	>100:1	Target = 14.48		1000.00	1018.78		
563 > 169	52	4.290	4.294		40863	15	>100:1	13.90 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.300	4.294	5	728754	15	>100:1			5000.00	6552.96	100.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.300	4.304	0/-5	135518	32	>100:1	Target = 1.63		1000.00	886.33		M
584 > 526	60	4.300	4.304		92206	35	>100:1	1.46 (0.81-2.44)					M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.290	4.294	1	78990	14	>100:1			1000.00	947.75	101.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.300	4.294	1/0	84451	15	>100:1			1000.00	948.97		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.310	4.315	2	47427	14	>100:1			1000.00	940.91	96.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.310	4.304	1/-1	52400	18	>100:1	Target = 1.09		1000.00	1043.44		
512 > 219	57	4.310	4.304		51295	14	>100:1	1.02 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.449	4.452	1	87521	16	>100:1			1000.00	935.39	98.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.467	4.470	1/0	92201	16	>100:1			1000.00	1102.79		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.476	4.479	1	42819	14	>100:1			1000.00	968.33	101.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.485	4.479	1/0	50203	16	>100:1	Target = 1.02		1000.00	1038.12		
526 > 219	59	4.485	4.479		48163	16	>100:1	1.04 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.573	4.575	5	594442	17				1000.00	1019.14	95.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.581	4.575	5/0	687122	16	>100:1	Target = 10.77		1000.00	1092.28		
613 > 169	38	4.573	4.575		61326	19	>100:1	11.20 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.831	4.824	6/1	632650	19	>100:1	Target = 8.06		1000.00	1129.41		
663 > 169	38	4.831	4.824		71258	17	>100:1	8.87 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.055	5.062	6	828338	22	>100:1			1000.00	926.01	102.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.061	5.062	6/0	685937	22	>100:1	Target = 11.68		1000.00	1029.97		
713 > 169	42	5.055	5.062		59803	22	>100:1	11.46 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.485	5.487	8	913111	21	>100:1			1000.00	1092.16	102.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.485	5.487	8/0	613884	22	>100:1	Target = 10.53		1000.00	968.53		
813 > 269	40	5.485	5.487		58458	22	>100:1	10.50 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.924	5.925	11/3	784672	43	93:1	Target = 13.30		1000.00	994.63		
913 > 319	40	5.919	5.925		61597	46	>100:1	12.73 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.978	3.981	5	858182	16	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.468	2.469	3	601504	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.231	3.233	4	455227	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.722	1.718	2	520637	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.613	3.608	4	140486	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621031.d
Injection Date: 16-Aug-2021 17:30:02 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 23
Sample Info: ID CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1048.49	104.8	70 - 130
D 46 13C4_PFBA	553436	550339			99.4	50 - 150
D 50 13C5_PFPeA	516955	515462			99.7	50 - 150
21 PFPeA			1000.00	991.16	99.1	70 - 130
7 PFBS			884.00	955.59	108.1	70 - 130
D 44 13C3_PFBS	164534	167800			102	50 - 150
1 4:2 FTS			934.00	818.42	87.6	70 - 130
D 63 13C2_4:2 FTS_2	118214	121790			103	50 - 150
D 49 13C5_PFHxA	552268	551456			99.9	50 - 150
15 PFHxA			1000.00	1003.73	100.4	70 - 130
22 PFPeS			938.00	916.89	97.7	70 - 130
28 GenX			2000.00	1751.04	87.6	70 - 130
D 66 13C3_GenX	1119610	1101857			98.4	50 - 150
D 47 13C4_PFHpA	455905	498587			109.4	50 - 150
13 PFHpA			1000.00	956.96	95.7	70 - 130
D 45 13C3_PFHxS	127338	133892			105.1	50 - 150
14 PFHxS			910.00	953.64	104.8	70 - 130
29 ADONA			942.00	943.75	100.2	70 - 130
D 64 13C2_6:2 FTS_2	110710	125948			113.8	50 - 150
2 6:2 FTS			948.00	954.11	100.6	70 - 130
D 53 13C8_PFOA	472194	418096			88.5	50 - 150
20 PFOA			1000.00	1100.80	110.1	70 - 130
12 PFHpS			952.00	1024.06	107.6	70 - 130
18 PFOS			928.00	903.44	97.4	70 - 130
D 54 13C8_PFOS	135402	137172			101.3	50 - 150
17 PFNA			1000.00	1003.80	100.4	70 - 130
D 56 13C9_PFNA	588924	580170			98.5	50 - 150
30 9Cl-PF3ONS			932.00	936.94	100.5	70 - 130
D 55 13C8_PFOSA	246128	265050			107.7	50 - 150
19 PFOSA			1000.00	968.15	96.8	70 - 130
16 PFNS			960.00	957.30	99.7	70 - 130
D 65 13C2_8:2 FTS_2	496935	497776			100.2	50 - 150
3 8:2 FTS			958.00	951.44	99.3	70 - 130
10 PFDA			1000.00	994.06	99.4	70 - 130
D 51 13C6_PFDA	731005	689043			94.3	50 - 150
6 N-MeFOSAA			1000.00	1005.30	100.5	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	771140	856115			111	50 - 150
9 PFDS			964.00	863.16	89.5	70 - 130
D 60 d5-EtFOSAA	722676	709515			98.2	50 - 150
D 52 13C7_PFUdA	586419	642479			109.6	50 - 150
5 N-EtFOSAA			1000.00	996.09	99.6	70 - 130
25 PFUdA			1000.00	938.65	93.9	70 - 130
D 61 d7-MeFOSE	77726	81567			104.9	50 - 150
32 MeFOSE			1000.00	999.30	99.9	70 - 130
D 57 d3-MeFOSA	49045	49902			101.7	50 - 150
26 MeFOSA			1000.00	959.42	95.9	70 - 130
31 11Cl-PF3OUDS			942.00	887.44	94.2	70 - 130
D 62 d9-EtFOSE	89034	85692			96.2	50 - 150
33 EtFOSE			1000.00	1077.02	107.7	70 - 130
D 59 d5-EtFOSA	42128	50117			119	50 - 150
27 EtFOSA			1000.00	833.91	83.4	70 - 130
11 PFDoA			1000.00	1012.21	101.2	70 - 130
D 38 13C2_PFDoA	621860	600616			96.6	50 - 150
4 10:2 FTS			964.00	248.94	25.8	70 - 130
34 PFDOS			968.00	965.79	99.8	70 - 130
24 PFTrDA			1000.00	1126.49	112.6	70 - 130
23 PFTeDA			1000.00	1024.30	102.4	70 - 130
D 42 13C2_PFTeDA	808961	830712			102.7	50 - 150
35 PFHxDA			1000.00	968.42	96.8	70 - 130
D 40 13C2_PFHxDA	887847	896161			100.9	50 - 150
36 PFODA			1000.00	1005.92	100.6	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621031.d
Injection Date: 16-Aug-2021 17:30:02 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 23
Sample Info: ID CCV 1000A_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.715	1.718	0	550339	21	>100:1			1000.00	990.84	99.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.722	1.718	1/1	576694	22	>100:1			1000.00	1048.49		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.094	2.099	1	515462	17	>100:1			1000.00	990.26	99.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.094	2.099	1/0	557060	16	>100:1			1000.00	991.16		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.146	2.151	0	167800	15	>100:1			1000.00	935.35	102	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.146	2.151	0/0	191178	14	>100:1	Target = 3.26		884.00	955.59		
298.9 > 99	44	2.157	2.151		55788	15	>100:1	3.42 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.495	2.496	1/1	138061	17	>100:1	Target = 3.15		938.00	916.89		
349 > 99	44	2.495	2.496		45035	18	>100:1	3.06 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.423	2.425	1	121790	17	>100:1			5000.00	6095.47	103	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.423	2.434	0/-1	42933	16	>100:1	Target = 1.68		934.00	818.42		
327 > 81	63	2.432	2.434		21805	13	53:1	1.96 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.468	2.469	1	551456	18	>100:1			1000.00	942.82	99.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.468	2.469	1/0	578370	17	>100:1	Target = 18.18		1000.00	1003.73		
313 > 119	49	2.468	2.469		32320	17	>100:1	17.89 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.582	2.583	1	1101857	20	>100:1			5000.00	5117.36	98.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.582	2.583	1/0	269459	18	>100:1	Target = 0.79		2000.00	1751.04		
285 > 185	66	2.582	2.583		374941	18	>100:1	0.71 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.844	2.846	1	498587	17	>100:1			1000.00	1030.71	109.4	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.844	2.846	1/0	532987	16	>100:1	Target = 3.65		1000.00	956.96		
363 > 169	47	2.844	2.846		147508	19	>100:1	3.61 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.853	2.855	0	133892	19	>100:1			1000.00	997.15	105.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.853	2.855	0/0	139859	26	>100:1	Target = 3.10	0.16	910.00	953.64		
399 > 99	45	2.853	2.855		47108	24	>100:1	2.96 (1.55-4.66)	0.09				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.879	2.889	1/1	832532	18	>100:1	Target = 3.01		942.00	943.75		
377 > 85	45	2.879	2.889		265659	18	>100:1	3.13 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.232	3.240	0/0	130466	23	>100:1	Target = 2.85		952.00	1024.06		
449 > 99	45	3.232	3.240		38691	20	61:1	3.37 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.198	3.207	0	125948	21	>100:1			5000.00	7805.74	113.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.205	3.207	1/1	58425	19		Target = 1.74		948.00	954.11		
427 > 81	64	3.205	3.207		31296	20	>100:1	1.86 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.225	3.233	0	418096	21	>100:1			1000.00	897.58	88.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.232	3.233	1/1	458088	19	>100:1	Target = 2.92		1000.00	1100.80		
413 > 169	53	3.232	3.233		160798	20	>100:1	2.84 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.606	3.608	0	137172	18	>100:1			1000.00	1031.12	101.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.606	3.616	0/0	140467	36	>100:1	Target = 3.34	0.30	928.00	903.44		
499 > 99	54	3.606	3.616		37211	26	76:1	3.77 (1.67-5.02)	0.09				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.819	3.828	0/0	487424	18	>100:1			932.00	936.94		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.960	3.962	0/0	107465	16	>100:1	Target = 2.63		960.00	957.30		
549 > 99	54	3.960	3.962		45669	23	>100:1	2.35 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.272	4.264	1/1	97867	15	>100:1	Target = 2.65		964.00	863.16		
599 > 99	54	4.272	4.264		38100	15	>100:1	2.56 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.432	4.443	0/0	404930	17	>100:1			942.00	887.44		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.797	4.798	1/1	99172	21	>100:1	Target = 3.08		968.00	965.79		
699 > 99	54	4.791	4.798		30150	19	>100:1	3.28 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.614	3.616	0	580170	19	>100:1			1000.00	1018.32	98.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.614	3.624	0/0	640539	19	>100:1	Target = 6.55		1000.00	1003.80		
463 > 169	56	3.614	3.624		96411	20	>100:1	6.64 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.860	3.869	0	265050	18	>100:1			1000.00	971.20	107.7	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.860	3.869	0/0	287478	18	>100:1	Target = 33.36		1000.00	968.15		
498>478	55	3.860	3.869		9813	21		29.29 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.960	3.971	0	497776	17	>100:1			5000.00	26053	100.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.960	3.971	0/0	212136	17	>100:1	Target = 2.44		958.00	951.44		
527 > 81	65	3.960	3.971		112490	16	>100:1	1.88 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.582	4.583	0/0	63971	20		Target = 3.72		964.00	248.94		
627 > 80	65	4.582	4.583		20085	22	>100:1	3.18 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.969	3.981	0	689043	16	>100:1			1000.00	1262.35	94.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.969	3.971	0/0	795981	17	>100:1	Target = 13.09		1000.00	994.06		
513 > 169	51	3.969	3.971		58015	21	>100:1	13.72 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.129	4.139	0	856115	17	>100:1			5000.00	6843.73	111	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.137	4.139	0/0	140959	34	>100:1	Target = 1.36	0.15	1000.00	1005.30		M
570 > 483	58	4.137	4.139		106778	32		1.32 (0.68-2.04)	0.24				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.292	4.294	0	642479	15	>100:1			1000.00	1084.28	109.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.292	4.294	1/1	570895	17	>100:1	Target = 14.48		1000.00	938.65		
563 > 169	52	4.292	4.294		45103	14	>100:1	12.65 (7.24-21.72)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.292	4.294	0	709515	16	>100:1			5000.00	6379.97	98.2	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.302	4.304	0/0	148280	34		Target = 1.63		1000.00	996.09		M
584 > 526	60	4.302	4.304		94982	30	>100:1	1.56 (0.81-2.44)	0.22				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.282	4.294	0	81567	16	>100:1			1000.00	978.67	104.9	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.292	4.294	0/0	91831	15	>100:1			1000.00	999.30		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.302	4.315	0	49902	14	>100:1			1000.00	990.01	101.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.302	4.304	0/0	50695	15	>100:1	Target = 1.09		1000.00	959.42		
512 > 219	57	4.312	4.304		46714	22	>100:1	1.08 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.450	4.452	1	85692	17	>100:1			1000.00	915.85	96.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.459	4.470	0/-1	88165	16	>100:1			1000.00	1077.02		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.468	4.479	0	50117	17	>100:1			1000.00	1133.37	119	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.477	4.479	0/0	47201	15	>100:1	Target = 1.02		1000.00	833.91		
526 > 219	59	4.477	4.479		50745	20	>100:1	0.93 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.574	4.575	1	600616	17	>100:1			1000.00	1029.72	96.6	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.574	4.575	0/-1	643368	17	>100:1	Target = 10.77		1000.00	1012.21		
613 > 169	38	4.574	4.575		57885	18	>100:1	11.11 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.823	4.824	0/-1	637566	20	>100:1	Target = 8.06		1000.00	1126.49		
663 > 169	38	4.823	4.824		77886	20	>100:1	8.18 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.055	5.062	1	830712	22	>100:1			1000.00	928.66	102.7	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.055	5.062	0/-1	684113	22	>100:1	Target = 11.68		1000.00	1024.30		
713 > 169	42	5.055	5.062		58364	21	>100:1	11.72 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.485	5.487	1	896161	22	>100:1			1000.00	1071.89	100.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.485	5.487	1/0	602423	23	>100:1	Target = 10.53		1000.00	968.42		
813 > 269	40	5.485	5.487		60014	22	>100:1	10.03 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.920	5.925	0/-1	778847	43	91:1	Target = 13.30		1000.00	1005.92		
913 > 319	40	5.916	5.925		59795	44	>100:1	13.02 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.969	3.981	0	828841	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.459	2.469	0	582203	18	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.232	3.233	1	457412	20	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.715	1.718	0	522855	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.606	3.608	0	138674	17	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621045.d
Injection Date: 16-Aug-2021 19:59:02 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 37
Sample Info: ID CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1012.89	101.3	70 - 130
D 46 13C4_PFBA	553436	542026			97.9	50 - 150
D 50 13C5_PFPeA	516955	504732			97.6	50 - 150
21 PFPeA			1000.00	998.72	99.9	70 - 130
7 PFBS			884.00	906.10	102.5	70 - 130
D 44 13C3_PFBS	164534	170174			103.4	50 - 150
1 4:2 FTS			934.00	1017.11	108.9	70 - 130
D 63 13C2_4:2 FTS_2	118214	112137			94.9	50 - 150
D 49 13C5_PFHxA	552268	541281			98	50 - 150
15 PFHxA			1000.00	1061.66	106.2	70 - 130
22 PFPeS			938.00	937.80	100	70 - 130
28 GenX			2000.00	1869.77	93.5	70 - 130
D 66 13C3_GenX	1119610	1062369			94.9	50 - 150
D 47 13C4_PFHpA	455905	459972			100.9	50 - 150
13 PFHpA			1000.00	995.78	99.6	70 - 130
D 45 13C3_PFHxS	127338	127834			100.4	50 - 150
14 PFHxS			910.00	897.23	98.6	70 - 130
29 ADONA			942.00	958.04	101.7	70 - 130
D 64 13C2_6:2 FTS_2	110710	117215			105.9	50 - 150
2 6:2 FTS			948.00	1031.67	108.8	70 - 130
D 53 13C8_PFOA	472194	457407			96.9	50 - 150
20 PFOA			1000.00	969.97	97	70 - 130
12 PFHpS			952.00	1027.12	107.9	70 - 130
18 PFOS			928.00	939.06	101.2	70 - 130
D 54 13C8_PFOS	135402	136777			101	50 - 150
17 PFNA			1000.00	982.13	98.2	70 - 130
D 56 13C9_PFNA	588924	586065			99.5	50 - 150
30 9Cl-PF3ONS			932.00	873.97	93.8	70 - 130
D 55 13C8_PFOSA	246128	252220			102.5	50 - 150
19 PFOSA			1000.00	949.39	94.9	70 - 130
16 PFNS			960.00	943.71	98.3	70 - 130
D 65 13C2_8:2 FTS_2	496935	483191			97.2	50 - 150
3 8:2 FTS			958.00	944.05	98.5	70 - 130
10 PFDA			1000.00	926.95	92.7	70 - 130
D 51 13C6_PFDA	731005	710956			97.3	50 - 150
6 N-MeFOSAA			1000.00	994.47	99.4	70 - 130

Report Date: 17-Aug-2021 18:17:29 AIM Revision: 2.0 19-Apr-2021 11:30:40
Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621045.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	771140	837174			108.6	50 - 150
9 PFDS			964.00	838.46	87	70 - 130
D 60 d5-EtFOSAA	722676	676493			93.6	50 - 150
D 52 13C7_PFUdA	586419	619559			105.7	50 - 150
5 N-EtFOSAA			1000.00	1052.38	105.2	70 - 130
25 PFUdA			1000.00	1031.18	103.1	70 - 130
D 61 d7-MeFOSE	77726	77201			99.3	50 - 150
32 MeFOSE			1000.00	956.67	95.7	70 - 130
D 57 d3-MeFOSA	49045	44487			90.7	50 - 150
26 MeFOSA			1000.00	966.85	96.7	70 - 130
31 11Cl-PF3OUDS			942.00	898.89	95.4	70 - 130
D 62 d9-EtFOSE	89034	92677			104.1	50 - 150
33 EtFOSE			1000.00	1001.21	100.1	70 - 130
D 59 d5-EtFOSA	42128	41241			97.9	50 - 150
27 EtFOSA			1000.00	941.73	94.2	70 - 130
11 PFDoA			1000.00	1030.02	103	70 - 130
D 38 13C2_PFDoA	621860	607960			97.8	50 - 150
4 10:2 FTS			964.00	271.47	28.2	70 - 130
34 PFDOS			968.00	922.45	95.3	70 - 130
24 PFTrDA			1000.00	1060.40	106	70 - 130
23 PFTeDA			1000.00	1008.63	100.9	70 - 130
D 42 13C2_PFTeDA	808961	791433			97.8	50 - 150
35 PFHxDA			1000.00	957.91	95.8	70 - 130
D 40 13C2_PFHxDA	887847	909520			102.4	50 - 150
36 PFODA			1000.00	992.45	99.2	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\081621-DOD.b\081621045.d
Injection Date: 16-Aug-2021 19:59:02 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 37
Sample Info: ID CCV 1000B_SVLC-1600 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.718	1.718	0	542026	21	>100:1			1000.00	975.87	97.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.724	1.718	1/1	548701	22	>100:1			1000.00	1012.89		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.098	2.099	1	504732	16	>100:1			1000.00	969.64	97.6	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.098	2.099	1/0	549626	16	>100:1			1000.00	998.72		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.151	2.151	0	170174	14	>100:1			1000.00	948.59	103.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.151	2.151	0/0	183841	16	>100:1	Target = 3.26		884.00	906.10		
298.9 > 99	44	2.151	2.151		55234	21	>100:1	3.32 (1.63-4.90)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.496	2.496	1/1	143207	18	>100:1	Target = 3.15		938.00	937.80		
349 > 99	44	2.505	2.496		46020	17	>100:1	3.11 (1.57-4.72)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.425	2.425	1	112137	18	>100:1			5000.00	5612.35	94.9	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.433	2.434	1/0	49127	17		Target = 1.68		934.00	1017.11		
327 > 81	63	2.425	2.434		27188	17	38:1	1.80 (0.84-2.53)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.469	2.469	1	541281	17	>100:1			1000.00	925.43	98	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.469	2.469	1/0	600466	17	>100:1	Target = 18.18		1000.00	1061.66		
313 > 119	49	2.469	2.469		30511	17	>100:1	19.68 (9.09-27.27)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.583	2.583	1	1062369	18	>100:1			5000.00	4933.97	94.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.583	2.583	1/0	277418	19	>100:1	Target = 0.79		2000.00	1869.77		
285 > 185	66	2.583	2.583		360248	18	>100:1	0.77 (0.39-1.19)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.845	2.846	1	459972	16	>100:1			1000.00	950.88	100.9	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.845	2.846	1/0	511656	19	>100:1	Target = 3.65		1000.00	995.78		
363 > 169	47	2.845	2.846		145328	18	>100:1	3.52 (1.82-5.48)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.854	2.855	0	127834	17	>100:1			1000.00	952.03	100.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.864	2.855	1/1	125633	25	>100:1	Target = 3.10	0.19	910.00	897.23		
399 > 99	45	2.864	2.855		46951	26	>100:1	2.67 (1.55-4.66)	0.08				M

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.888	2.889	1/1	806899	20	>100:1	Target = 3.01		942.00	958.04		
377 > 85	45	2.888	2.889		265285	19	>100:1	3.04 (1.50-4.52)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.241	3.240	1/1	124936	22	>100:1	Target = 2.85		952.00	1027.12		
449 > 99	45	3.241	3.240		41166	21	>100:1	3.03 (1.42-4.28)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.208	3.207	1	117215	20	>100:1			5000.00	7264.51	105.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.208	3.207	1/0	58794	20	>100:1	Target = 1.74		948.00	1031.67		
427 > 81	64	3.208	3.207		29713	28	>100:1	1.97 (0.87-2.62)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.234	3.233	1	457407	22	>100:1			1000.00	981.97	96.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.234	3.233	1/0	441595	29	>100:1	Target = 2.92		1000.00	969.97		
413 > 169	53	3.234	3.233		156795	21	>100:1	2.81 (1.46-4.38)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.609	3.608	0	136777	21	>100:1			1000.00	1028.15	101	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.617	3.616	1/1	145584	38	>100:1	Target = 3.34	0.28	928.00	939.06		M
499 > 99	54	3.609	3.616		42374	33	>100:1	3.43 (1.67-5.02)	0.12				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.822	3.828	0/0	453358	18	>100:1			932.00	873.97		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.964	3.962	0/0	105634	15	>100:1	Target = 2.63		960.00	943.71		
549 > 99	54	3.964	3.962		42569	22	>100:1	2.48 (1.31-3.95)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.278	4.264	1/1	94793	22	>100:1	Target = 2.65		964.00	838.46		
599 > 99	54	4.278	4.264		36357	14	>100:1	2.60 (1.32-3.98)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.446	4.443	1/1	408974	19	>100:1			942.00	898.89		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.800	4.798	1/1	94449	21	>100:1	Target = 3.08		968.00	922.45		
699 > 99	54	4.800	4.798		30130	27		3.13 (1.54-4.63)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.617	3.616	0	586065	21	>100:1			1000.00	1028.67	99.5	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.617	3.624	0/0	633080	22	>100:1	Target = 6.55		1000.00	982.13		
463 > 169	56	3.617	3.624		90501	20	>100:1	6.99 (3.27-9.83)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.871	3.869	1	252220	18	>100:1			1000.00	924.19	102.5	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.871	3.869	0/-1	268261	20	>100:1	Target = 33.36		1000.00	949.39		
498>478	55	3.871	3.869		7539	13	69:1	35.58 (16.68-50.04)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.974	3.971	1	483191	17	>100:1			5000.00	25290	97.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.974	3.971	1/0	204321	19	>100:1	Target = 2.44		958.00	944.05		
527 > 81	65	3.974	3.971		107660	17	>100:1	1.89 (1.22-3.67)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.595	4.583	1/0	67716	17		Target = 3.72		964.00	271.47		
627 > 80	65	4.586	4.583		18948	24	86:1	3.57 (1.86-5.59)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.974	3.981	0	710956	18	>100:1			1000.00	1302.50	97.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.985	3.971	1/1	765847	18	>100:1	Target = 13.09		1000.00	926.95		
513 > 169	51	3.985	3.971		55862	22	>100:1	13.70 (6.54-19.63)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.143	4.139	1	837174	18	>100:1			5000.00	6692.31	108.6	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.143	4.139	1/0	136355	31		Target = 1.36	0.11	1000.00	994.47		M
570 > 483	58	4.143	4.139		103509	32	>100:1	1.31 (0.68-2.04)	0.35				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.298	4.294	0	619559	17	>100:1			1000.00	1045.60	105.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.298	4.294	1/1	604794	16	>100:1	Target = 14.48		1000.00	1031.18		
563 > 169	52	4.298	4.294		38372	11	97:1	15.76 (7.24-21.72)					M
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.298	4.294	0	676493	16	>100:1			5000.00	6083.03	93.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.308	4.304	1/1	149368	31	>100:1	Target = 1.63	0.08	1000.00	1052.38		M
584 > 526	60	4.308	4.304		94279	31	>100:1	1.58 (0.81-2.44)	0.23				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.288	4.294	0	77201	16	>100:1			1000.00	926.28	99.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.298	4.294	0/0	83208	14	>100:1			1000.00	956.67		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.308	4.315	0	44487	19	>100:1			1000.00	882.59	90.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.318	4.304	1/1	45544	15	>100:1	Target = 1.09		1000.00	966.85		
512 > 219	57	4.308	4.304		45848	13	85:1	0.99 (0.54-1.64)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.455	4.452	1	92677	16	>100:1			1000.00	990.50	104.1	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.464	4.470	0/-1	88640	15	>100:1			1000.00	1001.21		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.473	4.479	0	41241	18	>100:1			1000.00	932.64	97.9	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.482	4.479	0/0	43863	17	>100:1	Target = 1.02		1000.00	941.73		
526 > 219	59	4.482	4.479		48082	16	>100:1	0.91 (0.51-1.54)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.578	4.575	1	607960	19	>100:1			1000.00	1042.31	97.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.578	4.575	0/-1	662691	18	>100:1	Target = 10.77		1000.00	1030.02		
613 > 169	38	4.578	4.575		58700	18	>100:1	11.28 (5.38-16.16)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.834	4.824	1/0	607499	19	>100:1	Target = 8.06		1000.00	1060.40		
663 > 169	38	4.834	4.824		70476	18	>100:1	8.61 (4.03-12.10)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.063	5.062	1	791433	22	>100:1			1000.00	884.75	97.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.063	5.062	1/0	641796	22	>100:1	Target = 11.68		1000.00	1008.63		
713 > 169	42	5.063	5.062		54649	22	>100:1	11.74 (5.84-17.52)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.488	5.487	1	909520	22	>100:1			1000.00	1087.87	102.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.495	5.487	1/0	604765	22	>100:1	Target = 10.53		1000.00	957.91		
813 > 269	40	5.495	5.487		58548	22	>100:1	10.32 (5.26-15.80)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.931	5.925	1/0	779869	46	95:1	Target = 13.30		1000.00	992.45		
913 > 319	40	5.931	5.925		59855	46	>100:1	13.02 (6.65-19.96)					
*** 37 13C2_PFDA**													
515 > 470		3.985	3.981	1	836314	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.469	2.469	1	562635	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.234	3.233	1	462539	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.724	1.718	1	508804	21	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.617	3.608	1	138619	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021042.d
Injection Date: 20-Aug-2021 22:58:13 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 30
Sample Info: ID CCV 1000_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	984.65	98.5	70 - 130
D 46 13C4_PFBA	612112	630167			102.9	50 - 150
D 50 13C5_PFPeA	629666	658952			104.7	50 - 150
21 PFPeA			1000.00	967.08	96.7	70 - 130
7 PFBS			884.00	858.06	97.1	70 - 130
D 44 13C3_PFBS	193652	201486			104	50 - 150
1 4:2 FTS			934.00	952.13	101.9	70 - 130
D 63 13C2_4:2 FTS_2	105591	111052			105.2	50 - 150
D 49 13C5_PFHxA	649325	690778			106.4	50 - 150
15 PFHxA			1000.00	983.94	98.4	70 - 130
22 PFPeS			938.00	923.81	98.5	70 - 130
28 GenX			2000.00	1913.93	95.7	70 - 130
D 66 13C3_GenX	1220862	1283413			105.1	50 - 150
D 47 13C4_PFHpA	573719	550518			96	50 - 150
13 PFHpA			1000.00	934.48	93.4	70 - 130
D 45 13C3_PFHxS	146711	153786			104.8	50 - 150
14 PFHxS			910.00	892.69	98.1	70 - 130
29 ADONA			942.00	906.05	96.2	70 - 130
2 6:2 FTS			948.00	887.23	93.6	70 - 130
D 64 13C2_6:2 FTS_2	96908	101535			104.8	50 - 150
D 53 13C8_PFOA	563802	606268			107.5	50 - 150
20 PFOA			1000.00	962.65	96.3	70 - 130
12 PFHpS			952.00	969.98	101.9	70 - 130
D 54 13C8_PFOS	149352	146774			98.3	50 - 150
18 PFOS			928.00	985.99	106.2	70 - 130
17 PFNA			1000.00	1038.34	103.8	70 - 130
D 56 13C9_PFNA	662557	665004			100.4	50 - 150
30 9Cl-PF3ONS			932.00	943.21	101.2	70 - 130
D 55 13C8_PFOSA	313093	316758			101.2	50 - 150
19 PFOSA			1000.00	1054.10	105.4	70 - 130
16 PFNS			960.00	990.96	103.2	70 - 130
D 65 13C2_8:2 FTS_2	110833	108731			98.1	50 - 150
10 PFDA			1000.00	1013.28	101.3	70 - 130
3 8:2 FTS			958.00	858.12	89.6	70 - 130
D 51 13C6_PFDA	663112	653587			98.6	50 - 150
D 58 d3-MeFOSAA	663389	682159			102.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1000.65	100.1	70 - 130
9 PFDS			964.00	1002.52	104	70 - 130
25 PFUdA			1000.00	1036.57	103.7	70 - 130
D 60 d5-EtFOSAA	633381	626163			98.9	50 - 150
D 52 13C7_PFUdA	681974	694245			101.8	50 - 150
5 N-EtFOSAA			1000.00	1009.03	100.9	70 - 130
D 61 d7-MeFOSE	103682	111294			107.3	50 - 150
D 57 d3-MeFOSA	48151	58320			121.1	50 - 150
32 MeFOSE			1000.00	957.28	95.7	70 - 130
26 MeFOSA			1000.00	976.55	97.7	70 - 130
31 11Cl-PF3OUDS			942.00	910.14	96.6	70 - 130
D 62 d9-EtFOSE	112837	122179			108.3	50 - 150
33 EtFOSE			1000.00	1036.03	103.6	70 - 130
D 59 d5-EtFOSA	50649	49176			97.1	50 - 150
27 EtFOSA			1000.00	1088.00	108.8	70 - 130
11 PFDoA			1000.00	1070.35	107	70 - 130
D 38 13C2_PFDoA	687538	688605			100.2	50 - 150
4 10:2 FTS			964.00	997.08	103.4	70 - 130
34 PFDOS			968.00	955.47	98.7	70 - 130
24 PFTrDA			1000.00	1055.00	105.5	70 - 130
D 42 13C2_PFTeDA	948336	971149			102.4	50 - 150
23 PFTeDA			1000.00	998.53	99.9	70 - 130
35 PFHxDA			1000.00	982.94	98.3	70 - 130
D 40 13C2_PFHxDA	930923	977932			105	50 - 150
36 PFODA			1000.00	942.83	94.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021042.d
Injection Date: 20-Aug-2021 22:58:13 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 30
Sample Info: ID CCV 1000_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.709	1.711	0	630167	20	>100:1			1000.00	1048.31	102.9	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.715	1.711	1/1	652675	20	>100:1			1000.00	984.65		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.083	2.077	1	658952	16	>100:1			1000.00	1060.59	104.7	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.083	2.088	0/-1	683971	15	>100:1			1000.00	967.08		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.136	2.141	0	201486	15	>100:1			1000.00	1067.30	104	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.136	2.141	0/0	225227	16	>100:1	Target = 3.41		884.00	858.06		
298.9 > 99	44	2.136	2.141		67776	15	>100:1	3.32 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.477	2.478	0/0	160305	17	>100:1	Target = 2.92		938.00	923.81		
349 > 99	44	2.477	2.478		57798	18	>100:1	2.77 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.407	0	111052	16	>100:1			5000.00	5348.77	105.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.407	0/0	44851	17	>100:1	Target = 1.58		934.00	952.13		
327 > 81	63	2.406	2.407		21881	17	>100:1	2.04 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.441	2.442	0	690778	17	>100:1			1000.00	1045.74	106.4	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.441	2.442	0/0	688549	18	>100:1	Target = 18.69		1000.00	983.94		
313 > 119	49	2.441	2.442		31742	16	>100:1	21.69 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.566	2.558	1	1283413	18	>100:1			5000.00	5433.96	105.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.557	2.558	0/-1	336767	18	>100:1	Target = 0.78		2000.00	1913.93		
285 > 185	66	2.566	2.558		438411	18	>100:1	0.76 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.826	2.818	1	550518	18	>100:1			1000.00	1027.15	96	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.826	2.818	1/0	574513	17	>100:1	Target = 3.75		1000.00	934.48		
363 > 169	47	2.826	2.818		160405	16	>100:1	3.58 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.835	2.836	0	153786	16	>100:1			1000.00	1080.41	104.8	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.835	2.836	0/0	150814	25	>100:1	Target = 2.79	0.18	910.00	892.69		
399 > 99	45	2.835	2.836		48373	22	>100:1	3.11 (1.39-4.19)	0.11				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.862	2.864	0/0	976988	18	>100:1	Target = 3.21		942.00	906.05		
377 > 85	45	2.862	2.864		315317	18	>100:1	3.09 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.218	3.208	1/1	157002	20	>100:1	Target = 3.03		952.00	969.98		
449 > 99	45	3.218	3.208		54469	20	>100:1	2.88 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.185	3.181	1	101535	21	>100:1			5000.00	5622.40	104.8	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.185	3.174	1/0	45443	20	>100:1	Target = 1.94		948.00	887.23		
427 > 81	64	3.178	3.174		25201	17	>100:1	1.80 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.205	3.201	1	606268	20	>100:1			1000.00	1077.40	107.5	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.211	3.201	1/0	582367	20	>100:1	Target = 2.91		1000.00	962.65		
413 > 169	53	3.211	3.201		203536	20	>100:1	2.86 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.590	3.577	1	146774	20	>100:1			1000.00	1022.33	98.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.590	3.585	1/0	164992	36	>100:1	Target = 3.38	0.26	928.00	985.99		M
499 > 99	54	3.590	3.585		45094	33	>100:1	3.65 (1.69-5.07)	0.04				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.802	3.790	1/0	515432	19	>100:1			932.00	943.21		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.941	3.920	2/1	122937	16	>100:1	Target = 2.80		960.00	990.96		
549 > 99	54	3.933	3.920		43558	15	>100:1	2.82 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.250	4.237	1/0	121139	14	>100:1	Target = 3.15		964.00	1002.52		
599 > 99	54	4.250	4.237		40600	14		2.98 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.407	4.398	1/0	430782	17	>100:1			942.00	910.14		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.758	4.742	2/1	100955	19	>100:1	Target = 3.01		968.00	955.47		
699 > 99	54	4.758	4.742		34200	18	>100:1	2.95 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.590	3.585	1	665004	18	>100:1			1000.00	1006.90	100.4	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.590	3.585	1/0	738676	19	>100:1	Target = 6.48		1000.00	1038.34		
463 > 169	56	3.598	3.585		123119	20	>100:1	5.99 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.875	3.863	1	316758	19	>100:1			1000.00	1054.82	101.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.867	3.863	1/0	348767	18	>100:1	Target = 32.22		1000.00	1054.10		
498>478	55	3.875	3.863		9630	22	68:1	36.21 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.941	3.928	1	108731	17	>100:1			5000.00	5160.98	98.1	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.941	3.937	1/0	41436	16	>100:1	Target = 1.96		958.00	858.12		
527 > 81	65	3.941	3.937		22248	15	>100:1	1.86 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.556	4.535	2/1	63907	22	>100:1	Target = 3.34		964.00	997.08		
627 > 80	65	4.556	4.535		20115	17	>100:1	3.17 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.950	3.937	1	653587	18	>100:1			1000.00	1031.29	98.6	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.950	3.937	1/0	733195	18	>100:1	Target = 13.93		1000.00	1013.28		
513 > 169	51	3.950	3.937		53380	16	>100:1	13.73 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.109	4.098	1	682159	18	>100:1			5000.00	5089.17	102.8	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.109	4.107	1/0	110031	31	>100:1	Target = 1.31	0.10	1000.00	1000.65		M
570 > 483	58	4.109	4.107		89083	30	>100:1	1.23 (0.65-1.97)					M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.260	4.257	1	694245	17	>100:1			1000.00	1033.41	101.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.270	4.257	1/0	649527	16	>100:1	Target = 14.01		1000.00	1036.57		
563 > 169	52	4.270	4.257		46987	13	>100:1	13.82 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.270	4.257	1	626163	16	>100:1			5000.00	5187.66	98.9	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.270	4.267	1/0	130241	33	>100:1	Target = 1.75		1000.00	1009.03		M
584 > 526	60	4.270	4.267		78881	29	>100:1	1.65 (0.87-2.62)	0.31				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.300	4.287	1	111294	14	>100:1			1000.00	1063.85	107.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.311	4.308	1/0	120645	14	>100:1			1000.00	957.28		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.321	4.308	1	58320	14	>100:1			1000.00	1048.80	121.1	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.321	4.318	1/0	63221	13	>100:1	Target = 1.04		1000.00	976.55		
512 > 219	57	4.321	4.318		63280	13	>100:1	0.99 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.467	4.454	1	122179	14	>100:1			1000.00	1025.36	108.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.476	4.472	1/0	116530	23	>100:1			1000.00	1036.03		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.476	4.481	0	49176	14	>100:1			1000.00	963.96	97.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.494	4.481	1/1	61617	21	>100:1	Target = 1.05		1000.00	1088.00		
526 > 219	59	4.494	4.481		59575	15	>100:1	1.03 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.539	4.526	1	688605	17	>100:1			1000.00	1018.49	100.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.539	4.526	1/0	782891	16	>100:1	Target = 10.52		1000.00	1070.35		
613 > 169	38	4.539	4.526		68993	17	>100:1	11.34 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.785	4.769	1/0	658518	21	>100:1	Target = 7.51		1000.00	1055.00		
663 > 169	38	4.785	4.769		82348	21	>100:1	7.99 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.008	4.992	1	971149	21	>100:1			1000.00	1029.47	102.4	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.008	4.998	1/0	799591	21	>100:1	Target = 11.12		1000.00	998.53		
713 > 169	42	5.008	4.998		74333	20	>100:1	10.75 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.411	5.390	2	977932	19	>100:1			1000.00	1059.30	105	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.411	5.390	2/0	681706	19	>100:1	Target = 10.69		1000.00	982.94		
813 > 269	40	5.411	5.390		63303	18	>100:1	10.76 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.800	5.775	2/0	813413	26	72:1	Target = 13.29		1000.00	942.83		
913 > 319	40	5.793	5.775		61722	25	>100:1	13.17 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.950	3.937	1	750537	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.441	2.442	0	715437	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.205	3.201	1	622512	22	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.709	1.711	0	613737	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.590	3.577	1	155543	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021054.d
Injection Date: 21-Aug-2021 01:05:54 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 42
Sample Info: ID CCV 1000A_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	1014.51	101.5	70 - 130
D 46 13C4_PFBA	612112	627791			102.6	50 - 150
D 50 13C5_PFPeA	629666	658008			104.5	50 - 150
21 PFPeA			1000.00	995.72	99.6	70 - 130
7 PFBS			884.00	917.40	103.8	70 - 130
D 44 13C3_PFBS	193652	196665			101.6	50 - 150
1 4:2 FTS			934.00	872.91	93.5	70 - 130
D 63 13C2_4:2 FTS_2	105591	119959			113.6	50 - 150
D 49 13C5_PFHxA	649325	684018			105.3	50 - 150
15 PFHxA			1000.00	989.33	98.9	70 - 130
22 PFPeS			938.00	936.79	99.9	70 - 130
28 GenX			2000.00	1937.02	96.9	70 - 130
D 66 13C3_GenX	1220862	1308633			107.2	50 - 150
D 47 13C4_PFHpA	573719	591508			103.1	50 - 150
13 PFHpA			1000.00	960.87	96.1	70 - 130
D 45 13C3_PFHxS	146711	157399			107.3	50 - 150
14 PFHxS			910.00	904.75	99.4	70 - 130
29 ADONA			942.00	921.32	97.8	70 - 130
2 6:2 FTS			948.00	943.57	99.5	70 - 130
D 64 13C2_6:2 FTS_2	96908	101666			104.9	50 - 150
D 53 13C8_PFOA	563802	590541			104.7	50 - 150
20 PFOA			1000.00	984.05	98.4	70 - 130
12 PFHpS			952.00	888.79	93.4	70 - 130
D 54 13C8_PFOS	149352	150279			100.6	50 - 150
18 PFOS			928.00	840.76	90.6	70 - 130
17 PFNA			1000.00	897.15	89.7	70 - 130
D 56 13C9_PFNA	662557	740685			111.8	50 - 150
30 9Cl-PF3ONS			932.00	936.12	100.4	70 - 130
D 55 13C8_PFOSA	313093	313935			100.3	50 - 150
19 PFOSA			1000.00	1014.98	101.5	70 - 130
16 PFNS			960.00	949.68	98.9	70 - 130
D 65 13C2_8:2 FTS_2	110833	117205			105.7	50 - 150
10 PFDA			1000.00	1069.47	106.9	70 - 130
3 8:2 FTS			958.00	887.72	92.7	70 - 130
D 51 13C6_PFDA	663112	664829			100.3	50 - 150
D 58 d3-MeFOSAA	663389	729181			109.9	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1061.37	106.1	70 - 130
9 PFDS			964.00	1028.93	106.7	70 - 130
25 PFUdA			1000.00	1035.95	103.6	70 - 130
D 60 d5-EtFOSAA	633381	684379			108.1	50 - 150
D 52 13C7_PFUdA	681974	728247			106.8	50 - 150
5 N-EtFOSAA			1000.00	952.42	95.2	70 - 130
D 61 d7-MeFOSE	103682	110041			106.1	50 - 150
D 57 d3-MeFOSA	48151	50773			105.4	50 - 150
32 MeFOSE			1000.00	957.10	95.7	70 - 130
26 MeFOSA			1000.00	1094.27	109.4	70 - 130
31 11Cl-PF3OUDS			942.00	930.04	98.7	70 - 130
D 62 d9-EtFOSE	112837	126130			111.8	50 - 150
33 EtFOSE			1000.00	1054.99	105.5	70 - 130
D 59 d5-EtFOSA	50649	50833			100.4	50 - 150
27 EtFOSA			1000.00	983.44	98.3	70 - 130
11 PFDoA			1000.00	1029.84	103	70 - 130
D 38 13C2_PFDoA	687538	723740			105.3	50 - 150
4 10:2 FTS			964.00	894.61	92.8	70 - 130
34 PFDOS			968.00	964.41	99.6	70 - 130
24 PFTrDA			1000.00	1045.62	104.6	70 - 130
D 42 13C2_PFTeDA	948336	956571			100.9	50 - 150
23 PFTeDA			1000.00	1055.05	105.5	70 - 130
35 PFHxDA			1000.00	972.01	97.2	70 - 130
D 40 13C2_PFHxDA	930923	993976			106.8	50 - 150
36 PFODA			1000.00	950.90	95.1	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021054.d
Injection Date: 21-Aug-2021 01:05:54 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 42
Sample Info: ID CCV 1000A_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.713	1.711	1	627791	19	>100:1			1000.00	1044.36	102.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.713	1.711	1/0	669935	20	>100:1			1000.00	1014.51		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.083	2.077	1	658008	17	>100:1			1000.00	1059.08	104.5	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.083	2.088	0/-1	703215	15	>100:1			1000.00	995.72		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.136	2.141	0	196665	15	>100:1			1000.00	1041.76	101.6	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.136	2.141	0/0	235042	15	>100:1	Target = 3.41		884.00	917.40		
298.9 > 99	44	2.136	2.141		67322	16	>100:1	3.49 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	0/0	158669	16	>100:1	Target = 2.92		938.00	936.79		
349 > 99	44	2.478	2.478		55301	16	>100:1	2.86 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.406	2.407	0	119959	16	>100:1			5000.00	5777.78	113.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.406	2.407	0/0	44417	19		Target = 1.58		934.00	872.91		
327 > 81	63	2.406	2.407		24843	15	>100:1	1.78 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	0	684018	17	>100:1			1000.00	1035.50	105.3	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	0/0	685542	18	>100:1	Target = 18.69		1000.00	989.33		
313 > 119	49	2.442	2.442		34487	17	>100:1	19.87 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1308633	17	>100:1			5000.00	5540.75	107.2	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.558	1/1	347452	17	>100:1	Target = 0.78		2000.00	1937.02		
285 > 185	66	2.558	2.558		464219	17	>100:1	0.74 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.819	2.818	1	591508	18	>100:1			1000.00	1103.62	103.1	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.819	2.818	1/0	634722	17	>100:1	Target = 3.75		1000.00	960.87		
363 > 169	47	2.819	2.818		176210	17	>100:1	3.60 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.837	2.836	1	157399	16	>100:1			1000.00	1105.80	107.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.837	2.836	1/0	156442	25	>100:1	Target = 2.79	0.17	910.00	904.75		
399 > 99	45	2.837	2.836		47655	25	>100:1	3.28 (1.39-4.19)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/0	1016800	18	>100:1	Target = 3.21		942.00	921.32		
377 > 85	45	2.864	2.864		306527	17	>100:1	3.31 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.215	3.208	1/0	147241	20	>100:1	Target = 3.03		952.00	888.79		
449 > 99	45	3.215	3.208		49456	20	>100:1	2.97 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.182	3.181	1	101666	21	>100:1			5000.00	5629.65	104.9	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.188	3.174	1/0	48391	21	>100:1	Target = 1.94		948.00	943.57		
427 > 81	64	3.188	3.174		22973	18	>100:1	2.10 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.215	3.201	1	590541	21	>100:1			1000.00	1049.45	104.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.208	3.201	1/0	579870	20	>100:1	Target = 2.91		1000.00	984.05		
413 > 169	53	3.208	3.201		211858	21	>100:1	2.73 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.587	3.577	1	150279	19	>100:1			1000.00	1046.74	100.6	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.595	3.585	1/0	144050	35	>100:1	Target = 3.38	0.26	928.00	840.76		
499 > 99	54	3.595	3.585		44668	34	>100:1	3.22 (1.69-5.07)	0.14				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.800	3.790	1/0	523776	19	>100:1			932.00	936.12		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.939	3.920	2/1	120630	18	>100:1	Target = 2.80		960.00	949.68		
549 > 99	54	3.939	3.920		41784	18		2.88 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.251	4.237	1/0	127300	17	>100:1	Target = 3.15		964.00	1028.93		
599 > 99	54	4.251	4.237		45731	14	>100:1	2.78 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.407	4.398	1/0	450716	16	>100:1			942.00	930.04		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.759	4.742	2/1	104333	20	>100:1	Target = 3.01		968.00	964.41		
699 > 99	54	4.759	4.742		35149	25		2.96 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.595	3.585	1	740685	19	>100:1			1000.00	1121.49	111.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.595	3.585	1/0	710872	19	>100:1	Target = 6.48		1000.00	897.15		
463 > 169	56	3.595	3.585		113632	18	>100:1	6.25 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.873	3.863	1	313935	18	>100:1			1000.00	1045.42	100.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.873	3.863	1/0	332831	17	>100:1	Target = 32.22		1000.00	1014.98		
498>478	55	3.881	3.863		8798	22	69:1	37.83 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.939	3.928	1	117205	23	>100:1			5000.00	5563.21	105.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.939	3.937	1/0	46206	22	>100:1	Target = 1.96		958.00	887.72		
527 > 81	65	3.939	3.937		26126	22	>100:1	1.76 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.556	4.535	2/1	61808	24	>100:1	Target = 3.34		964.00	894.61		
627 > 80	65	4.556	4.535		20739	16	>100:1	2.98 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.948	3.937	1	664829	17	>100:1			1000.00	1049.03	100.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.948	3.937	1/0	787164	18	>100:1	Target = 13.93		1000.00	1069.47		
513 > 169	51	3.948	3.937		60242	22	>100:1	13.06 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.110	4.098	1	729181	17	>100:1			5000.00	5439.97	109.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.110	4.107	1/0	124753	29	>100:1	Target = 1.31	0.09	1000.00	1061.37		M
570 > 483	58	4.119	4.107		79280	36	>100:1	1.57 (0.65-1.97)	0.27				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.261	4.257	1	728247	16				1000.00	1084.03	106.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.271	4.257	1/0	680933	17	>100:1	Target = 14.01		1000.00	1035.95		
563 > 169	52	4.271	4.257		40002	15	>100:1	17.02 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.271	4.257	1	684379	15	>100:1			5000.00	5669.97	108.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.271	4.267	1/0	134364	35	>100:1	Target = 1.75	0.07	1000.00	952.42		M
584 > 526	60	4.271	4.267		85359	27	>100:1	1.57 (0.87-2.62)	0.28				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.291	4.287	1	110041	17	>100:1			1000.00	1051.88	106.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.301	4.308	0/-1	119265	15	>100:1			1000.00	957.10		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.311	4.308	1	50773	15	79:1			1000.00	913.08	105.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.321	4.318	1/0	61675	13	>100:1	Target = 1.04		1000.00	1094.27		
512 > 219	57	4.321	4.318		59908	13	>100:1	1.02 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.458	4.454	1	126130	14	>100:1			1000.00	1058.52	111.8	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.476	4.472	1/0	122462	15	>100:1			1000.00	1054.99		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.485	4.481	1	50833	17	>100:1			1000.00	996.44	100.4	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.485	4.481	1/0	57572	21	>100:1	Target = 1.05		1000.00	983.44		
526 > 219	59	4.494	4.481		61139	15	>100:1	0.94 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.539	4.526	1	723740	18	>100:1			1000.00	1070.45	105.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.539	4.526	1/0	791701	17	>100:1	Target = 10.52		1000.00	1029.84		
613 > 169	38	4.539	4.526		69855	15	>100:1	11.33 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.785	4.769	2/1	685969	19	>100:1	Target = 7.51		1000.00	1045.62		
663 > 169	38	4.785	4.769		89613	20	>100:1	7.65 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.014	4.992	2	956571	20	>100:1			1000.00	1014.02	100.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.014	4.998	1/-1	832172	21	>100:1	Target = 11.12		1000.00	1055.05		
713 > 169	42	5.008	4.998		70724	21	>100:1	11.76 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.411	5.390	2	993976	18	>100:1			1000.00	1076.68	106.8	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.411	5.390	2/0	685181	19	>100:1	Target = 10.69		1000.00	972.01		
813 > 269	40	5.411	5.390		62277	19	>100:1	11.00 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.801	5.775	2/0	833835	26	70:1	Target = 13.29		1000.00	950.90		
913 > 319	40	5.801	5.775		64368	35	>100:1	12.95 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.948	3.937	1	812780	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	695366	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.201	1	634986	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.713	1.711	1	615461	19	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.587	3.577	1	161592	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021068.d
Injection Date: 21-Aug-2021 03:35:40 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 56
Sample Info: ID CCV 1000B_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	999.69	100	70 - 130
D 46 13C4_PFBA	612112	681437			111.3	50 - 150
D 50 13C5_PFPeA	629666	686731			109.1	50 - 150
21 PFPeA			1000.00	1023.53	102.4	70 - 130
7 PFBS			884.00	868.91	98.3	70 - 130
D 44 13C3_PFBS	193652	208008			107.4	50 - 150
1 4:2 FTS			934.00	913.39	97.8	70 - 130
D 63 13C2_4:2 FTS_2	105591	121748			115.3	50 - 150
D 49 13C5_PFHxA	649325	727913			112.1	50 - 150
15 PFHxA			1000.00	1093.87	109.4	70 - 130
22 PFPeS			938.00	1010.94	107.8	70 - 130
28 GenX			2000.00	1895.60	94.8	70 - 130
D 66 13C3_GenX	1220862	1413430			115.8	50 - 150
D 47 13C4_PFHpA	573719	624334			108.8	50 - 150
13 PFHpA			1000.00	943.94	94.4	70 - 130
D 45 13C3_PFHxS	146711	170267			116.1	50 - 150
14 PFHxS			910.00	920.78	101.2	70 - 130
29 ADONA			942.00	903.47	95.9	70 - 130
2 6:2 FTS			948.00	913.62	96.4	70 - 130
D 64 13C2_6:2 FTS_2	96908	106868			110.3	50 - 150
D 53 13C8_PFOA	563802	642009			113.9	50 - 150
20 PFOA			1000.00	994.76	99.5	70 - 130
12 PFHpS			952.00	926.10	97.3	70 - 130
D 54 13C8_PFOS	149352	174340			116.7	50 - 150
18 PFOS			928.00	821.24	88.5	70 - 130
17 PFNA			1000.00	994.14	99.4	70 - 130
D 56 13C9_PFNA	662557	768739			116	50 - 150
30 9Cl-PF3ONS			932.00	890.07	95.5	70 - 130
D 55 13C8_PFOSA	313093	359825			114.9	50 - 150
19 PFOSA			1000.00	924.40	92.4	70 - 130
16 PFNS			960.00	920.32	95.9	70 - 130
D 65 13C2_8:2 FTS_2	110833	123294			111.2	50 - 150
10 PFDA			1000.00	927.29	92.7	70 - 130
3 8:2 FTS			958.00	992.00	103.5	70 - 130
D 51 13C6_PFDA	663112	770479			116.2	50 - 150
D 58 d3-MeFOSAA	663389	792854			119.5	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1087.36	108.7	70 - 130
9 PFDS			964.00	971.16	100.7	70 - 130
25 PFUdA			1000.00	1034.08	103.4	70 - 130
D 60 d5-EtFOSAA	633381	724411			114.4	50 - 150
D 52 13C7_PFUdA	681974	810094			118.8	50 - 150
5 N-EtFOSAA			1000.00	945.17	94.5	70 - 130
D 61 d7-MeFOSE	103682	115171			111.1	50 - 150
D 57 d3-MeFOSA	48151	65149			135.3	50 - 150
32 MeFOSE			1000.00	1024.54	102.5	70 - 130
26 MeFOSA			1000.00	849.83	85	70 - 130
31 11Cl-PF3OUDS			942.00	864.88	91.8	70 - 130
D 62 d9-EtFOSE	112837	133361			118.2	50 - 150
33 EtFOSE			1000.00	1036.83	103.7	70 - 130
D 59 d5-EtFOSA	50649	56746			112	50 - 150
27 EtFOSA			1000.00	1045.90	104.6	70 - 130
11 PFDoA			1000.00	913.69	91.4	70 - 130
D 38 13C2_PFDoA	687538	827656			120.4	50 - 150
4 10:2 FTS			964.00	999.79	103.7	70 - 130
34 PFDOS			968.00	879.66	90.9	70 - 130
24 PFTrDA			1000.00	968.24	96.8	70 - 130
D 42 13C2_PFTeDA	948336	1053376			111.1	50 - 150
23 PFTeDA			1000.00	999.41	99.9	70 - 130
35 PFHxDA			1000.00	974.33	97.4	70 - 130
D 40 13C2_PFHxDA	930923	1071697			115.1	50 - 150
36 PFODA			1000.00	963.15	96.3	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021068.d
Injection Date: 21-Aug-2021 03:35:40 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 56
Sample Info: ID CCV 1000B_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.711	1.711	0	681437	20	>100:1			1000.00	1133.60	111.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.718	1.711	1/1	716556	20	>100:1			1000.00	999.69		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	686731	17	>100:1			1000.00	1105.31	109.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	754409	15	>100:1			1000.00	1023.53		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	208008	15	>100:1			1000.00	1101.84	107.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	235457	15	>100:1	Target = 3.41		884.00	868.91		
298.9 > 99	44	2.141	2.141		74065	14	>100:1	3.17 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	181104	17	>100:1	Target = 2.92		938.00	1010.94		
349 > 99	44	2.478	2.478		59949	16	>100:1	3.02 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	121748	18	>100:1			5000.00	5863.94	115.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.407	2.407	1/0	47170	17	>100:1	Target = 1.58		934.00	913.39		
327 > 81	63	2.407	2.407		26152	15	>100:1	1.80 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.451	2.442	1	727913	17	>100:1			1000.00	1101.95	112.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.442	2.442	1/0	806622	17	>100:1	Target = 18.69		1000.00	1093.87		
313 > 119	49	2.442	2.442		40030	18	>100:1	20.15 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.567	2.558	1	1413430	18	>100:1			5000.00	5984.45	115.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.558	2.558	1/0	367395	17	>100:1	Target = 0.78		2000.00	1895.60		
285 > 185	66	2.558	2.558		494369	19	>100:1	0.74 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	1	624334	16	>100:1			1000.00	1164.87	108.8	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.827	2.818	1/0	658143	17	>100:1	Target = 3.75		1000.00	943.94		
363 > 169	47	2.818	2.818		179669	16	>100:1	3.66 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	170267	17	>100:1			1000.00	1196.20	116.1	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/0	172230	25	>100:1	Target = 2.79	0.17	910.00	920.78		
399 > 99	45	2.836	2.836		55648	25	>100:1	3.09 (1.39-4.19)	0.10				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/0	1078612	17	>100:1	Target = 3.21		942.00	903.47		
377 > 85	45	2.864	2.864		341610	18	>100:1	3.15 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.213	3.208	1/0	165965	19	>100:1	Target = 3.03		952.00	926.10		
449 > 99	45	3.213	3.208		54120	21	>100:1	3.06 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.187	3.181	1	106868	19	>100:1			5000.00	5917.71	110.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.187	3.174	1/0	49252	20	>100:1	Target = 1.94		948.00	913.62		
427 > 81	64	3.180	3.174		21095	19	>100:1	2.33 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.207	3.201	1	642009	21	>100:1			1000.00	1140.91	113.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.207	3.201	1/0	637272	21	>100:1	Target = 2.91		1000.00	994.76		
413 > 169	53	3.207	3.201		216713	21	>100:1	2.94 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.584	3.577	1	174340	18	>100:1			1000.00	1214.33	116.7	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.584	3.585	0/-1	163234	35	>100:1	Target = 3.38	0.30	928.00	821.24		
499 > 99	54	3.592	3.585		47485	36	>100:1	3.43 (1.69-5.07)	0.09				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.796	3.790	1/0	577745	18	>100:1			932.00	890.07		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.935	3.920	1/0	135617	17	>100:1	Target = 2.80		960.00	920.32		
549 > 99	54	3.935	3.920		49077	18	>100:1	2.76 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.245	4.237	1/0	139390	15	>100:1	Target = 3.15		964.00	971.16		
599 > 99	54	4.245	4.237		51291	20	>100:1	2.71 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.403	4.398	1/0	486245	16	>100:1			942.00	864.88		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.753	4.742	1/0	110401	18	>100:1	Target = 3.01		968.00	879.66		
699 > 99	54	4.753	4.742		38555	18	>100:1	2.86 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.592	3.585	1	768739	20	>100:1			1000.00	1163.97	116	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.592	3.585	1/0	817552	18	>100:1	Target = 6.48		1000.00	994.14		
463 > 169	56	3.600	3.585		125064	19	>100:1	6.53 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.861	3.863	0	359825	19	>100:1			1000.00	1198.24	114.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.869	3.863	1/1	347441	17	>100:1	Target = 32.22		1000.00	924.40		
498>478	55	3.861	3.863		12023	22		28.89 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.935	3.928	1	123294	18				5000.00	5852.23	111.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.935	3.937	0/-1	54316	18	>100:1	Target = 1.96		958.00	992.00		
527 > 81	65	3.943	3.937		29984	18		1.81 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.550	4.535	1/0	72663	19	>100:1	Target = 3.34		964.00	999.79		
627 > 80	65	4.550	4.535		19739	17	>100:1	3.68 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.943	3.937	1	770479	18	>100:1			1000.00	1215.73	116.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.943	3.937	1/0	790974	17	>100:1	Target = 13.93		1000.00	927.29		
513 > 169	51	3.943	3.937		57811	23	>100:1	13.68 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.105	4.098	1	792854	18	>100:1			5000.00	5915.00	119.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.105	4.107	0/-1	138968	32	>100:1	Target = 1.31		1000.00	1087.36		M
570 > 483	58	4.105	4.107		92630	30	>100:1	1.50 (0.65-1.97)	0.21				
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.265	4.257	1	810094	15	>100:1			1000.00	1205.86	118.8	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.265	4.257	1/0	756094	15	>100:1	Target = 14.01		1000.00	1034.08		
563 > 169	52	4.265	4.257		50774	14	>100:1	14.89 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.265	4.257	1	724411	15	>100:1			5000.00	6001.63	114.4	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.265	4.267	0/-1	141141	36		Target = 1.75	0.08	1000.00	945.17		M
584 > 526	60	4.265	4.267		94780	29	>100:1	1.48 (0.87-2.62)	0.10				M
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.285	4.287	0	115171	13	>100:1			1000.00	1100.91	111.1	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.295	4.308	0/0	133621	13	>100:1			1000.00	1024.54		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.306	4.308	0	65149	13	>100:1			1000.00	1171.61	135.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.316	4.318	0/0	61460	15	>100:1	Target = 1.04		1000.00	849.83		
512 > 219	57	4.316	4.318		65360	15	>100:1	0.94 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.452	4.454	0	133361	16	>100:1			1000.00	1119.20	118.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.470	4.472	0/0	127292	15	>100:1			1000.00	1036.83		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.470	4.481	0	56746	17	>100:1			1000.00	1112.35	112	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.479	4.481	0/0	68351	14	>100:1	Target = 1.05		1000.00	1045.90		
526 > 219	59	4.479	4.481		61901	14	>100:1	1.10 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.542	4.526	1	827656	16	>100:1			1000.00	1224.15	120.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.542	4.526	1/0	803261	16	>100:1	Target = 10.52		1000.00	913.69		
613 > 169	38	4.542	4.526		82134	16	>100:1	9.77 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.786	4.769	2/1	726403	21	>100:1	Target = 7.51		1000.00	968.24		
663 > 169	38	4.786	4.769		100217	18	>100:1	7.24 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.003	4.992	1	1053376	21	>100:1			1000.00	1116.64	111.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.003	4.998	1/0	868057	21	>100:1	Target = 11.12		1000.00	999.41		
713 > 169	42	5.003	4.998		79021	20	>100:1	10.98 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.412	5.390	2	1071697	18	>100:1			1000.00	1160.87	115.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.412	5.390	2/0	740520	18	>100:1	Target = 10.69		1000.00	974.33		
813 > 269	40	5.412	5.390		66169	19	>100:1	11.19 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.801	5.775	2/0	910622	25	73:1	Target = 13.29		1000.00	963.15		
913 > 319	40	5.801	5.775		65020	25	>100:1	14.00 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.943	3.937	1	904625	18	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.442	1	766514	17	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.213	3.201	1	684478	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.711	1.711	0	666874	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.592	3.577	1	174901	19	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021081.d
Injection Date: 21-Aug-2021 05:54:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 69
Sample Info: ID CCV 1000C_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	997.56	99.8	70 - 130
D 46 13C4_PFBA	612112	664725			108.6	50 - 150
D 50 13C5_PFPeA	629666	682445			108.4	50 - 150
21 PFPeA			1000.00	983.40	98.3	70 - 130
7 PFBS			884.00	883.15	99.9	70 - 130
D 44 13C3_PFBS	193652	209015			107.9	50 - 150
1 4:2 FTS			934.00	936.11	100.2	70 - 130
D 63 13C2_4:2 FTS_2	105591	115295			109.2	50 - 150
D 49 13C5_PFHxA	649325	725960			111.8	50 - 150
15 PFHxA			1000.00	1046.46	104.6	70 - 130
22 PFPeS			938.00	951.22	101.4	70 - 130
28 GenX			2000.00	2068.43	103.4	70 - 130
D 66 13C3_GenX	1220862	1299297			106.4	50 - 150
D 47 13C4_PFHpA	573719	607962			106	50 - 150
13 PFHpA			1000.00	969.71	97	70 - 130
D 45 13C3_PFHxS	146711	157958			107.7	50 - 150
14 PFHxS			910.00	896.89	98.6	70 - 130
29 ADONA			942.00	940.28	99.8	70 - 130
2 6:2 FTS			948.00	894.51	94.4	70 - 130
D 64 13C2_6:2 FTS_2	96908	104995			108.3	50 - 150
D 53 13C8_PFOA	563802	624543			110.8	50 - 150
20 PFOA			1000.00	1026.40	102.6	70 - 130
12 PFHpS			952.00	907.05	95.3	70 - 130
D 54 13C8_PFOS	149352	158208			105.9	50 - 150
18 PFOS			928.00	902.79	97.3	70 - 130
17 PFNA			1000.00	978.05	97.8	70 - 130
D 56 13C9_PFNA	662557	729270			110.1	50 - 150
30 9Cl-PF3ONS			932.00	931.93	100	70 - 130
D 55 13C8_PFOSA	313093	352413			112.6	50 - 150
19 PFOSA			1000.00	899.75	90	70 - 130
16 PFNS			960.00	891.65	92.9	70 - 130
D 65 13C2_8:2 FTS_2	110833	121704			109.8	50 - 150
10 PFDA			1000.00	1108.35	110.8	70 - 130
3 8:2 FTS			958.00	832.13	86.9	70 - 130
D 51 13C6_PFDA	663112	669021			100.9	50 - 150
D 58 d3-MeFOSAA	663389	770788			116.2	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	1000.53	100.1	70 - 130
9 PFDS			964.00	980.63	101.7	70 - 130
25 PFUdA			1000.00	958.38	95.8	70 - 130
D 60 d5-EtFOSAA	633381	720483			113.8	50 - 150
D 52 13C7_PFUdA	681974	728866			106.9	50 - 150
5 N-EtFOSAA			1000.00	915.02	91.5	70 - 130
D 61 d7-MeFOSE	103682	111537			107.6	50 - 150
D 57 d3-MeFOSA	48151	61988			128.7	50 - 150
32 MeFOSE			1000.00	947.01	94.7	70 - 130
26 MeFOSA			1000.00	899.20	89.9	70 - 130
31 11Cl-PF3OUDS			942.00	875.79	93	70 - 130
D 62 d9-EtFOSE	112837	125899			111.6	50 - 150
33 EtFOSE			1000.00	978.65	97.9	70 - 130
D 59 d5-EtFOSA	50649	55750			110.1	50 - 150
27 EtFOSA			1000.00	901.31	90.1	70 - 130
11 PFDoA			1000.00	1102.55	110.3	70 - 130
D 38 13C2_PFDoA	687538	715961			104.1	50 - 150
4 10:2 FTS			964.00	906.47	94	70 - 130
34 PFDOS			968.00	934.02	96.5	70 - 130
24 PFTrDA			1000.00	1069.25	106.9	70 - 130
D 42 13C2_PFTeDA	948336	995738			105	50 - 150
23 PFTeDA			1000.00	1019.83	102	70 - 130
35 PFHxDA			1000.00	956.57	95.7	70 - 130
D 40 13C2_PFHxDA	930923	1037028			111.4	50 - 150
36 PFODA			1000.00	959.91	96	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b\082021081.d
Injection Date: 21-Aug-2021 05:54:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 69
Sample Info: ID CCV 1000C_SVLC-1619 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V7 21-Apr-2021 14:28:49
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.712	1.711	1	664725	20	>100:1			1000.00	1105.80	108.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.712	1.711	1/0	697495	19	>100:1			1000.00	997.56		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.088	2.077	1	682445	16	>100:1			1000.00	1098.41	108.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.088	2.088	1/0	720312	15	>100:1			1000.00	983.40		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.141	2.141	1	209015	16	>100:1			1000.00	1107.18	107.9	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.141	2.141	1/0	240476	13	>100:1	Target = 3.41		884.00	883.15		
298.9 > 99	44	2.141	2.141		66007	14	>100:1	3.64 (1.70-5.12)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.478	2.478	1/0	171230	17	>100:1	Target = 2.92		938.00	951.22		
349 > 99	44	2.478	2.478		56364	18	>100:1	3.03 (1.46-4.39)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	1	115295	16	>100:1			5000.00	5553.14	109.2	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.416	2.407	1/0	45781	15	>100:1	Target = 1.58		934.00	936.11		
327 > 81	63	2.407	2.407		26888	16	>100:1	1.70 (0.79-2.37)					
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.443	2.442	1	725960	16	>100:1			1000.00	1099.00	111.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.451	2.442	1/0	769590	17	>100:1	Target = 18.69		1000.00	1046.46		
313 > 119	49	2.451	2.442		41013	16	>100:1	18.76 (9.34-28.04)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.567	2.558	1	1299297	18	>100:1			5000.00	5501.22	106.4	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.567	2.558	1/0	367959	18	>100:1	Target = 0.78		2000.00	2068.43		
285 > 185	66	2.567	2.558		460869	19	>100:1	0.79 (0.39-1.17)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.827	2.818	1	607962	17	>100:1			1000.00	1134.32	106	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.827	2.818	1/0	658385	17	>100:1	Target = 3.75		1000.00	969.71		
363 > 169	47	2.827	2.818		172864	17	>100:1	3.80 (1.87-5.63)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.836	2.836	1	157958	17	>100:1			1000.00	1109.72	107.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.836	2.836	1/0	155634	25	>100:1	Target = 2.79	0.17	910.00	896.89		
399 > 99	45	2.836	2.836		56661	25	>100:1	2.74 (1.39-4.19)	0.13				

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													
377 > 251	45	2.864	2.864	1/0	1041408	17	>100:1	Target = 3.21		942.00	940.28		
377 > 85	45	2.864	2.864		303169	17	>100:1	3.43 (1.60-4.81)					
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.214	3.208	1/0	150800	19	>100:1	Target = 3.03		952.00	907.05		
449 > 99	45	3.214	3.208		54405	20	>100:1	2.77 (1.51-4.54)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.188	3.181	1	104995	21	>100:1			5000.00	5813.99	108.3	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64	3.188	3.174	1/0	47377	20	>100:1	Target = 1.94		948.00	894.51		
427 > 81	64	3.181	3.174		24436	19	>100:1	1.93 (0.97-2.92)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.208	3.201	1	624543	21	>100:1			1000.00	1109.87	110.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.214	3.201	1/0	639654	21	>100:1	Target = 2.91		1000.00	1026.40		
413 > 169	53	3.214	3.201		199910	21	>100:1	3.19 (1.45-4.37)					
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.585	3.577	1	158208	24	>100:1			1000.00	1101.97	105.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.585	3.585	1/0	162838	38	>100:1	Target = 3.38	0.26	928.00	902.79		M
499 > 99	54	3.585	3.585		51505	32	>100:1	3.16 (1.69-5.07)	0.10				M
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.799	3.790	1/0	548945	20	>100:1			932.00	931.93		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.937	3.920	2/1	119234	16	>100:1	Target = 2.80		960.00	891.65		
549 > 99	54	3.937	3.920		43416	15	>100:1	2.74 (1.40-4.19)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.248	4.237	1/0	127725	17	>100:1	Target = 3.15		964.00	980.63		
599 > 99	54	4.248	4.237		46633	14	>100:1	2.73 (1.57-4.73)					
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.406	4.398	1/0	446815	17	>100:1			942.00	875.79		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													
699 > 80	54	4.755	4.742	1/0	106377	19	>100:1	Target = 3.01		968.00	934.02		
699 > 99	54	4.755	4.742		33907	27	>100:1	3.13 (1.50-4.51)					
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.593	3.585	1	729270	19	>100:1			1000.00	1104.21	110.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													
463 > 419	56	3.601	3.585	1/0	763026	19	>100:1	Target = 6.48		1000.00	978.05		
463 > 169	56	3.593	3.585		124069	20	>100:1	6.15 (3.24-9.72)					
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.863	3.863	1	352413	17	>100:1			1000.00	1173.55	112.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													
498 > 78	55	3.863	3.863	1/0	331210	18	>100:1	Target = 32.22		1000.00	899.75		
498>478	55	3.863	3.863		11759	20	>100:1	28.16 (16.11-48.33)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.937	3.928	1	121704	16	>100:1			5000.00	5776.76	109.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													
527 > 507	65	3.937	3.937	1/0	44975	22	>100:1	Target = 1.96		958.00	832.13		
527 > 81	65	3.946	3.937		30964	18	>100:1	1.45 (0.98-2.94)					
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													
627 > 607	65	4.553	4.535	2/1	65031	15		Target = 3.34		964.00	906.47		
627 > 80	65	4.553	4.535		21284	15	>100:1	3.05 (1.67-5.02)					
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.946	3.937	1	669021	18	>100:1			1000.00	1055.64	100.9	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	3.946	3.937	1/0	820924	18	>100:1	Target = 13.93		1000.00	1108.35		
513 > 169	51	3.946	3.937		55846	16	>100:1	14.69 (6.96-20.90)					
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.107	4.098	1	770788	17	>100:1			5000.00	5750.38	116.2	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.107	4.107	1/0	124312	31	>100:1	Target = 1.31	0.08	1000.00	1000.53		M
570 > 483	58	4.116	4.107		94375	31	>100:1	1.31 (0.65-1.97)	0.15				M
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.268	4.257	1	728866	15	>100:1			1000.00	1084.95	106.9	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													
563 > 519	52	4.258	4.257	1/0	630481	16	>100:1	Target = 14.01		1000.00	958.38		
563 > 169	52	4.268	4.257		48080	24	>100:1	13.11 (7.00-21.01)					
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.268	4.257	1	720483	17	>100:1			5000.00	5969.08	113.8	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.268	4.267	1/0	135898	33	>100:1	Target = 1.75		1000.00	915.02		M
584 > 526	60	4.268	4.267		83509	29	>100:1	1.62 (0.87-2.62)	0.19				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.288	4.287	1	111537	12	>100:1			1000.00	1066.18	107.6	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													
616 > 59	61	4.298	4.308	0/-1	119612	14	>100:1			1000.00	947.01		
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.308	4.308	1	61988	13	>100:1			1000.00	1114.77	128.7	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57	4.308	4.318	0/-1	61875	13	>100:1	Target = 1.04		1000.00	899.20		
512 > 219	57	4.308	4.318		68261	13	>100:1	0.90 (0.52-1.56)					
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.455	4.454	1	125899	16	>100:1			1000.00	1056.58	111.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													
630 > 59	62	4.464	4.472	0/-1	113542	16	>100:1			1000.00	978.65		
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.473	4.481	0	55750	16	>100:1			1000.00	1092.83	110.1	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													
526 > 169	59	4.482	4.481	1/1	57868	14	>100:1	Target = 1.05		1000.00	901.31		
526 > 219	59	4.482	4.481		58942	15	>100:1	0.98 (0.52-1.57)					
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.545	4.526	2	715961	16	>100:1			1000.00	1058.95	104.1	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													
613 > 569	38	4.545	4.526	2/0	838485	16	>100:1	Target = 10.52		1000.00	1102.55		
613 > 169	38	4.545	4.526		73736	16	>100:1	11.37 (5.26-15.78)					
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.788	4.769	2/0	693931	20	>100:1	Target = 7.51		1000.00	1069.25		
663 > 169	38	4.788	4.769		88775	20	>100:1	7.81 (3.75-11.27)					
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.010	4.992	2	995738	22	>100:1			1000.00	1055.54	105	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.010	4.998	1/-1	837330	21	>100:1	Target = 11.12		1000.00	1019.83		
713 > 169	42	5.010	4.998		73543	20	>100:1	11.38 (5.56-16.69)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.416	5.390	2	1037028	19	>100:1			1000.00	1123.32	111.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.416	5.390	2/0	703503	19	>100:1	Target = 10.69		1000.00	956.57		
813 > 269	40	5.416	5.390		63631	19	>100:1	11.05 (5.34-16.03)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.810	5.775	3/1	878200	27	75:1	Target = 13.29		1000.00	959.91		
913 > 319	40	5.810	5.775		61409	26	>100:1	14.30 (6.64-19.94)					
*** 37 13C2_PFDA**													
515 > 470		3.946	3.937	1	869936	17	>100:1						
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.451	2.442	1	750008	16	>100:1						
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.208	3.201	1	674408	21	>100:1						

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Drift/ %Rec	Flags
*** 43 13C3_PFBA**													
216 > 172		1.712	1.711	1	653239	20	>100:1						
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.585	3.577	1	158504	18	>100:1						

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

M - Compound Hit/Peak Manually Integrated

Report Date: 05-Aug-2021 13:49:45 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	ICAL 50_SVLC-1596	04-Aug-2021 14:38:11	080421A011.d	ICal					Analytes	L-1	1.00		
2	ICAL 100_SVLC-1597	04-Aug-2021 14:48:42	080421A012.d	ICal					Analytes	L-2	1.00		
3	ICAL 200_SVLC-1598	04-Aug-2021 14:59:14	080421A013.d	ICal					Analytes	L-3	1.00		
4	ICAL 500_SVLC-1599	04-Aug-2021 15:09:48	080421A014.d	ICal					Analytes	L-4	1.00		
5	ICAL 1000_SVLC-1600	04-Aug-2021 15:20:20	080421A015.d	ICal					Analytes	L-5	1.00		
6	ICAL 2000_SVLC-1601	04-Aug-2021 15:30:54	080421A016.d	ICal					Analytes	L-6	1.00		
7	ICAL 5000_SVLC-1602	04-Aug-2021 15:41:27	080421A017.d	ICal					Analytes	L-7	1.00		
8	ICAL 10000_SVLC-1603	04-Aug-2021 15:52:03	080421A018.d	ICal					Analytes	L-8	1.00		
9	ICAL 15000_SVLC-1604	04-Aug-2021 16:02:39	080421A019.d	ICal					Analytes	L-9	1.00		
10	ICAL 20000_SVLC-1605	04-Aug-2021 16:13:16	080421A020.d	ICal					Analytes	L-10	1.00		
100	ID BLK C1	04-Aug-2021 16:23:55	080421A021.d	InstBlk					Surrogates	Smp	0.1100		
11	ICV 500_SVLC-1590	04-Aug-2021 16:34:36	080421A022.d	InstBlk					Surrogates	Smp	0.1100		RR-Misloaded
12	ISOMERS_SVLC-1562	04-Aug-2021 16:45:09	080421A023.d	CheckStd					Surrogates	Smp	1.00	Yes	RR-Misloaded
100	ID BLK C	04-Aug-2021 17:10:50	080421A025.d	InstBlk					Surrogates	Smp	0.1100		
11	ICV 500_SVLC-1590	04-Aug-2021 17:21:32	080421A026.d	ICV					Analytes	ICV	1.00		
12	ISOMERS_SVLC-1562	04-Aug-2021 17:32:04	080421A027.d	CheckStd					Surrogates	Smp	1.00	Yes	
13	ID IBLK A	04-Aug-2021 17:42:36	080421A028.d	InstBlk					Surrogates	Smp	0.1100		
14	WQ10675-002	04-Aug-2021 17:53:09	080421A029.d	LCS		Aqueous	1	10675	Analytes	100x PDS	0.2000		6:2 HIGH-NCM
15	WQ10452-001	04-Aug-2021 18:03:41	080421A030.d	MBlk		Aqueous	1	10452	Surrogates	Smp	0.1100		
16	WG22011-019	04-Aug-2021 18:14:15	080421A031.d	Client	AOPC10-WGC2-10-072121	Aqueous	1	10452	Surrogates	Smp	0.1100		SUR CONFIRMS
17	WG31016-018	04-Aug-2021 18:24:49	080421A032.d	Client	AFFF21-GW29-22-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		
18	WG31016-019	04-Aug-2021 18:35:22	080421A033.d	Client	AFFF21-GW29-15-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		
19	WG31016-020	04-Aug-2021 18:45:56	080421A034.d	Client	AFFF21-GW01-23-073021-00	Aqueous	1	10710	Surrogates	Smp	0.1100		RX-6:2 SUR HIGH CONF-DETECT, SOME LOW-NCM MTX
20	WG31016-021	04-Aug-2021 18:56:33	080421A035.d	Client	AFFF21-GW01-15-073021-00	Aqueous	5	10710	Surrogates	Smp	0.1100		
21	CCV 1000_SVLC-1600	04-Aug-2021 19:07:12	080421A036.d	CCV					Analytes	L-5	1.00		
100	CCB C1	04-Aug-2021 19:17:43	080421A037.d	InstBlk					Surrogates	Smp	0.1100		
22	WQ10798-002	04-Aug-2021 19:28:24	080421A038.d	LCS		Soil	1	10798	Analytes	100x PDS	0.1000		
23	WG31016-010	04-Aug-2021 19:38:56	080421A039.d	Client	AFFF21-SB05-00-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
24	WG31016-011	04-Aug-2021 19:49:31	080421A040.d	Client	AFFF21-SB05-07-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
25	WG31016-011MS	04-Aug-2021 20:00:04	080421A041.d	MS	AFFF21-SB05-07-073021-00	Soil	1	10798	Analytes	100x PDS	0.1000		
26	WG31016-011MD	04-Aug-2021 20:10:40	080421A042.d	MSD	AFFF21-SB05-07-073021-00	Soil	1	10798	Analytes	100x PDS	0.1000		
27	WG31016-012	04-Aug-2021 20:21:13	080421A043.d	Client	AFFF21-SB05-12-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
28	WG31016-013	04-Aug-2021 20:31:49	080421A044.d	Client	AFFF21-SB05-19-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
29	WG31016-014	04-Aug-2021 20:42:24	080421A045.d	Client	AFFF21-SB05-24-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
30	WG31016-015	04-Aug-2021 20:53:00	080421A046.d	Client	AFFF21-SB05-30-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
31	WG31020-016	04-Aug-2021 21:03:38	080421A047.d	Client	AFFF01-SB15-02-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		RR-5X
32	WG31020-017	04-Aug-2021 21:14:12	080421A048.d	Client	AFFF01-SB15-01-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		RR-10X
33	WG31020-018	04-Aug-2021 21:24:45	080421A049.d	Client	AFFF01-SB15-03-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		RR-1X-C/O
34	WG31020-019	04-Aug-2021 21:35:23	080421A050.d	Client	AFFF01-SB15-03-073021-01	Soil	1	10798	Surrogates	Smp	0.1100		
35	CCV 1000A_SVLC-1600	04-Aug-2021 21:45:57	080421A051.d	CCV					Analytes	L-5	1.00		
100	CCB C2	04-Aug-2021 21:56:32	080421A052.d	InstBlk					Surrogates	Smp	0.1100		
36	WG31020-020	04-Aug-2021 22:07:14	080421A053.d	Client	AFFF01-SB09-02-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
37	WG31020-021	04-Aug-2021 22:17:49	080421A054.d	Client	AFFF01-SB09-15-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
38	WG31020-022	04-Aug-2021 22:28:25	080421A055.d	Client	AFFF01-SB09-10-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		

Report Date: 05-Aug-2021 13:49:45 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS01.i\080421A-DOD+ICAL.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
39	WG31020-023	04-Aug-2021 22:39:01	080421A056.d	Client	AFFF01-SB08-02-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
40	WG31020-024	04-Aug-2021 22:49:38	080421A057.d	Client	AFFF01-SB08-10-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
41	WG31020-025	04-Aug-2021 23:00:17	080421A058.d	Client	AFFF01-SB08-24-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
42	WG31020-026	04-Aug-2021 23:10:48	080421A059.d	Client	AFFF01-SB08-24-073021-01	Soil	1	10798	Surrogates	Smp	0.1100		
43	WG31020-027	04-Aug-2021 23:21:22	080421A060.d	Client	AFFF01-SB07-02-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
44	WG31020-028	04-Aug-2021 23:31:57	080421A061.d	Client	AFFF01-SB07-14-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
45	WG31020-029	04-Aug-2021 23:42:30	080421A062.d	Client	AFFF01-SB07-09-073021-00	Soil	1	10798	Surrogates	Smp	0.1100		
46	CCV 1000B_SVLC-1600	04-Aug-2021 23:53:07	080421A063.d	CCV					Analytes	L-5	1.00		
100	CCB C3	05-Aug-2021 00:03:41	080421A064.d	InstBlk					Surrogates	Smp	0.1100		
47	WG28008-004	05-Aug-2021 00:14:22	080421A065.d	Client	ASTC-VAP-13GW(22-25)-(07	Aqueous	1	10675	Surrogates	Smp	0.1100		4:2,8:2,ETAA SUR HI-NCM/ND, 6:2SUR HIGH-DETCT
48	WG28008-004DU	05-Aug-2021 00:24:59	080421A066.d	Client		Aqueous	1	10675	Surrogates	Smp	0.1100		RX/LDUP PASS SURS-NCM
49	WG28008-005	05-Aug-2021 00:35:35	080421A067.d	Client	ASTC-VAP-13GW(32-35)-(07	Aqueous	1	10675	Surrogates	Smp	0.1100		
50	WG28008-005MS	05-Aug-2021 00:46:12	080421A068.d	MS		Aqueous	1	10675	Analytes	100x PDS	0.2000		
54	CCV 1000C_SVLC-1600	05-Aug-2021 01:28:36	080421A072.d	CCV					Analytes	L-5	1.00		
100	CCB C4	05-Aug-2021 01:39:11	080421A073.d	InstBlk					Surrogates	Smp	0.1100		

Report Date: 24-Aug-2021 09:38:32 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L. ICAL 50_SVLC-1596	05-Aug-2021 13:03:58	080521006.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1597	05-Aug-2021 13:14:34	080521007.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1598	05-Aug-2021 13:25:09	080521008.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1599	05-Aug-2021 13:35:48	080521009.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1600	05-Aug-2021 13:46:22	080521010.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1601	05-Aug-2021 13:56:58	080521011.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1602	05-Aug-2021 14:07:33	080521012.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1603	05-Aug-2021 14:18:14	080521013.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1604	05-Aug-2021 14:28:51	080521014.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1605	05-Aug-2021 14:39:31	080521015.d	ICal					Analytes	L-10	1.00		
11	ID IBLK A	05-Aug-2021 14:50:11	080521016.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1590	05-Aug-2021 15:00:44	080521017.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK_SVLC-1562	05-Aug-2021 15:11:18	080521018.d	CheckStd					IsomerCheck	Smp	1.00		
14	ID IBLK B	05-Aug-2021 15:21:52	080521019.d	InstBlk					Surrogates	Smp	0.1100		
15	WQ10751-001	05-Aug-2021 15:32:30	080521020.d	Client		Soil	1	10751	Surrogates	Smp	0.1100		
16	WQ10751-002	05-Aug-2021 15:43:10	080521021.d	LCS		Soil	1	10751	Analytes	100x PDS	0.1000		
17	WQ10751-003	05-Aug-2021 15:53:47	080521022.d	LCSD		Soil	1	10751	Analytes	100x PDS	0.1000		
18	WG26022-001	05-Aug-2021 16:04:23	080521023.d	Client	OK-2	Soil	1	10751	Surrogates	Smp	0.1100		RR-100X
19	WG26022-002	05-Aug-2021 16:15:00	080521024.d	Client	OK-2A	Soil	1	10751	Surrogates	Smp	0.1100		
20	WG26022-003	05-Aug-2021 16:25:41	080521025.d	Client	OK-2B	Soil	1	10751	Surrogates	Smp	0.1100		
21	WG26022-004	05-Aug-2021 16:36:20	080521026.d	Client	OK-2C	Soil	1	10751	Surrogates	Smp	0.1100		
22	WG26023-001	05-Aug-2021 16:46:57	080521027.d	Client	OK-3	Soil	1	10751	Surrogates	Smp	0.1100		RR-100X
23	WG26023-002	05-Aug-2021 16:57:33	080521028.d	Client	OK-3A	Soil	1	10751	Surrogates	Smp	0.1100		
24	WG26023-003	05-Aug-2021 17:08:12	080521029.d	Client	OK-3B	Soil	1	10751	Surrogates	Smp	0.1100		
25	WG26023-004	05-Aug-2021 17:18:48	080521030.d	Client	OK-3C	Soil	1	10751	Surrogates	Smp	0.1100		
26	WG27006-001	05-Aug-2021 17:29:25	080521031.d	Client	FP-16	Soil	1	10751	Surrogates	Smp	0.1100		RR-10X, all sur fail
27	WG27006-002	05-Aug-2021 17:40:02	080521032.d	Client	FP-16A	Soil	1	10751	Surrogates	Smp	0.1100		
28	ID CCV 1000_SVLC-1600	05-Aug-2021 17:50:44	080521033.d	CCV					Analytes	L-5	1.00		
29	CCB 1	05-Aug-2021 18:01:26	080521034.d	InstBlk					Surrogates	Smp	0.1100		
30	WG27006-003	05-Aug-2021 18:12:05	080521035.d	Client	FP-16C	Soil	1	10751	Surrogates	Smp	0.1100		SUR: DoA(low), insuff sample,NCM
31	WG27006-004	05-Aug-2021 18:22:48	080521036.d	Client	FP-16E	Soil	1	10751	Surrogates	Smp	0.1100		
32	WG30020-003	05-Aug-2021 18:33:22	080521037.d	Client	AFFF01-SW04-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		
33	WG30020-002	05-Aug-2021 18:43:57	080521038.d	Client	AFFF01-SW03-072921-00-T2	Aqueous	1	10747	Surrogates	Smp	0.1100		
34	WG30020-002MS	05-Aug-2021 18:54:33	080521039.d	MS		Aqueous	1	10747	Analytes	100x PDS	0.2000		
35	WG24008-001	05-Aug-2021 19:05:12	080521040.d	Client	AOPC20-SW01-EF-072221	Aqueous	1	10417	Surrogates	Smp	0.1100		
36	WG24008-006	05-Aug-2021 19:15:51	080521041.d	Client	AOPC15-SW01-IN-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
37	WG24009-009	05-Aug-2021 19:26:28	080521042.d	Client	AOPC17,21-EXW-4-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
38	WG24009-010	05-Aug-2021 19:37:05	080521043.d	Client	AOPC18-A-072321	Aqueous	1	10417	Surrogates	Smp	0.1100		
39	WG30020-011	05-Aug-2021 19:47:44	080521044.d	Client	AFFF01-SB13-01-072921-00	Soil	5	10645	Surrogates	Smp	0.1100		
40	WG24009-007	05-Aug-2021 19:58:23	080521045.d	Client	AOPC1,6,7-14C60A-072221	Aqueous	5	10417	Surrogates	Smp	0.1100		
41	ID CCV 1000A_SVLC-1600	05-Aug-2021 20:09:03	080521046.d	CCV					Analytes	L-5	1.00		
42	CCB 2	05-Aug-2021 20:19:42	080521047.d	InstBlk					Surrogates	Smp	0.1100		
43	WG24008-002	05-Aug-2021 20:30:19	080521048.d	Client	AOPC13-SW01-IN-072221	Aqueous	50	10417	Surrogates	Smp	0.1100		
44	WG24009-003	05-Aug-2021 20:41:01	080521049.d	Client	AOPC5-14D28A-072221	Aqueous	20	10417	Surrogates	Smp	0.1100		

Report Date: 24-Aug-2021 09:38:32 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\080521-DOD+ICAL.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
45	WG24009-004	05-Aug-2021 20:51:40	080521050.d	Client	AOPC5-14D36A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		
46	WG24009-006	05-Aug-2021 21:02:17	080521051.d	Client	AOPC6-14D02A-072221	Aqueous	100	10417	Surrogates	Smp	0.1100		
50	WG29024-001	05-Aug-2021 21:44:57	080521055.d	Client	PFAS in Soil	Soil	1	10561	Surrogates	Smp	0.1100		
58	ID CCV 1000B_SVLC-1600	05-Aug-2021 23:10:09	080521063.d	CCV					Analytes	L-5	1.00		
59	CCB 3	05-Aug-2021 23:20:49	080521064.d	InstBlk					Surrogates	Smp	0.1100		
60	WQ11064-001	05-Aug-2021 23:31:28	080521065.d	MBlk		Soil	1	11064	Surrogates	Smp	0.1100		
61	WQ11064-002	05-Aug-2021 23:42:07	080521066.d	LCS		Soil	1	11064	Analytes	100x PDS	0.1000		
64	WG29007-011	06-Aug-2021 00:14:04	080521069.d	Client	AFFF21-SB01-00-072821-00	Soil	1	10498	Surrogates	Smp	0.1100		
65	WG31020-011	06-Aug-2021 00:24:41	080521070.d	Client	AFFF01-SB14-02-073021-00	Soil	1	11064	Surrogates	Smp	0.1100		
66	WG31020-012	06-Aug-2021 00:35:19	080521071.d	Client	AFFF01-SB14-07-073021-00	Soil	1	11064	Surrogates	Smp	0.1100		
67	WG31020-013	06-Aug-2021 00:45:58	080521072.d	Client	AFFF01-SB14-16-073021-00	Soil	1	11064	Surrogates	Smp	0.1100		
68	WG31020-014	06-Aug-2021 00:56:43	080521073.d	Client	AFFF01-SB24-01-073021-00	Soil	1	11064	Surrogates	Smp	0.1100		
74	ID CCV 1000_SVLC-1600	06-Aug-2021 02:00:13	080521079.d	CCV					Analytes	L-5	1.00		
75	WH03021-001	06-Aug-2021 02:10:59	080521080.d	Client	AFFF01-SB23-01-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-5X
76	WH03021-001	06-Aug-2021 02:21:39	080521081.d	Client	AFFF01-SB23-01-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
77	WH03022-017	06-Aug-2021 02:32:19	080521082.d	Client	AFFF01-SB20-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
78	WH03022-027	06-Aug-2021 02:42:59	080521083.d	Client	AFFF01-SB03-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-5X
79	WH03022-028	06-Aug-2021 02:53:39	080521084.d	Client	AFFF01-SB03-05-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
80	WH03022-029	06-Aug-2021 03:04:24	080521085.d	Client	AFFF01-SB03-11-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
81	WH03022-018	06-Aug-2021 03:15:04	080521086.d	Client	AFFF01-SB20-12-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
82	WH03022-019	06-Aug-2021 03:25:38	080521087.d	Client	AFFF01-SB20-12-080221-01	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
83	WH03022-020	06-Aug-2021 03:36:09	080521088.d	Client	AFFF01-SB20-16-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
84	WH03022-021	06-Aug-2021 03:46:48	080521089.d	Client	AFFF01-SB21-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
85	WH03022-022	06-Aug-2021 03:57:20	080521090.d	Client	AFFF01-SB21-13-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
86	WH03022-023	06-Aug-2021 04:07:53	080521091.d	Client	AFFF01-SB21-24-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
87	WH03022-024	06-Aug-2021 04:18:28	080521092.d	Client	AFFF01-SB16-02-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
88	WH03022-025	06-Aug-2021 04:29:10	080521093.d	Client	AFFF01-SB16-10-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		RR-1X
89	WH03022-026	06-Aug-2021 04:39:45	080521094.d	Client	AFFF01-SB16-15-080221-00	Soil	50	11064	Surrogates	Smp	0.1100		

Report Date: 15-Aug-2021 15:03:09 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\081421-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID IBLK SVLC-1610	14-Aug-2021 13:11:58	081421005.d	Client		Aqueous	1		Surrogates	Smp	0.1100		
96	ID CCV 100_SVLC-1597	14-Aug-2021 13:22:33	081421006.d	CCV					Analytes	L-2	1.00		
97	ID CCV 200_SVLC-1598	14-Aug-2021 13:33:10	081421007.d	CCV					Analytes	L-3	1.00		
98	ID IBLK B	14-Aug-2021 13:43:45	081421008.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ11942-001	14-Aug-2021 13:54:23	081421009.d	MBlk		Aqueous	1	11942	Surrogates	Smp	0.1100		RR confirms 6:2 detection, RX/NCM affected samples
14	WH07017-009	14-Aug-2021 16:12:31	081421022.d	Client	AFFF21-GW21-16-080621-00	Aqueous	200	11942	Surrogates	Smp	0.1100		
15	WH07017-009MS	14-Aug-2021 16:23:08	081421023.d	MS		Aqueous	200	11942	Analytes	100x PDS	0.2000		
16	WH07017-009MD	14-Aug-2021 16:33:46	081421024.d	MSD		Aqueous	200	11942	Analytes	100x PDS	0.2000		
17	ID CCV 1000_SVLC-1600	14-Aug-2021 16:44:25	081421025.d	CCV					Analytes	L-5	1.00		
18	CCB 1	14-Aug-2021 16:55:01	081421026.d	InstBlk					Surrogates	Smp	0.1100		
19	WH04042-008	14-Aug-2021 17:05:37	081421027.d	Client	AFFF21-GW06-23-080321-00	Aqueous	1	11788	Surrogates	Smp	0.1100		multiple sur failures, CENTRIFUGED, NCM
20	WH04042-008DU	14-Aug-2021 17:16:20	081421028.d	Client		Aqueous	1	11788	Surrogates	Smp	0.1100		multiple sur failures, CENTRIFUGED, NCM
21	WH04042-010	14-Aug-2021 17:27:03	081421029.d	Client	AFFF21-FRB-06-080321-T4	Aqueous	1	11788	Surrogates	Smp	0.1100		6:2 DETECTED, RX
22	WH04042-011	14-Aug-2021 17:37:41	081421030.d	Client	AFFF21-RB-05-080321-T4	Aqueous	1	11788	Surrogates	Smp	0.1100		6:2 DETECTED, RX
23	WH04042-009	14-Aug-2021 17:48:20	081421031.d	Client	AFFF21-GW06-16-080321-00	Aqueous	1	11788	Surrogates	Smp	0.1100		sur: TeDA(low), CENTRIFUGED, NCM
24	WH04042-009MS	14-Aug-2021 17:59:00	081421032.d	MS		Aqueous	1	11788	Analytes	100x PDS	0.2000		sur failures, CENTRIFUGED,NCM
25	WH06049-003	14-Aug-2021 18:09:39	081421033.d	Client	AFFF21-SB11-00-080521-00	Soil	1	11776	Surrogates	Smp	0.1100		
26	WH06049-013	14-Aug-2021 18:20:15	081421034.d	Client	AFFF21-EW01-00-080521-00	Soil	5	11776	Surrogates	Smp	0.1100		
27	WH06049-014	14-Aug-2021 18:30:55	081421035.d	Client	AFFF21-EW01-06-080521-00	Soil	5	11776	Surrogates	Smp	0.1100		
28	WG30060-007	14-Aug-2021 18:41:38	081421036.d	Client	ASTC-VAP-17GW(24-27)-(07	Aqueous	5	11942	Surrogates	Smp	0.1100		
29	WH07017-008	14-Aug-2021 18:52:16	081421037.d	Client	AFFF21-GW21-24-080621-00	Aqueous	5	11942	Surrogates	Smp	0.1100		
30	WG30060-010	14-Aug-2021 19:02:59	081421038.d	Client	ASTC-VAP-17GW(44-47)-(07	Aqueous	20	11942	Surrogates	Smp	0.1100		
31	ID CCV 1000A_SVLC-1600	14-Aug-2021 19:13:39	081421039.d	CCV					Analytes	L-5	1.00		
32	CCB 2	14-Aug-2021 19:24:14	081421040.d	InstBlk					Surrogates	Smp	0.1100		
33	WG31010-001	14-Aug-2021 19:34:50	081421041.d	Client	AOPC2,26-PFAS-C-072921	Aqueous	1	11942	Surrogates	Smp	0.1100		
34	WG31010-002	14-Aug-2021 19:45:26	081421042.d	Client	AOPC1-WU4-25-072921	Aqueous	1	11942	Surrogates	Smp	0.1100		
35	WH11048-001	14-Aug-2021 19:56:05	081421043.d	Client	AFFF21-GW27-22-081021-00	Aqueous	1	11942	Surrogates	Smp	0.1100		
36	WH11048-002	14-Aug-2021 20:06:47	081421044.d	Client	AFFF21-GW27-12-081021-00	Aqueous	1	11942	Surrogates	Smp	0.1100		RR-5X
38	WH04023-001	14-Aug-2021 20:28:06	081421046.d	Client	B-1 (0-2')	Soil	1	11767	Surrogates	Smp	0.1100		
39	WH04023-002	14-Aug-2021 20:38:45	081421047.d	Client	B-1 (2-6')	Soil	1	11767	Surrogates	Smp	0.1100		
40	WH04023-003	14-Aug-2021 20:49:26	081421048.d	Client	B-1 (6-10')	Soil	1	11767	Surrogates	Smp	0.1100		
41	WH04023-004	14-Aug-2021 21:00:08	081421049.d	Client	B-2 (0-2')	Soil	1	11767	Surrogates	Smp	0.1100		
42	WH04023-005	14-Aug-2021 21:10:46	081421050.d	Client	B-2 (2-6')	Soil	1	11767	Surrogates	Smp	0.1100		
43	ID CCV 1000B_SVLC-1600	14-Aug-2021 21:21:24	081421051.d	CCV					Analytes	L-5	1.00		
44	CCB 3	14-Aug-2021 21:32:04	081421052.d	InstBlk					Surrogates	Smp	0.1100		
45	WQ12002-001	14-Aug-2021 21:42:40	081421053.d	MBlk		Aqueous	1	12002	Surrogates	Smp	0.1100		
46	WQ12002-002	14-Aug-2021 21:53:17	081421054.d	LCS		Aqueous	1	12002	Analytes	100x PDS	0.2000		SUR: HxDA(low, non-target), NCM
47	WG30060-008	14-Aug-2021 22:03:55	081421055.d	Client	ASTC-VAP-17GW(34-37)-(07	Aqueous	1	12002	Surrogates	Smp	0.1100		RR-10X
48	WG30060-008MS	14-Aug-2021 22:14:38	081421056.d	MS		Aqueous	1	12002	Analytes	100x PDS	0.2000		
49	WG30060-008MD	14-Aug-2021 22:25:16	081421057.d	MSD		Aqueous	1	12002	Analytes	100x PDS	0.2000		
50	WG31010-003	14-Aug-2021 22:35:54	081421058.d	Client	ERB-02-072921	Aqueous	1	12002	Surrogates	Smp	0.1100		
51	WG31010-004	14-Aug-2021 22:46:35	081421059.d	Client	ERB-03-072921	Aqueous	1	12002	Surrogates	Smp	0.1100		
52	WG31010-006	14-Aug-2021 22:57:15	081421060.d	Client	AOPC2-PFAS-F-072921	Aqueous	1	12002	Surrogates	Smp	0.1100		
53	WG31010-007	14-Aug-2021 23:07:51	081421061.d	Client	AOPC2-PFAS-F-072921-FD	Aqueous	1	12002	Surrogates	Smp	0.1100		

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
54	WG31010-008	14-Aug-2021 23:18:28	081421062.d	Client	FB-16-072921	Aqueous	1	12002	Surrogates	Smp	0.1100		
55	WG31011-001	14-Aug-2021 23:29:08	081421063.d	Client	AOPC2,26-D-072721	Aqueous	1	12002	Surrogates	Smp	0.1100		
56	WG31011-002	14-Aug-2021 23:39:48	081421064.d	Client	AOPC4,11-H-072721	Aqueous	1	12002	Surrogates	Smp	0.1100		
57	WG31011-003	14-Aug-2021 23:50:28	081421065.d	Client	AOPC1,7-UST29-MW02-07272	Aqueous	1	12002	Surrogates	Smp	0.1100		RR-5X
58	WG31011-004	15-Aug-2021 00:01:08	081421066.d	Client	AOPC1,7-W20-01-072721	Aqueous	1	12002	Surrogates	Smp	0.1100		RR-20X, SUR: TeDA(LOW), MATRIX,NCM
59	ID CCV 1000C_SVLC-1600	15-Aug-2021 00:11:47	081421067.d	CCV					Analytes	L-5	1.00		

Report Date: 16-Aug-2021 13:05:17 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\081521-DOD.b

Method: LCMSMS01_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 04-Aug-2021 14:38:11 Cal End Date: 04-Aug-2021 16:13:16

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1597	15-Aug-2021 12:33:49	081521005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1598	15-Aug-2021 12:44:23	081521006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	15-Aug-2021 12:54:55	081521007.d	InstBlk					Surrogates	Smp	0.1100		
26	CCV 1000A_SVLC-1600	15-Aug-2021 18:01:49	081521036.d	CCV					Analytes	L-5	1.00		
100	CCB C2	15-Aug-2021 18:12:23	081521037.d	InstBlk					Surrogates	Smp	0.1100		
31	WQ11853-001	15-Aug-2021 19:16:00	081521043.d	MBlk		Aqueous	1	11853	Surrogates	Smp	0.1100		Confirms 6:2 SUR high
32	WQ11853-002	15-Aug-2021 19:26:33	081521044.d	LCS		Aqueous	1	11853	Analytes	100x PDS	0.2000		
33	WH11046-001	15-Aug-2021 19:37:06	081521045.d	Client	AFFF21-SB23-02-081021-00	Soil	100	11935	Surrogates	Smp	0.1100		
34	WH11046-002	15-Aug-2021 19:47:41	081521046.d	Client	AFFF21-SB23-06-081021-00	Soil	1	11935	Surrogates	Smp	0.1100		8:2 SUR HIGH-NCM/ND, RX-6:2 SUR HIGH IN MB
35	WH04059-002	15-Aug-2021 19:58:15	081521047.d	Client	FT006P-MW304S-00-080321	Aqueous	50	11853	Surrogates	Smp	0.1100		
36	WH04059-003	15-Aug-2021 20:08:49	081521048.d	Client	FT006P-MW304D-00-080321	Aqueous	5	11853	Surrogates	Smp	0.1100		
37	WH04059-005	15-Aug-2021 20:19:24	081521049.d	Client	FT006P-MW303D-00-080421	Aqueous	10	11853	Surrogates	Smp	0.1100		
38	WH04059-006	15-Aug-2021 20:29:59	081521050.d	Client	FT006P-MW303D-01-080421	Aqueous	10	11853	Surrogates	Smp	0.1100		
39	CCV 1000B_SVLC-1600	15-Aug-2021 20:40:35	081521051.d	CCV					Analytes	L-5	1.00		
100	CCB C3	15-Aug-2021 20:51:12	081521052.d	InstBlk					Surrogates	Smp	0.1100		
40	WH04059-007	15-Aug-2021 21:01:53	081521053.d	Client	FT006P-MW303S-00-080421	Aqueous	10	11853	Surrogates	Smp	0.1100		
41	WQ12136-001	15-Aug-2021 21:12:32	081521054.d	MBlk		Aqueous	1	12136	Surrogates	Smp	0.1100		
42	WQ12136-002	15-Aug-2021 21:23:04	081521055.d	LCS		Aqueous	1	12136	Analytes	100x PDS	0.2000		
43	WG31011-008	15-Aug-2021 21:33:38	081521056.d	Client	AOPC10-WGC2-11-072821	Aqueous	1	12136	Surrogates	Smp	0.1100		4:2 SUR HIGH-NCM/ND
44	WG31011-008MS	15-Aug-2021 21:44:13	081521057.d	MS		Aqueous	1	12136	Analytes	100x PDS	0.2000		
45	WG31011-009	15-Aug-2021 21:54:47	081521058.d	Client	AOPC9-W2-12-072821	Aqueous	1	12136	Surrogates	Smp	0.1100		4:2 SUR HIGH-NCM/ND
46	WG31011-009DU	15-Aug-2021 22:05:24	081521059.d	Client		Aqueous	1	12136	Surrogates	Smp	0.1100		
47	WG31011-010	15-Aug-2021 22:15:58	081521060.d	Client	FB-15-072821	Aqueous	1	12136	Surrogates	Smp	0.1100		
48	WH06025-001	15-Aug-2021 22:26:36	081521061.d	Client	AFFF21-GW08-23-080421-00	Aqueous	1	12136	Surrogates	Smp	0.1100		TeDA SUR LOW-NCM/MTX
49	WH06025-002	15-Aug-2021 22:37:12	081521062.d	Client	AFFF21-GW08-15-080421-00	Aqueous	1	12136	Surrogates	Smp	0.1100		SURS-NCM/MTX
50	WH06025-008	15-Aug-2021 22:47:49	081521063.d	Client	AFFF21-GW10-23-080421-00	Aqueous	1	12136	Surrogates	Smp	0.1100		4:2 SUR HIGH-NCM/ND, SURS LOW-NCM/MTX
51	WH06025-009	15-Aug-2021 22:58:28	081521064.d	Client	AFFF21-GW10-14-080421-00	Aqueous	1	12136	Surrogates	Smp	0.1100		SURS-NCM/MTX
52	WH06025-010	15-Aug-2021 23:09:03	081521065.d	Client	AFFF21-FRB-07-080421-T4	Aqueous	1	12136	Surrogates	Smp	0.1100		6:2 SUR HIGH-NCM/ND
53	CCV 1000C_SVLC-1600	15-Aug-2021 23:19:38	081521066.d	CCV					Analytes	L-5	1.00		
100	CCB C4	15-Aug-2021 23:30:14	081521067.d	InstBlk					Surrogates	Smp	0.1100		
54	WH05047-001	15-Aug-2021 23:40:56	081521068.d	Client	FT006P-FRB-080521	Aqueous	1	12136	Surrogates	Smp	0.1100		
55	WH05047-002	15-Aug-2021 23:51:31	081521069.d	Client	FT006P-MW301D-00-080521	Aqueous	1	12136	Surrogates	Smp	0.1100		
56	WH05047-003	16-Aug-2021 00:02:08	081521070.d	Client	FT006P-MW301S-00-080521	Aqueous	1	12136	Surrogates	Smp	0.1100		RR-5X
57	WH05047-004	16-Aug-2021 00:12:46	081521071.d	Client	FT006P-FT3MW5-00-080521	Aqueous	1	12136	Surrogates	Smp	0.1100		RR-200X, SURS-NCM/MTX
58	WH05047-005	16-Aug-2021 00:23:25	081521072.d	Client	FT006P-MW302D-00-080521	Aqueous	1	12136	Surrogates	Smp	0.1100		RR-1X-C/O
59	CCV 1000D_SVLC-1600	16-Aug-2021 00:34:01	081521073.d	CCV					Analytes	L-5	1.00		
100	ID BLK B10	16-Aug-2021 03:45:56	081521091.d	InstBlk					Surrogates	Smp	0.1100		

Report Date: 17-Aug-2021 18:17:30 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\081621-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 05-Aug-2021 13:03:58 Cal End Date: 05-Aug-2021 14:39:31

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1597	16-Aug-2021 13:03:50	081621005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1598	16-Aug-2021 13:14:27	081621006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	16-Aug-2021 13:25:00	081621007.d	InstBlk					Surrogates	Smp	0.1100		
4	WG31011-003	16-Aug-2021 14:08:08	081621012.d	Client	AOPC1,7-UST29-MW02-07272	Aqueous	5	12002	Surrogates	Smp	0.1100		
5	WG30060-006	16-Aug-2021 14:18:44	081621013.d	Client	ASTC-VAP-17GW(13-16)-(07	Aqueous	5	11942	Surrogates	Smp	0.1100		
6	WG30060-007	16-Aug-2021 14:29:20	081621014.d	Client	ASTC-VAP-17GW(24-27)-(07	Aqueous	5	11942	Surrogates	Smp	0.1100		
7	WH11048-002	16-Aug-2021 14:39:56	081621015.d	Client	AFFF21-GW27-12-081021-00	Aqueous	5	11942	Surrogates	Smp	0.1100		
8	WG30060-008	16-Aug-2021 14:50:37	081621016.d	Client	ASTC-VAP-17GW(34-37)-(07	Aqueous	10	12002	Surrogates	Smp	0.1100		
9	WG30060-011	16-Aug-2021 15:01:15	081621017.d	Client	ASTC-VAP-17GW(57-60)-(07	Aqueous	20	11942	Surrogates	Smp	0.1100		NOT NEEDED
10	WG31011-004	16-Aug-2021 15:11:55	081621018.d	Client	AOPC1,7-W20-01-072721	Aqueous	20	12002	Surrogates	Smp	0.1100		
11	ID CCV 1000_SVLC-1600	16-Aug-2021 15:22:35	081621019.d	CCV					Analytes	L-5	1.00		
12	CCB 1	16-Aug-2021 15:33:10	081621020.d	InstBlk					Surrogates	Smp	0.1100		
23	ID CCV 1000A_SVLC-1600	16-Aug-2021 17:30:02	081621031.d	CCV					Analytes	L-5	1.00		
24	CCB 2	16-Aug-2021 17:40:45	081621032.d	InstBlk					Surrogates	Smp	0.1100		
25	WQ12076-001	16-Aug-2021 17:51:20	081621033.d	MBlk		Aqueous	1	12076	Surrogates	Smp	0.1100		6:2 @ 205.16ng/L on column (9.0178ng/L)
26	WQ12076-002	16-Aug-2021 18:01:57	081621034.d	LCS		Aqueous	1	12076	Analytes	100x PDS	0.2000		
27	WH03023-010	16-Aug-2021 18:12:35	081621035.d	Client	AFFF21-RB-03-080221-T3	Aqueous	1	12076	Surrogates	Smp	0.1100		6:2(detected), insuff sample, NCM
28	WH03024-009	16-Aug-2021 18:23:19	081621036.d	Client	AFFF21-GW30-24-080221-00	Aqueous	1	12076	Surrogates	Smp	0.1100		report run 1, batch compromised
29	WH03024-010	16-Aug-2021 18:33:56	081621037.d	Client	AFFF21-GW30-15-080221-00	Aqueous	1	12076	Surrogates	Smp	0.1100		not reported to client, batch compromised,NCM
30	WH03051-001	16-Aug-2021 18:44:34	081621038.d	Client	Shaw-Source-009	Aqueous	1	12076	Surrogates	Smp	0.1100		MeFOSA only,results similar to run 1,MFOSA passes
31	WG31010-005	16-Aug-2021 18:55:16	081621039.d	Client	AOPC2-PFAS-E-072921	Aqueous	1	12076	Surrogates	Smp	0.1100		RR-1X, SUR: 4:2(ND),6:2(DETECT), RX
32	WG31010-005MS	16-Aug-2021 19:05:54	081621040.d	MS		Aqueous	1	12076	Analytes	100x PDS	0.2000		RX
33	WG31010-005MD	16-Aug-2021 19:16:29	081621041.d	MSD		Aqueous	1	12076	Analytes	100x PDS	0.2000		RX
34	WG31011-005	16-Aug-2021 19:27:06	081621042.d	Client	FB-14-072721	Aqueous	1	12076	Surrogates	Smp	0.1100		RX, COMPROMISED BATCH
35	WG31011-006	16-Aug-2021 19:37:44	081621043.d	Client	AOPC2-PFAS-G-072821	Aqueous	1	12076	Surrogates	Smp	0.1100		RX, COMPROMISED BATCH
36	WG31011-007	16-Aug-2021 19:48:24	081621044.d	Client	AOPC21-WSW-5-072821	Aqueous	1	12076	Surrogates	Smp	0.1100		RX, COMPROMISED BATCH
37	ID CCV 1000B_SVLC-1600	16-Aug-2021 19:59:02	081621045.d	CCV					Analytes	L-5	1.00		

Report Date: 21-Aug-2021 12:36:25 AIM Revision: 2.0 19-Apr-2021 11:30:40

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V7 21-Apr-2021 14:28:49

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 20-Aug-2021 17:50:13 Cal End Date: 20-Aug-2021 19:25:46

Method Lock: Unlocked Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L. ICAL 50_SVLC-1596	20-Aug-2021 17:50:13	082021013.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1597	20-Aug-2021 18:00:51	082021014.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1598	20-Aug-2021 18:11:26	082021015.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1599	20-Aug-2021 18:22:05	082021016.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1619	20-Aug-2021 18:32:39	082021017.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1601	20-Aug-2021 18:43:14	082021018.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1602	20-Aug-2021 18:53:48	082021019.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1603	20-Aug-2021 19:04:29	082021020.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1604	20-Aug-2021 19:15:07	082021021.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1605	20-Aug-2021 19:25:46	082021022.d	ICal					Analytes	L-10	1.00		
11	ID IBLK	20-Aug-2021 19:36:27	082021023.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1618	20-Aug-2021 19:47:02	082021024.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK STD_SVLC-1442	20-Aug-2021 19:57:36	082021025.d	CheckStd					IsomerCheck	Smp	1.00		
14	ID IBLK A	20-Aug-2021 20:08:11	082021026.d	InstBlk					Surrogates	Smp	0.1100		
15	WQ12325-001	20-Aug-2021 20:18:47	082021027.d	MBlk		Aqueous	1	12325	Surrogates	Smp	0.1100		
16	WQ12325-002	20-Aug-2021 20:29:23	082021028.d	LCS		Aqueous	1	12325	Analytes	100x PDS	0.2000		
17	WQ12470-001	20-Aug-2021 20:40:00	082021029.d	MBlk		Aqueous	1	12470	Surrogates	Smp	0.1100		
18	WQ12470-002	20-Aug-2021 20:50:35	082021030.d	LCS		Aqueous	1	12470	Analytes	100x PDS	0.2000		
24	WH06049-011	20-Aug-2021 21:54:26	082021036.d	Client	AFFF21-FRB-06-080521-T3	Aqueous	1	12470	Surrogates	Smp	0.1100		
25	WH06049-012	20-Aug-2021 22:05:02	082021037.d	Client	AFFF21-RB-06-080521-T3	Aqueous	1	12470	Surrogates	Smp	0.1100		
26	WH06035-001	20-Aug-2021 22:15:39	082021038.d	Client	AFFF21-GAC-01-080421-T3	Aqueous	1	12325	Surrogates	Smp	0.1100		
27	WH06035-001MS	20-Aug-2021 22:26:16	082021039.d	MS		Aqueous	1	12325	Analytes	100x PDS	0.2000		
28	WH04059-005	20-Aug-2021 22:36:56	082021040.d	Client	FT006P-MW303D-00-080421	Aqueous	10	12325	Surrogates	Smp	0.1100		
29	WH04059-006	20-Aug-2021 22:47:34	082021041.d	Client	FT006P-MW303D-01-080421	Aqueous	10	12325	Surrogates	Smp	0.1100		
30	ID CCV 1000_SVLC-1619	20-Aug-2021 22:58:13	082021042.d	CCV					Analytes	L-5	1.00		
31	CCB 1	20-Aug-2021 23:08:55	082021043.d	InstBlk					Surrogates	Smp	0.1100		
32	WH06049-001	20-Aug-2021 23:19:33	082021044.d	Client	AFFF21-GW11-23-080521-00	Aqueous	1	12325	Surrogates	Smp	0.1100		sur: TeDA(low),centrifuged,NCM
33	WH06049-002	20-Aug-2021 23:30:07	082021045.d	Client	AFFF21-GW11-15-080521-00	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: TeDA(low),centrifuged,NCM
34	WH06029-001	20-Aug-2021 23:40:44	082021046.d	Client	Pool#1@LiftSta	Aqueous	1	12325	Surrogates	Smp	0.1100		MULTIPLE SUR FAILURES, CENTRIFUGED,NCM
35	WH06030-001	20-Aug-2021 23:51:22	082021047.d	Client	Pool#1@LiftSta-002	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(DETECT),TeDA(low), insuff sample,NCM
36	WH06049-009	21-Aug-2021 00:02:00	082021048.d	Client	AFFF21-FRB-08-080521-T4	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
37	WH06049-010	21-Aug-2021 00:12:37	082021049.d	Client	AFFF21-RB-07-080521-T4	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
38	WH10009-005	21-Aug-2021 00:23:13	082021050.d	Client	AFFF21-RB-09-081021-T3	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
39	WH10009-006	21-Aug-2021 00:33:50	082021051.d	Client	AFFF21-FRB-09-081021-T4	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
40	WH04047-015	21-Aug-2021 00:44:32	082021052.d	Client	AFFF01-FRB-04-080321-T2	Aqueous	1	12325	Surrogates	Smp	0.1100		
41	WH04047-016	21-Aug-2021 00:55:13	082021053.d	Client	AFFF01-FRB-04-080321-T1	Aqueous	1	12325	Surrogates	Smp	0.1100		
42	ID CCV 1000A_SVLC-1619	21-Aug-2021 01:05:54	082021054.d	CCV					Analytes	L-5	1.00		
43	CCB 2	21-Aug-2021 01:17:14	082021055.d	InstBlk					Surrogates	Smp	0.1100		
44	WQ12375-001	21-Aug-2021 01:27:56	082021056.d	MBlk		Soil	1	12375	Surrogates	Smp	0.1100		
45	WQ12375-002	21-Aug-2021 01:38:34	082021057.d	LCS		Soil	1	12375	Analytes	100x PDS	0.1000		
46	WH04040-006	21-Aug-2021 01:49:12	082021058.d	Client	AFFF21-FRB-04-080321-T3	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
47	WH04040-007	21-Aug-2021 01:59:51	082021059.d	Client	AFFF21-RB-04-080321-T3	Aqueous	1	12325	Surrogates	Smp	0.1100		SUR: 6:2(ND),NCM
48	WH06027-012	21-Aug-2021 02:10:33	082021060.d	Client	AFFF01-GW06-24-080421-00	Aqueous	5	12196	Surrogates	Smp	0.1100		
49	WH06027-014	21-Aug-2021 02:21:13	082021061.d	Client	AFFF01-GW05-26-080521-00	Aqueous	5	12196	Surrogates	Smp	0.1100		

Report Date: 21-Aug-2021 12:36:25 AIM Revision: 2.0 19-Apr-2021 11:30:40

Batch Path: \\Organics\LL\LCMSMS02.i\082021-DOD+ICAL.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
50	WH05009-005	21-Aug-2021 02:31:53	082021062.d	Client	RSA-FFS-SO-2-080321	Soil	1	12375	Surrogates	Smp	0.1100		
51	WH05009-006	21-Aug-2021 02:42:32	082021063.d	Client	RSA-FFS-2-SO-080321	Soil	1	12375	Surrogates	Smp	0.1100		
52	WH05009-008	21-Aug-2021 02:53:07	082021064.d	Client	RSA-STP4-SO-2-080321	Soil	1	12375	Surrogates	Smp	0.1100		
53	WH05009-009	21-Aug-2021 03:03:42	082021065.d	Client	RSA-FD-04-SO-080321	Soil	1	12375	Surrogates	Smp	0.1100		
54	WH05009-011	21-Aug-2021 03:14:18	082021066.d	Client	RSA-STP4-SO-1-080321	Soil	1	12375	Surrogates	Smp	0.1100		
55	WH05009-012	21-Aug-2021 03:24:57	082021067.d	Client	RSA-STP1-SO-1-080321	Soil	1	12375	Surrogates	Smp	0.1100		
56	ID CCV 1000B_SVLC-1619	21-Aug-2021 03:35:40	082021068.d	CCV					Analytes	L-5	1.00		
57	CCB 3	21-Aug-2021 03:46:20	082021069.d	InstBlk					Surrogates	Smp	0.1100		
58	WH05009-013	21-Aug-2021 03:57:01	082021070.d	Client	RSA-STP1-SO-2-080321	Soil	5	12375	Surrogates	Smp	0.1100		
59	WH05009-014	21-Aug-2021 04:07:42	082021071.d	Client	RSA-STP3-SO-2-080321	Soil	1	12375	Surrogates	Smp	0.1100		SUR: PFDA(LOW, CONFIRMED BY MS/D),NCM
60	WH05009-014MS	21-Aug-2021 04:18:23	082021072.d	MS		Soil	1	12375	Analytes	100x PDS	0.1000		
61	WH05009-014MD	21-Aug-2021 04:29:03	082021073.d	MSD		Soil	1	12375	Analytes	100x PDS	0.1000		
62	WG31010-005	21-Aug-2021 04:39:42	082021074.d	Client	AOPC2-PFAS-E-072921	Aqueous	1	12470	Surrogates	Smp	0.1100		
63	WG31010-005MS	21-Aug-2021 04:50:21	082021075.d	MS		Aqueous	1	12470	Analytes	100x PDS	0.2000		
64	WG31010-005MD	21-Aug-2021 05:01:01	082021076.d	MSD		Aqueous	1	12470	Analytes	100x PDS	0.2000		
65	WG31011-005	21-Aug-2021 05:11:39	082021077.d	Client	FB-14-072721	Aqueous	1	12470	Surrogates	Smp	0.1100		
66	WG31011-006	21-Aug-2021 05:22:20	082021078.d	Client	AOPC2-PFAS-G-072821	Aqueous	1	12470	Surrogates	Smp	0.1100		
67	WG31011-007	21-Aug-2021 05:33:02	082021079.d	Client	AOPC21-WSW-5-072821	Aqueous	1	12470	Surrogates	Smp	0.1100		SUR: 6:2(DETECT), CONFIRMS,RPT RUN 1, NCM
69	ID CCV 1000C_SVLC-1619	21-Aug-2021 05:54:26	082021081.d	CCV					Analytes	L-5	1.00		

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **D. WILSON** **DATE:** **OCTOBER 8, 2021**

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

SUBJECT: **ORGANIC DATA VALIDATION – POLYFLUOROALKYL SUBSTANCES (PFAS)**
NASA-AMES
SAMPLE DELIVERY GROUP (SDG) WH19014

SAMPLES: 2/Aqueous

AOPC14-SW01-EF-081821 AOPC14-SW01-IN-081821

Overview

The sample set for NASA-Ames, SDG WH19014, consisted of two (2) aqueous samples. All samples were analyzed for polyfluoroalkyl substances (PFAS).

The samples were collected by Tetra Tech, Inc. on August 18, 2021 and analyzed by Pace Analytical Services. All analyses were conducted in accordance with Department of Defense ((DOD)/Department of Energy (DOE) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3, PFAS using LC/MS/MS Appendix B Table B-15 (2019). The data contained in this SDG was validated via EPA Stage 4 with regard to the following parameters:

*	• Data completeness
	• Hold times/Sample Preservation
*	• Mass Calibration
*	• LC/MS/MS System Tuning and Performance
*	• Mass Spectral Acquisition Rate
*	• Instrument Sensitivity Check
*	• Ion Transition Check
*	• Ion Ratios
*	• Initial/Continuing Calibrations
	• Laboratory Instrument / Preparation / Field Blank Results
	• Extraction Internal Standard Recoveries
*	• Laboratory Control Sample Results
*	• Compound Identification
*	• Compound Quantitation
*	• Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, and documentation supporting these findings is presented in Appendix C.

PFAS

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

The fourteen day sample collection to preparation was exceeded by eleven days for samples AOPC14-SW01-EF-081821 and AOPC14-SW01-IN-081821. The detected and nondetected results reported in the affected samples were qualified as estimated (J) and (UJ), respectively.

The extracted internal standard recovery for 13C2-6:2FTS was above the quality control limit for sample AOPC14-SW01-IN-081821. The laboratory re-prepared the sample fourteen days past the fourteen day extraction hold time and the extracted internal standard recovery for 13C2-6:2FTS was above the quality control limit. The original analysis was used for validation. The detected result reported for 6:2 fluorotelomer sulfonate (6:2FTS) was qualified as estimated (J).

Additional Comments

Non-detected results were reported to the limit of detection (LOD).

Instances of manual integrations were present in this data package. All manual integrations were documented by the laboratory and are noted in the raw data of the original data package.

A detected result for PFOS (1.5 ng/L) was present in the method blank. All samples were affected. No validation actions were required as all affected results were reported at least five times above the blank result.

The extracted internal standard recovery for 13C2-6:2FTS was above the quality control limits for sample AOPC14-SW01-EF-081821. No validation action was required as the result reported for 6:2FTS in the affected sample was nondetected.

Executive Summary

Laboratory Performance Issues: The samples were extracted outside of the fourteen day hold time. Two extracted internal standard recoveries were outside the quality control limits.

Other Factors Affecting Data Quality: Detected results below the LOQ were estimated..

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled “Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis be QSM Table B15” (May 1, 2020). The text of this report has been formulated to address only those areas affecting data quality.

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

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

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

Data Qualifier Definitions

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

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

Appendix A

Qualified Analytical Results

Qualifier Codes:

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

PROJ_NO: 09033A	NSAMPLE	AOPC14-SW01-EF-081821			AOPC14-SW01-IN-081821		
SDG: WH19014	LAB_ID	WH19014-001			WH19014-002		
FRACTION: PFAS	SAMP_DATE	8/18/2021			8/18/2021		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		4.1	UJ	H	4	UJ	H
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		4.1	UJ	H	4	UJ	H
4:2 FLUOROTELOMER SULFONATE		4.1	UJ	H	4	UJ	H
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		4.1	UJ	H	2.7	J	HNP
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		4.1	UJ	H	4	UJ	H
9CL-PF3ONS		4.1	UJ	H	4	UJ	H
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		4.1	UJ	H	4	UJ	H
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		4.1	UJ	H	4	UJ	H
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		4.1	UJ	H	4	UJ	H
PENTADECAFLUOROOCTANOIC ACID (PFOA)		13	J	H	14	J	H
PERFLUOROBUTANESULFONIC ACID (PFBS)		24	J	H	26	J	H
PERFLUOROBUTANOIC ACID (PFBA)		10	J	H	8.2	J	H
PERFLUORODECANESULFONIC ACID (PFDS)		2.1	UJ	H	2	UJ	H
PERFLUORODECANOIC ACID (PFDA)		2.1	UJ	H	2	UJ	H
PERFLUORODODECANOIC ACID (PFDOA)		2.1	UJ	H	2	UJ	H
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		4.9	J	H	6.5	J	H
PERFLUOROHEPTANOIC ACID (PFHPA)		4.5	J	H	5.7	J	H
PERFLUOROHEXANESULFONIC ACID (PFHXS)		100	J	H	130	J	H
PERFLUOROHEXANOIC ACID (PFHXA)		22	J	H	27	J	H
PERFLUORONONANESULFONIC ACID (PFNS)		2.1	UJ	H	2	UJ	H
PERFLUORONONANOIC ACID (PFNA)		2.1	UJ	H	2	UJ	H
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2.1	UJ	H	2	UJ	H
PERFLUOROOCTANESULFONIC ACID (PFOS)		94	J	H	120	J	H
PERFLUOROPENTANESULFONIC ACID (PFPES)		20	J	H	21	J	H

PROJ_NO: 09033A	NSAMPLE	AOPC14-SW01-EF-081821			AOPC14-SW01-IN-081821		
SDG: WH19014	LAB_ID	WH19014-001			WH19014-002		
FRACTION: PFAS	SAMP_DATE	8/18/2021			8/18/2021		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROPENTANOIC ACID (PFPEA)		9.6	J	H	8.8	J	H
PERFLUOROTETRADECANOIC ACID (PFTEA)		2.1	UJ	H	2	UJ	H
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2.1	UJ	H	2	UJ	H
PERFLUOROUNDECANOIC ACID (PFUNA)		2.1	UJ	H	2	UJ	H

Appendix B

Results as Reported by the Laboratory

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH19014-001
Description: AOPC14-SW01-EF-081821
Matrix: Aqueous
Date Sampled: 08/18/2021 1330
Project Name: NASA Ames PFAS
Date Received: 08/19/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/15/2021 1914	MMM	09/12/2021 1358	15107

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.1	UQ	8.2	4.1	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.1	U	8.2	4.1	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	24		4.1	2.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	4.9		4.1	2.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	20		4.1	2.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	100		4.1	2.1	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	10		4.1	2.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	4.5		4.1	2.1	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	22		4.1	2.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	13		4.1	2.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	9.6		4.1	2.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	94	B	4.1	2.1	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		132	50-150
13C2_6:2FTS	N	240	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		103	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		115	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		92	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH19014-001
Description: AOPC14-SW01-EF-081821
Matrix: Aqueous
Date Sampled: 08/18/2021 1330
Project Name: NASA Ames PFAS
Date Received: 08/19/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		105	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH19014-002
Description: AOPC14-SW01-IN-081821
Matrix: Aqueous
Date Sampled: 08/18/2021 1340
Project Name: NASA Ames PFAS
Date Received: 08/19/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/15/2021 1924	MMM	09/12/2021 1358	15107
2	SOP SPE	PFAS by ID SOP QSM B-15	1	09/19/2021 1754	JJG	09/17/2021 1758	15718

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.7	JQ	7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	26		4.0	2.0	0.99	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	6.5		4.0	2.0	0.99	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	21		4.0	2.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	130		4.0	2.0	0.99	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	8.2		4.0	2.0	0.99	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	5.7		4.0	2.0	0.99	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	27		4.0	2.0	0.99	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	14		4.0	2.0	0.99	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	8.8		4.0	2.0	0.99	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	120	B	4.0	2.0	0.99	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		115	50-150	H	115	50-150
13C2_6:2FTS	N	271	50-150	HN	155	50-150
13C2_8:2FTS		105	50-150	H	101	50-150
13C2_PFDoA		92	50-150	H	97	50-150
13C2_PFTeDA		106	50-150	H	101	50-150
13C3_PFBS		110	50-150	H	111	50-150
13C3_PFHxS		96	50-150	H	104	50-150
13C3-HFPO-DA		113	50-150	H	109	50-150
13C4_PFBA		106	50-150	H	110	50-150
13C4_PFHpA		108	50-150	H	107	50-150
13C5_PFHxA		96	50-150	H	110	50-150
13C5_PFPeA		107	50-150	H	107	50-150
13C6_PFDA		97	50-150	H	101	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH19014-002
Description: AOPC14-SW01-IN-081821
Matrix: Aqueous
Date Sampled: 08/18/2021 1340
Project Name: NASA Ames PFAS
Date Received: 08/19/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		97	50-150	H	115	50-150
13C8_PFOA		112	50-150	H	120	50-150
13C8_PFOS		89	50-150	H	97	50-150
13C8_PFOSA		92	50-150	H	112	50-150
13C9_PFNA		99	50-150	H	111	50-150
d5-EtFOSAA		106	50-150	H	110	50-150
d3-MeFOSAA		107	50-150	H	108	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH19014-002
Description: AOPC14-SW01-IN-081821
Matrix: Aqueous
Date Sampled: 08/18/2021 1340
Project Name: NASA Ames PFAS
Date Received: 08/19/2021
Project Number: 103IG667601

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/15/2021 1924	MMM	09/12/2021 1358	15107
2	SOP SPE	PFAS by ID SOP QSM B-15	1	09/19/2021 1754	JJG	09/17/2021 1758	15718

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	2.2	HJQ	8.3	4.2	2.1	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	UH	8.3	4.2	2.1	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	28	H	4.1	2.1	1.0	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	8.0	H	4.1	2.1	1.0	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	24	H	4.1	2.1	1.0	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	140	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	8.0	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	6.0	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	27	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	16	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	10	H	4.1	2.1	1.0	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	UH	4.1	2.1	1.0	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	120	H	4.1	2.1	1.0	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		115	50-150	H	115	50-150
13C2_6:2FTS	N	271	50-150	HN	155	50-150
13C2_8:2FTS		105	50-150	H	101	50-150
13C2_PFDoA		92	50-150	H	97	50-150
13C2_PFTeDA		106	50-150	H	101	50-150
13C3_PFBS		110	50-150	H	111	50-150
13C3_PFHxS		96	50-150	H	104	50-150
13C3-HFPO-DA		113	50-150	H	109	50-150
13C4_PFBA		106	50-150	H	110	50-150
13C4_PFHpA		108	50-150	H	107	50-150
13C5_PFHxA		96	50-150	H	110	50-150
13C5_PFPeA		107	50-150	H	107	50-150
13C6_PFDA		97	50-150	H	101	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: WH19014-002
Description: AOPC14-SW01-IN-081821
Matrix: Aqueous
Date Sampled: 08/18/2021 1340
Project Name: NASA Ames PFAS
Date Received: 08/19/2021
Project Number: 103IG667601

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		97	50-150	H	115	50-150
13C8_PFOA		112	50-150	H	120	50-150
13C8_PFOS		89	50-150	H	97	50-150
13C8_PFOSA		92	50-150	H	112	50-150
13C9_PFNA		99	50-150	H	111	50-150
d5-EtFOSAA		106	50-150	H	110	50-150
d3-MeFOSAA		107	50-150	H	108	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

Appendix C

Support Documentation

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 124295

Client: Tetra Tech	Report to Contact: Mike Dahlquist	Telephone No. / E-mail: (510)302-6310/ Mike.Dahlquist@tetratech.com	Quote No.
Address: 1999 Harrison St.	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Oakland State: CA Zip Code: 94612	Printed Name: Callie Neaves		WH19014
Project Name: NASA Ames PFAS			KES2
Project No.: 103IG667601	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	6-Grab Or Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	HCl	HNO3	H2O	NaOH	Solid H2	Field Filtered	PFAS (QSM 8-15)	Remarks / Cooler I.D.
AOPC14-SW01-EF-081821	8/18/21	1330	G	x			2							x	
AOPC14-SW01-IN-081821	8/18/21	1340	G	x			2							x	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)	Sample Disposal ☐ Return to Client ☐ Disposal by Lab	Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)
1. Relinquished by: Callie Neaves TE [signature]	Date: 8/18/21 Time: 1430	1. Received by	Date / Time
2. Relinquished by	Date / Time	2. Received by	Date / Time
3. Relinquished by	Date / Time	3. Received by	Date / Time
4. Relinquished by: Fedex	Date: 8/19/21 Time: 0930	4. Laboratory received by: [signature]	Date: 8/19/21 Time: 0930

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 3.4 °C
Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Sample Summary
Tetra Tech
Lot Number: WH19014
Project Name: NASA Ames PFAS
Project Number: 103IG667601

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	AOPC14-SW01-EF-081821	Aqueous	08/18/2021 1330	08/19/2021
002	AOPC14-SW01-IN-081821	Aqueous	08/18/2021 1340	08/19/2021

(2 samples)

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

The continuing calibration verification (CCV) associated with samples WH19014-001, WH19014-002 was outside of criteria for the following analytes: 4:2 and 6:2FTS surrogates/EIS recovered high. Associated target analytes recovered within limits The data has been reported.

Surrogate recovery for the following sample was outside the upper control limit: WH19014-001. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: WH19014-002. Re-extraction and/or re-analysis was performed with concurring results outside of holding time. Both sets of data have been reported.

The method blank associated with batch 15107 had PFOS detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for PFOS have been flagged with a "B".

PFAS by LC/MS/MS - MB

Sample ID: WQ15107-001
Batch: 15107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/12/2021 1358

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/13/2021 2028
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	09/13/2021 2028
PFOS	1.5	J	1	4.0	2.0	1.0	ng/L	09/13/2021 2028

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		114	50-150
13C2_6:2FTS		120	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		102	50-150
13C3-HFPO-DA		113	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		110	50-150
13C5_PFPeA		111	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ15107-001
Batch: 15107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/12/2021 1358

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		108	50-150
13C8_PFOS		91	50-150
13C8_PFOSA		107	50-150
13C9_PFNA		104	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ15718-001
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/19/2021 1701
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	09/19/2021 1701

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		107	50-150
13C2_6:2FTS		105	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		95	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		106	50-150
13C3-HFPO-DA		107	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		105	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ15718-001
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		98	50-150
13C7_PFUdA		113	50-150
13C8_PFOA		108	50-150
13C8_PFOS		105	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		112	50-150
d5-EtFOSAA		108	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ15107-002
Batch: 15107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/12/2021 1358

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	70-150	09/13/2021 2039
11Cl-PF3OUdS	15	14		1	90	70-150	09/13/2021 2039
8:2 FTS	15	15		1	97	67-138	09/13/2021 2039
6:2 FTS	15	15		1	101	64-140	09/13/2021 2039
4:2 FTS	15	16		1	106	63-143	09/13/2021 2039
GenX	32	30		1	94	70-150	09/13/2021 2039
ADONA	15	16		1	105	70-150	09/13/2021 2039
EtFOSAA	16	15		1	92	61-135	09/13/2021 2039
MeFOSAA	16	15		1	92	65-136	09/13/2021 2039
PFBS	14	14		1	97	72-130	09/13/2021 2039
PFDS	15	14		1	93	53-142	09/13/2021 2039
PFHpS	15	15		1	100	69-134	09/13/2021 2039
PFNS	15	16		1	102	69-127	09/13/2021 2039
PFOSA	16	13		1	82	67-137	09/13/2021 2039
PFPeS	15	17		1	114	71-127	09/13/2021 2039
PFHxS	15	14		1	99	68-131	09/13/2021 2039
PFBA	16	15		1	93	73-129	09/13/2021 2039
PFDA	16	17		1	106	71-129	09/13/2021 2039
PFDoA	16	15		1	95	72-134	09/13/2021 2039
PFHpA	16	17		1	105	72-130	09/13/2021 2039
PFHxA	16	14		1	87	72-129	09/13/2021 2039
PFNA	16	16		1	101	69-130	09/13/2021 2039
PFOA	16	15		1	94	71-133	09/13/2021 2039
PFPeA	16	16		1	99	72-129	09/13/2021 2039
PFTeDA	16	17		1	107	71-132	09/13/2021 2039
PFTrDA	16	16		1	102	65-144	09/13/2021 2039
PFUdA	16	16		1	99	69-133	09/13/2021 2039
PFOS	15	15		1	104	65-140	09/13/2021 2039

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		111	50-150
13C2_6:2FTS		118	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		95	50-150
13C2_PFTeDA		104	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		103	50-150
13C3-HFPO-DA		114	50-150
13C4_PFBA		107	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		116	50-150
13C5_PFPeA		110	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ15107-002
Batch: 15107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/12/2021 1358

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		99	50-150
13C7_PFUdA		106	50-150
13C8_PFOA		108	50-150
13C8_PFOS		101	50-150
13C8_PFOSA		118	50-150
13C9_PFNA		106	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ15718-002
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	91	70-150	09/19/2021 1711
11Cl-PF3OUdS	15	13		1	86	70-150	09/19/2021 1711
8:2 FTS	15	14		1	89	67-138	09/19/2021 1711
6:2 FTS	15	11		1	72	64-140	09/19/2021 1711
4:2 FTS	15	14		1	93	63-143	09/19/2021 1711
GenX	32	31		1	96	70-150	09/19/2021 1711
ADONA	15	15		1	97	70-150	09/19/2021 1711
EtFOSAA	16	15		1	92	61-135	09/19/2021 1711
MeFOSAA	16	16		1	103	65-136	09/19/2021 1711
PFBS	14	13		1	91	72-130	09/19/2021 1711
PFDS	15	14		1	92	53-142	09/19/2021 1711
PFHpS	15	14		1	92	69-134	09/19/2021 1711
PFNS	15	13		1	84	69-127	09/19/2021 1711
PFOSA	16	15		1	92	67-137	09/19/2021 1711
PFPeS	15	13		1	84	71-127	09/19/2021 1711
PFHxS	15	13		1	91	68-131	09/19/2021 1711
PFBA	16	15		1	94	73-129	09/19/2021 1711
PFDA	16	15		1	91	71-129	09/19/2021 1711
PFDoA	16	15		1	94	72-134	09/19/2021 1711
PFHpA	16	16		1	98	72-130	09/19/2021 1711
PFHxA	16	14		1	90	72-129	09/19/2021 1711
PFNA	16	15		1	93	69-130	09/19/2021 1711
PFOA	16	15		1	93	71-133	09/19/2021 1711
PFPeA	16	16		1	97	72-129	09/19/2021 1711
PFTeDA	16	16		1	99	71-132	09/19/2021 1711
PFTrDA	16	14		1	90	65-144	09/19/2021 1711
PFUdA	16	15		1	96	69-133	09/19/2021 1711
PFOS	15	14		1	93	65-140	09/19/2021 1711

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		120	50-150
13C2_6:2FTS		119	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		100	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		116	50-150
13C3-HFPO-DA		110	50-150
13C4_PFBA		113	50-150
13C4_PFHpA		109	50-150
13C5_PFHxA		117	50-150
13C5_PFPeA		110	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ15718-002
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		108	50-150
13C7_PFUdA		122	50-150
13C8_PFOA		113	50-150
13C8_PFOS		110	50-150
13C8_PFOSA		113	50-150
13C9_PFNA		122	50-150
d5-EtFOSAA		115	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCSD

Sample ID: WQ15718-003
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	4.2	70-150	30	09/19/2021 1722
11Cl-PF3OUdS	15	14		1	92	6.7	70-150	30	09/19/2021 1722
8:2 FTS	15	13		1	84	5.4	67-138	30	09/19/2021 1722
6:2 FTS	15	14		1	96	29	64-140	30	09/19/2021 1722
4:2 FTS	15	13		1	90	3.4	63-143	30	09/19/2021 1722
GenX	32	28		1	87	9.7	70-150	30	09/19/2021 1722
ADONA	15	15		1	99	1.7	70-150	30	09/19/2021 1722
EtFOSAA	16	15		1	95	3.0	61-135	30	09/19/2021 1722
MeFOSAA	16	14		1	89	14	65-136	30	09/19/2021 1722
PFBS	14	12		1	88	3.1	72-130	30	09/19/2021 1722
PFDS	15	12		1	80	14	53-142	30	09/19/2021 1722
PFHpS	15	15		1	95	3.4	69-134	30	09/19/2021 1722
PFNS	15	14		1	89	6.8	69-127	30	09/19/2021 1722
PFOSA	16	15		1	92	0.0061	67-137	30	09/19/2021 1722
PFPeS	15	14		1	91	7.2	71-127	30	09/19/2021 1722
PFHxS	15	14		1	97	6.2	68-131	30	09/19/2021 1722
PFBA	16	15		1	93	1.2	73-129	30	09/19/2021 1722
PFDA	16	15		1	96	5.1	71-129	30	09/19/2021 1722
PFDoA	16	16		1	98	4.1	72-134	30	09/19/2021 1722
PFHpA	16	15		1	92	6.4	72-130	30	09/19/2021 1722
PFHxA	16	16		1	101	11	72-129	30	09/19/2021 1722
PFNA	16	15		1	97	4.4	69-130	30	09/19/2021 1722
PFOA	16	15		1	92	0.46	71-133	30	09/19/2021 1722
PFPeA	16	15		1	94	3.4	72-129	30	09/19/2021 1722
PFTeDA	16	16		1	97	1.7	71-132	30	09/19/2021 1722
PFTrDA	16	15		1	94	4.2	65-144	30	09/19/2021 1722
PFUdA	16	15		1	94	2.1	69-133	30	09/19/2021 1722
PFOS	15	12		1	83	11	65-140	30	09/19/2021 1722

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		110	50-150
13C2_6:2FTS		113	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		101	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		110	50-150
13C4_PFBA		110	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		112	50-150
13C5_PFPeA		108	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCSD

Sample ID: WQ15718-003
Batch: 15718
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/17/2021 1758

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		106	50-150
13C7_PFUdA		118	50-150
13C8_PFOA		112	50-150
13C8_PFOS		106	50-150
13C8_PFOSA		108	50-150
13C9_PFNA		113	50-150
d5-EtFOSAA		108	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WH19014

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
AOPC14-SW01-EF-081821	132	240 *	108	96	103	97	97	101	102
AOPC14-SW01-IN-081821	115	271 *	105	92	106	110	96	113	106
AOPC14-SW01-IN-081821	115	155 *	101	97	101	111	104	109	110
WQ15107-001	114	120	90	90	97	96	102	113	105
WQ15107-002	111	118	93	95	104	104	103	114	107
WQ15718-001	107	105	98	99	95	102	106	107	105
WQ15718-002	120	119	109	103	100	110	116	110	113
WQ15718-003	110	113	108	99	101	110	104	110	110

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WH19014

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
AOPC14-SW01-EF-081821	115	101	104	99	92	105	86	94	
AOPC14-SW01-IN-081821	108	96	107	97	97	112	89	92	
AOPC14-SW01-IN-081821	107	110	107	101	115	120	97	112	
WQ15107-001	106	110	111	88	96	108	91	107	
WQ15107-002	107	116	110	99	106	108	101	118	
WQ15718-001	95	104	105	98	113	108	105	101	
WQ15718-002	109	117	110	108	122	113	110	113	
WQ15718-003	106	112	108	106	118	112	106	108	

	QC LIMITS
IDS10 = 13C4_PFHpA	50-150
IDS11 = 13C5_PFHxA	50-150
IDS12 = 13C5_PFPeA	50-150
IDS13 = 13C6_PFDA	50-150
IDS14 = 13C7_PFUdA	50-150
IDS15 = 13C8_PFOA	50-150
IDS16 = 13C8_PFOS	50-150
IDS17 = 13C8_PFOSA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Shealy Environmental Services, Inc. Lot No.: WH19014

Project No.: 103IG667601

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20						TOT OUT
AOPC14-SW01-EF-081821	107	105	106						1
AOPC14-SW01-IN-081821	99	106	107						1
AOPC14-SW01-IN-081821	111	110	108						1
WQ15107-001	104	90	94						0
WQ15107-002	106	97	99						0
WQ15718-001	112	108	103						0
WQ15718-002	122	115	108						0
WQ15718-003	113	108	105						0

	QC LIMITS
IDS18 = 13C9_PFNA	50-150
IDS19 = d5-EtFOSAA	50-150
IDS20 = d3-MeFOSAA	50-150

* Recoveries outside QC limits
D IDS Diluted Out

CLIENT SAMPLE ID

WQ15107-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WH19014

Project No.: 103IG667601
Lab Sample ID: WQ15107-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex 4500_LCMSMS1
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 09/12/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 09/13/2021

Time Analyzed: 20:28

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC14-SW01-EF-081821	WH19014-001		19:14
AOPC14-SW01-IN-081821	WH19014-002		19:24
WQ15107-002	WQ15107-002		20:39

CLIENT SAMPLE ID

WQ15718-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Shealy Environmental Services, Inc.
Lot No.: WH19014

Project No.: 103IG667601
Lab Sample ID: WQ15718-001

Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water

Instrument ID: Sciex_5060884 (QTRAP 4500)_LCMSMS2
Lab File ID:

Extraction Type: SOP SPE
Date Extracted: 09/17/2021

LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 09/19/2021

Time Analyzed: 17:01

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
AOPC14-SW01-IN-081821	WH19014-002		17:54
WQ15718-002	WQ15718-002		17:11
WQ15718-003	WQ15718-003		17:22

Report Date: 17-Sep-2021 11:28:05 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521042.d		
Injection Date:	15-Sep-2021 19:14:20	Injection Vol:	10.0 uL
Sample Type:	Client	Auto Sampler:	26
Lab Sample ID:	WH19014-001	Lab Prep. Batch:	15107
Client ID:	AOPC14-SW01-EF-081821	Sample Group:	WH19014
Sample Info:	WH19014-001 DOD	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V17	16-Sep-2021 08:57:04
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Matrix: Aqueous
Final Conc.: Amt * DF * CF
Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0452223

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	243	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.721	1.721	0	1212955	19	>100:1			1001.00	1084.26	101.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.727	1.727	0/0	308817	19	>100:1			225.49	10.197		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.110	2.110	0	1211927	15	>100:1			1001.00	1116.66	104.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.110	2.110	0/0	285269	11	69:1			211.19	9.5504		M
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.162	2.162	0	365215	14	>100:1			1001.00	1032.52	97.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.162	2.162	0/0	272886	16	>100:1	Target = 3.57		541.33	24.480		
298.9 > 99	44	2.162	2.162		79158	17	>100:1	3.44 (1.78-5.36)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.528	2.528	0/0	163131	14	>100:1	Target = 3.21		438.93	19.849		
349 > 99	44	2.528	2.528		54257	14	>100:1	3.00 (1.60-4.82)					M
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.450	2.459	0	433691	16	>100:1			5005.00	7058.50	132.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.459		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.493	2.493	0	1074702	17	>100:1			1001.00	1094.95	101.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.493	2.493	0/0	561445	13	>100:1	Target = 16.78		491.65	22.233		
313 > 119	49	2.502	2.493		34023	13	>100:1	16.50 (8.39-25.17)					M
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.617	2.625	0	846511	18	>100:1			5005.00	5500.15	100.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.625		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.889	2.890	0	1216727	17	>100:1			1001.00	1199.75	115.2	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.889	2.890	0/0	114778	16	65:1	Target = 3.24		98.795	4.4677		M
363 > 169	47	2.889	2.890		33788	14	36:1	3.39 (1.62-4.86)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.905	2.906	0	300521	17	>100:1			1001.00	1098.76	97.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.905	2.906	0/0	814273	28	>100:1	Target = 3.38	4.79	2222.30	100.50		
399 > 99	45	2.905	2.906		236625	27	>100:1	3.44 (1.69-5.08)	6.16				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.928		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.285	3.287	0/0	34457	21	92:1	Target = 3.37		108.42	4.9031		
449 > 99	45	3.285	3.287		12732	16	4.7:1	2.70 (1.68-5.05)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.252	3.261	0	866031	19	>100:1			5005.00	13313	239.5*	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.254		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.278	3.280	0	1153433	21	>100:1			1001.00	1123.02	105.3	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.278	3.280	0/0	342091	34	>100:1	Target = 2.74	5.13	277.22	12.537		
413 > 169	53	3.278	3.280		130613	35	78:1	2.61 (1.37-4.11)	3.33				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.651	3.662	0	229175	18	>100:1			1001.00	988.41	86.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.526	3.662	-8/-8	611618	38	>100:1	Target = 4.01		2084.41	94.262		M
499 > 99	54	3.651	3.662		135616	44	>100:1	4.50 (2.00-6.01)	1.78				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.865		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		4.004		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.305		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.470		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.658	3.669	0	1165894	19	>100:1			1001.00	1147.39	107.1	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.669		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.901	3.903	0	491088	18	>100:1			1001.00	1076.36	93.9	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.910		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		4.012	4.014	0	912981	16	>100:1			1001.00	1075.94	99.1	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		4.014		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		4.002	4.014	0	274819	18	>100:1			5005.00	6243.03	108.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		4.014		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.171	4.173	0	1431571	18	>100:1			5005.00	5582.70	106.2	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.181		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.321	4.332	0	765552	19	>100:1			1001.00	961.31	92.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.323		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.330	4.332	0	1256380	19	>100:1			5005.00	5747.41	104.6	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.332		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.604	4.606	0	861124	19	>100:1			1001.00	1045.65	96.3	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.606		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.850		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.084	5.085	0	984758	20	>100:1			1001.00	1093.94	102.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		5.085		ND								
*** 37 13C2_PFDA**													
515 > 470		4.012	4.014	0	596214	17	>100:1			200.00			
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.493	2.493	0	719093	17	>100:1			200.00			
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.278	3.287	0	792455	21	>100:1			200.00			
*** 43 13C3_PFBA**													
216 > 172		1.721	1.727	0	927438	19	>100:1			200.00			
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.651	3.662	0	180386	18	>100:1			200.00			

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit
M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521043.d
Injection Date: 15-Sep-2021 19:24:55 Injection Vol: 10.0 uL
Sample Type: Client Auto Sampler: 27
Lab Sample ID: WH19014-002 Lab Prep. Batch: 15107
Client ID: AOPC14-SW01-IN-081821 Sample Group: WH19014
Sample Info: WH19014-002 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Matrix: Aqueous
Final Conc.: Amt * DF * CF
Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0434348

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	253	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: lstds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.721	1.721	0	1268390	18	>100:1			1001.00	1133.81	106.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.727	1.727	0/0	269413	21	72:1			188.12	8.1709		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.110	2.110	0	1248054	15	>100:1			1001.00	1149.94	107.2	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.110	2.110	0/0	280301	13	56:1			201.50	8.7522		M
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.162	2.162	0	413875	14	>100:1			1001.00	1170.09	110.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.162	2.162	0/0	336831	18	>100:1	Target = 3.57		592.65	25.742		
298.9 > 99	44	2.162	2.162		96576	18	>100:1	3.48 (1.78-5.36)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.528	2.528	0/0	207413	13	>100:1	Target = 3.21		492.46	21.390		
349 > 99	44	2.528	2.528		70194	16	>100:1	2.95 (1.60-4.82)					M
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.450	2.459	0	375197	17	>100:1			5005.00	6106.49	114.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.459		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.493	2.493	0	1017664	17	>100:1			1001.00	1036.83	95.8	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.493	2.493	0/0	673354	13	>100:1	Target = 16.78		622.69	27.047		
313 > 119	49	2.493	2.493		45273	15	>100:1	14.87 (8.39-25.17)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.617	2.625	0	945751	18	>100:1			5005.00	6144.96	112.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.625		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.889	2.890	0	1140456	18	>100:1			1001.00	1124.55	108	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													
363 > 319	47	2.880	2.890	0/0	143677	15	>100:1	Target = 3.24		131.94	5.7308		
363 > 169	47	2.889	2.890		37485	18	69:1	3.83 (1.62-4.86)					
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.897	2.906	0	297347	17	>100:1			1001.00	1087.15	96.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													
399 > 80	45	2.897	2.906	0/0	1051228	27	>100:1	Target = 3.38	4.56	2899.62	125.94		
399 > 99	45	2.897	2.906		316640	27	>100:1	3.31 (1.69-5.08)	5.70				
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.928		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													
449 > 80	45	3.278	3.287	0/0	46793	22	>100:1	Target = 3.37		148.81	6.4635		
449 > 99	45	3.278	3.287		17717	19	8.3:1	2.64 (1.68-5.05)					
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.246	3.261	0	980298	21	>100:1			5005.00	15069	271.1*	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													J
427 > 407	64	3.252	3.254	0/0	56379	19	>100:1	Target = 1.66		61.843	2.6861		
427 > 81	64	3.246	3.254		42061	22	>100:1	1.34 (0.83-2.49)					
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.278	3.280	0	1228926	22	>100:1			1001.00	1196.53	112.2	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													
413 > 369	53	3.278	3.280	0/0	435644	41	>100:1	Target = 2.74	5.43	331.35	14.392		
413 > 169	53	3.278	3.280		168232	35	89:1	2.58 (1.37-4.11)	3.60				
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.651	3.662	0	236721	19	>100:1			1001.00	1020.95	89.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													
499 > 80	54	3.658	3.662	0/0	820323	39	>100:1	Target = 4.01	0.72	2706.56	117.56		M
499 > 99	54	3.651	3.662		186199	41	>100:1	4.40 (2.00-6.01)	1.60				
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.865		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		4.004		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.305		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.470		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.658	3.669	0	1073166	20	>100:1			1001.00	1056.13	98.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.669		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.901	3.903	0	481820	19	>100:1			1001.00	1056.04	92.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.910		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		4.012	4.014	0	897660	18	>100:1			1001.00	1057.88	97.4	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		4.014		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		4.002	4.014	0	265827	18	>100:1			5005.00	6038.76	104.6	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		4.014		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.171	4.173	0	1439017	18	>100:1			5005.00	5611.73	106.8	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.181		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.321	4.332	0	807652	17	>100:1			1001.00	1014.17	97.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.323		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.321	4.332	0	1276847	18	>100:1			5005.00	5841.04	106.3	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.332		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.604	4.606	0	826370	18	>100:1			1001.00	1003.45	92.4	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.606		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.850		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.083	5.085	0	1011567	21	>100:1			1001.00	1123.72	105.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		5.085		ND								
*** 37 13C2_PFDA**													
515 > 470		4.002	4.014	0	699644	16	>100:1			200.00			
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.493	2.493	0	703242	17	>100:1			200.00			
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.278	3.287	0	763373	22	>100:1			200.00			
*** 43 13C3_PFBA**													
216 > 172		1.721	1.727	0	941606	20	>100:1			200.00			
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.651	3.662	0	177119	18	>100:1			200.00			

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit
J - Compound Concentration Below Quantitation Limit
M - Compound Hit/Peak Manually Integrated

Report Date: 27-Sep-2021 12:16:51 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 01-Sep-2021 13:35:29 Cal End Date: 01-Sep-2021 15:10:37

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	ICAL 50_SVLC-1596	01-Sep-2021 13:35:29	090121014.d	ICal					Analytes	L-1	1.00		
2	ICAL 100_SVLC-1597	01-Sep-2021 13:46:02	090121015.d	ICal					Analytes	L-2	1.00		
3	ICAL 200_SVLC-1598	01-Sep-2021 13:56:33	090121016.d	ICal					Analytes	L-3	1.00		
4	ICAL 500_SVLC-1599	01-Sep-2021 14:07:08	090121017.d	ICal					Analytes	L-4	1.00		PFDS passes @ 129.7%
5	ICAL 1000_SVLC-1619	01-Sep-2021 14:17:40	090121018.d	ICal					Analytes	L-5	1.00		
6	ICAL 2000_SVLC-1601	01-Sep-2021 14:28:14	090121019.d	ICal					Analytes	L-6	1.00		
7	ICAL 5000_SVLC-1602	01-Sep-2021 14:38:47	090121020.d	ICal					Analytes	L-7	1.00		
8	ICAL 10000_SVLC-1603	01-Sep-2021 14:49:24	090121021.d	ICal					Analytes	L-8	1.00		
9	ICAL 15000_SVLC-1604	01-Sep-2021 15:00:00	090121022.d	ICal					Analytes	L-9	1.00		
10	ICAL 20000_SVLC-1605	01-Sep-2021 15:10:37	090121023.d	ICal					Analytes	L-10	1.00		
100	ID BLK C1	01-Sep-2021 15:21:24	090121024.d	InstBlk					Surrogates	Smp	0.1100		
11	ICV 500_SVLC-1629	01-Sep-2021 15:32:06	090121025.d	InstBlk					Surrogates	Smp	0.1100		RR-8:2 FTS LOW
12	ISOMERS_SVLC-1620	01-Sep-2021 15:42:50	090121026.d	CheckStd					Surrogates	Smp	1.00	Yes	RR
11	ICV 500_SVLC-1629	01-Sep-2021 16:46:15	090121032.d	ICV					Analytes	ICV	1.00		
12	ISOMERS_SVLC-1620	01-Sep-2021 16:56:48	090121033.d	CheckStd					Surrogates	Smp	1.00	Yes	
13	ID IBLK A	01-Sep-2021 17:07:20	090121034.d	InstBlk					Surrogates	Smp	0.1100		
39	CCV 1000A_SVLC-1619	01-Sep-2021 21:53:07	090121061.d	CCV					Analytes	L-5	1.00		
100	CCB C2	01-Sep-2021 22:03:43	090121062.d	InstBlk					Surrogates	Smp	0.1100		
40	WH27065-003	01-Sep-2021 22:14:24	090121063.d	Client	AFFF01-MW10-082621-00-T5	Aqueous	1	13839	Surrogates	Smp	0.1100		
41	WH27065-004	01-Sep-2021 22:25:03	090121064.d	Client	AFFF01-MW09-082621-00-T5	Aqueous	1	13839	Surrogates	Smp	0.1100		
42	WH27065-005	01-Sep-2021 22:35:36	090121065.d	Client	AFFF01-MW08-082621-00-T5	Aqueous	1	13839	Surrogates	Smp	0.1100		SURS LOW-NCM/MTX, RX-6:2 SUR HIGH W/DETECT
43	WH27065-006	01-Sep-2021 22:46:08	090121066.d	Client	AFFF01-MW02-082621-00-T5	Aqueous	1	13839	Surrogates	Smp	0.1100		RX-6:2 SUR HIGH W/DETECT
44	WH27065-007	01-Sep-2021 22:56:43	090121067.d	Client	AFFF01-MW01-082621-00-T5	Aqueous	1	13839	Surrogates	Smp	0.1100		
45	WH27065-008	01-Sep-2021 23:07:18	090121068.d	Client	AFFF01-MW04-082621-01-T5	Aqueous	1	13839	Surrogates	Smp	0.1100		
46	WH27065-009	01-Sep-2021 23:17:53	090121069.d	Client	AFFF01-MW04-082621-00-T5	Aqueous	1	13839	Surrogates	Smp	0.1100		
47	WH28003-003	01-Sep-2021 23:28:28	090121070.d	Client	AFFF01-MW03-082721-00-T5	Aqueous	1	13839	Surrogates	Smp	0.1100		RR-5X
48	WH28003-003MS	01-Sep-2021 23:39:05	090121071.d	MS		Aqueous	1	13839	Analytes	100x PDS	0.2000		
49	WH28003-003MD	01-Sep-2021 23:49:42	090121072.d	MSD		Aqueous	1	13839	Analytes	100x PDS	0.2000		
50	WH28003-004	02-Sep-2021 00:00:20	090121073.d	Client	AFFF01-MW05-082721-00-T5	Aqueous	1	13839	Surrogates	Smp	0.1100		RR-1X-C/O
51	WH13053-001	02-Sep-2021 00:10:59	090121074.d	Client	372 Sample 2	Soil	1	13705	Surrogates	Smp	0.1100		
52	CCV 1000B_SVLC-1619	02-Sep-2021 00:21:34	090121075.d	CCV					Analytes	L-5	1.00		
100	CCB C3	02-Sep-2021 00:32:09	090121076.d	InstBlk					Surrogates	Smp	0.1100		
53	WH26055-001	02-Sep-2021 00:42:50	090121077.d	Client	RSA-STP3-SO-1-082321	Soil	1	13705	Surrogates	Smp	0.1100		RX-PFDA SUR LOW
66	CCV 1000C_SVLC-1619	02-Sep-2021 03:00:47	090121090.d	CCV					Analytes	L-5	1.00		

Report Date: 28-Sep-2021 14:53:16 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\091321-DOD-R.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 01-Sep-2021 13:35:29 Cal End Date: 01-Sep-2021 15:10:37

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1640	13-Sep-2021 13:08:08	091321005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1641	13-Sep-2021 13:18:40	091321006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	13-Sep-2021 13:29:12	091321007.d	InstBlk					Surrogates	Smp	0.1100		
9	ID CCV 1000_SVLC-1638	13-Sep-2021 15:10:47	091321016.d	CCV					Analytes	L-5	1.00		
97	CCB 1	13-Sep-2021 15:21:24	091321017.d	InstBlk					Surrogates	Smp	0.1100		
16	WH19021-002	13-Sep-2021 16:35:29	091321024.d	Client	7A-979	Aqueous	10	14899	Surrogates	Smp	0.1100		
17	WH19021-003	13-Sep-2021 16:46:04	091321025.d	Client	7B-979	Aqueous	50	14899	Surrogates	Smp	0.1100		
18	WH19021-004	13-Sep-2021 16:56:41	091321026.d	Client	7C-729	Aqueous	20	14899	Surrogates	Smp	0.1100		
19	WH19021-005	13-Sep-2021 17:07:15	091321027.d	Client	7D-729	Aqueous	5	14899	Surrogates	Smp	0.1100		
20	ID CCV 1000A_SVLC-1638	13-Sep-2021 17:17:53	091321028.d	CCV					Analytes	L-5	1.00		
97	CCB 2	13-Sep-2021 17:28:34	091321029.d	InstBlk					Surrogates	Smp	0.1100		
21	WQ15118-001	13-Sep-2021 17:39:10	091321030.d	MBlk		Soil	1	15118	Surrogates	Smp	0.1100		
22	WQ15118-002	13-Sep-2021 17:49:43	091321031.d	LCS		Soil	1	15118	Analytes	100x PDS	0.1000		MeFOSE LOW-NT
23	WH27075-031	13-Sep-2021 18:00:16	091321032.d	Client	ASTC-SC-14SS(1-2)-(08262	Soil	1	15118	Surrogates	Smp	0.1100		
24	WH27075-031MS	13-Sep-2021 18:10:50	091321033.d	MS		Soil	1	15118	Analytes	100x PDS	0.1000		
25	WH27075-031MD	13-Sep-2021 18:21:24	091321034.d	MSD		Soil	1	15118	Analytes	100x PDS	0.1000		
26	WH27079-014	13-Sep-2021 18:32:00	091321035.d	Client	Dup-01082421)	Soil	1	15118	Surrogates	Smp	0.1100		
27	WH27079-017	13-Sep-2021 18:42:35	091321036.d	Client	ASTC-SC-04SS(0-1)-(08242	Soil	1	15118	Surrogates	Smp	0.1100		
28	WH27079-018	13-Sep-2021 18:53:14	091321037.d	Client	ASTC-SC-04SS(5.5-6.5)-(0	Soil	1	15118	Surrogates	Smp	0.1100		
29	WH27079-019	13-Sep-2021 19:03:50	091321038.d	Client	ASTC-SC-04SS(11-12)-(082	Soil	1	15118	Surrogates	Smp	0.1100		
30	WH27079-021	13-Sep-2021 19:14:27	091321039.d	Client	ASTC-SC-05SS(0-1)-(08242	Soil	1	15118	Surrogates	Smp	0.1100		
31	WH27079-022	13-Sep-2021 19:25:05	091321040.d	Client	ASTC-SC-05SS(5.5-6.5)-(0	Soil	1	15118	Surrogates	Smp	0.1100		
32	WH27079-023	13-Sep-2021 19:35:37	091321041.d	Client	ASTC-SC-05SS(11-12)-(082	Soil	1	15118	Surrogates	Smp	0.1100		
33	WH27079-025	13-Sep-2021 19:46:09	091321042.d	Client	ASTC-SC-06SS(0-1)-(08242	Soil	1	15118	Surrogates	Smp	0.1100		
34	WH27079-026	13-Sep-2021 19:56:45	091321043.d	Client	ASTC-SC-06SS(5-6)-(08242	Soil	1	15118	Surrogates	Smp	0.1100		
35	ID CCV 1000B_SVLC-1638	13-Sep-2021 20:07:22	091321044.d	CCV					Analytes	L-5	1.00		EtFOSE HIGH-OK/NT
97	CCB 3	13-Sep-2021 20:17:58	091321045.d	InstBlk					Surrogates	Smp	0.1100		
36	WQ15107-001	13-Sep-2021 20:28:32	091321046.d	MBlk		Aqueous	1	15107	Surrogates	Smp	0.1100		
37	WQ15107-002	13-Sep-2021 20:39:07	091321047.d	LCS		Aqueous	1	15107	Analytes	100x PDS	0.2000		
38	WH27079-027	13-Sep-2021 20:49:43	091321048.d	Client	ASTC-SC-06SS(10-11)-(082	Soil	1	15118	Surrogates	Smp	0.1100		
39	WH27079-027MS	13-Sep-2021 21:00:19	091321049.d	MS		Soil	1	15118	Analytes	100x PDS	0.1000		
40	WH27079-027MD	13-Sep-2021 21:10:55	091321050.d	MSD		Soil	1	15118	Analytes	100x PDS	0.1000		
41	WH27079-029	13-Sep-2021 21:21:34	091321051.d	Client	ASTC-SC-07SS(0-1)-(08242	Soil	1	15118	Surrogates	Smp	0.1100		
42	WH27079-030	13-Sep-2021 21:32:06	091321052.d	Client	ASTC-SC-07SS(5-6)-(08242	Soil	1	15118	Surrogates	Smp	0.1100		
43	WH27079-031	13-Sep-2021 21:42:39	091321053.d	Client	ASTC-SC-07SS(10-11)-(082	Soil	1	15118	Surrogates	Smp	0.1100		
44	WH27079-032	13-Sep-2021 21:53:15	091321054.d	Client	Dup-03(082421)	Soil	1	15118	Surrogates	Smp	0.1100		
45	WI04012-001	13-Sep-2021 22:03:49	091321055.d	Client	382-5-Sand	Soil	1	15118	Surrogates	Smp	0.1100		
49	WH18013-001	13-Sep-2021 22:46:13	091321059.d	Client	FL-04-WW-20210817	Aqueous	50	14899	Surrogates	Smp	0.1100		6:2 sur high-not reported @ 50x
50	ID CCV 1000C_SVLC-1638	13-Sep-2021 22:56:50	091321060.d	CCV					Analytes	L-5	1.00		
52	WH20022-001	13-Sep-2021 23:18:04	091321062.d	Client	UST1-GAC2-70K20210819	Aqueous	50	15107	Surrogates	Smp	0.1100		RR-500X
53	WH20022-002	13-Sep-2021 23:28:38	091321063.d	Client	UST1-02B-70K20210819	Aqueous	50	15107	Surrogates	Smp	0.1100		RR-500X
54	WH20022-003	13-Sep-2021 23:39:15	091321064.d	Client	UST1-GAC5B-70K20210819	Aqueous	50	15107	Surrogates	Smp	0.1100		RR-50X
55	WH19014-001	13-Sep-2021 23:49:49	091321065.d	Client	AOPC14-SW01-EF-081821	Aqueous	50	15107	Surrogates	Smp	0.1100		RR-1X
56	WH19014-002	14-Sep-2021 00:00:27	091321066.d	Client	AOPC14-SW01-IN-081821	Aqueous	50	15107	Surrogates	Smp	0.1100		

Not Used

Report Date: 17-Sep-2021 11:28:50 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 15-Sep-2021 14:39:12 Cal End Date: 15-Sep-2021 16:14:22

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	ICAL 50_SVLC-1639	15-Sep-2021 14:39:12	091521016.d	ICal					Analytes	L-1	1.00		
2	ICAL 100_SVLC-1640	15-Sep-2021 14:49:45	091521017.d	ICal					Analytes	L-2	1.00		
3	ICAL 200_SVLC-1641	15-Sep-2021 15:00:16	091521018.d	ICal					Analytes	L-3	1.00		
4	ICAL 500_SVLC-1642	15-Sep-2021 15:10:50	091521019.d	ICal					Analytes	L-4	1.00		
5	ICAL 1000_SVLC-1638	15-Sep-2021 15:21:23	091521020.d	ICal					Analytes	L-5	1.00		
6	ICAL 2000_SVLC-1643	15-Sep-2021 15:31:58	091521021.d	ICal					Analytes	L-6	1.00		
7	ICAL 5000_SVLC-1644	15-Sep-2021 15:42:31	091521022.d	ICal					Analytes	L-7	1.00		
8	ICAL 10000_SVLC-1645	15-Sep-2021 15:53:08	091521023.d	ICal					Analytes	L-8	1.00		
9	ICAL 15000_SVLC-1646	15-Sep-2021 16:03:44	091521024.d	ICal					Analytes	L-9	1.00		
10	ICAL 20000_SVLC-1647	15-Sep-2021 16:14:22	091521025.d	ICal					Analytes	L-10	1.00		
100	ID BLK C1	15-Sep-2021 16:25:00	091521026.d	InstBlk					Surrogates	Smp	0.1100		
11	ICV 500_SVLC-1629	15-Sep-2021 16:35:41	091521027.d	ICV					Analytes	ICV	1.00		
12	ISOMERS_SVLC-1620	15-Sep-2021 16:46:13	091521028.d	CheckStd					Surrogates	Smp	1.00	Yes	
13	ID IBLK A	15-Sep-2021 16:56:47	091521029.d	InstBlk					Surrogates	Smp	0.1100		
20	CCV 1000_SVLC-1643	15-Sep-2021 18:10:54	091521036.d	CCV					Analytes	L-5	1.00		4:2,6:2 SURS HIGH-TARGETS PASS-NCM
26	WH19014-001	15-Sep-2021 19:14:20	091521042.d	Client	AOPC14-SW01-EF-081821	Aqueous	1	15107	Surrogates	Smp	0.1100		6:2 SUR HIGH-NCM/ND
27	WH19014-002	15-Sep-2021 19:24:55	091521043.d	Client	AOPC14-SW01-IN-081821	Aqueous	1	15107	Surrogates	Smp	0.1100		RX-6:2 SUR HIGH-W/DETECT
28	WQ15321-001	15-Sep-2021 19:35:32	091521044.d	MBlk		Aqueous	1	15321	Surrogates	Smp	0.1100		
29	WQ15321-002	15-Sep-2021 19:46:08	091521045.d	LCS		Aqueous	1	15321	Analytes	100x PDS	0.2000		
30	WH13098-010	15-Sep-2021 19:56:44	091521046.d	Client	IDW-GW-10-08112021	Aqueous	1	15321	Surrogates	Smp	0.1100		6:2 SUR HIGH-NCM/ND
31	WH13098-012	15-Sep-2021 20:07:22	091521047.d	Client	IDW-GW-12-08112021	Aqueous	1	15321	Surrogates	Smp	0.1100		4:2 SUR HIGH-NCM/ND
32	WH21004-002	15-Sep-2021 20:17:54	091521048.d	Client	C0AB8	Aqueous	1	15321	Surrogates	Smp	0.1100		
33	CCV 1000A_SVLC-1643	15-Sep-2021 20:28:26	091521049.d	CCV					Analytes	L-5	1.00		
100	CCB C1	15-Sep-2021 20:39:02	091521050.d	InstBlk					Surrogates	Smp	0.1100		
34	WH21004-003	15-Sep-2021 20:49:43	091521051.d	Client	C0AB9	Aqueous	1	15321	Surrogates	Smp	0.1100		
35	WH21004-003MS	15-Sep-2021 21:00:18	091521052.d	MS		Aqueous	1	15321	Analytes	100x PDS	0.2000		
36	WH21004-003MD	15-Sep-2021 21:10:58	091521053.d	MSD		Aqueous	1	15321	Analytes	100x PDS	0.2000		
37	WH21004-004	15-Sep-2021 21:21:34	091521054.d	Client	C0AC0	Aqueous	1	15321	Surrogates	Smp	0.1100		
38	WH21004-005	15-Sep-2021 21:32:11	091521055.d	Client	C0AF1	Aqueous	1	15321	Surrogates	Smp	0.1100		
39	WH21004-006	15-Sep-2021 21:42:47	091521056.d	Client	C0AF3	Aqueous	1	15321	Surrogates	Smp	0.1100		
40	WH21004-007	15-Sep-2021 21:53:24	091521057.d	Client	C0AF4	Aqueous	1	15321	Surrogates	Smp	0.1100		
41	WH21004-008	15-Sep-2021 22:04:04	091521058.d	Client	C0AF5	Aqueous	1	15321	Surrogates	Smp	0.1100		
42	WH21006-001	15-Sep-2021 22:14:38	091521059.d	Client	C0AC9	Aqueous	1	15321	Surrogates	Smp	0.1100		
43	WH21006-002	15-Sep-2021 22:25:12	091521060.d	Client	C0AF0	Aqueous	1	15321	Surrogates	Smp	0.1100		
44	WH24023-001	15-Sep-2021 22:35:48	091521061.d	Client	SP-21-01	Aqueous	1	15321	Surrogates	Smp	0.1100		
45	WH24023-002	15-Sep-2021 22:46:23	091521062.d	Client	SP-21-02	Aqueous	1	15321	Surrogates	Smp	0.1100		RR-10X
46	CCV 1000B_SVLC-1643	15-Sep-2021 22:56:59	091521063.d	CCV					Analytes	L-5	1.00		
100	CCB C2	15-Sep-2021 23:07:34	091521064.d	InstBlk					Surrogates	Smp	0.1100		
47	WH24023-003	15-Sep-2021 23:18:15	091521065.d	Client	SP-21-02-DUP	Aqueous	1	15321	Surrogates	Smp	0.1100		SEVERAL SURS LOW-NCM/MTX, rr-10x
48	WH24023-004	15-Sep-2021 23:28:52	091521066.d	Client	MW-21-06A-081921	Aqueous	1	15321	Surrogates	Smp	0.1100		RR-1X-C/O
49	WH24023-004MS	15-Sep-2021 23:39:29	091521067.d	MS		Aqueous	1	15321	Analytes	100x PDS	0.2000		
50	WH24023-004MD	15-Sep-2021 23:50:06	091521068.d	MSD		Aqueous	1	15321	Analytes	100x PDS	0.2000		
51	WH24023-005	16-Sep-2021 00:00:45	091521069.d	Client	MW-21-04A-081921	Aqueous	1	15321	Surrogates	Smp	0.1100		
52	WH24023-006	16-Sep-2021 00:11:19	091521070.d	Client	MW-21-06B-081921	Aqueous	1	15321	Surrogates	Smp	0.1100		RR-5X

Report Date: 17-Sep-2021 11:28:50 AIM Revision: 2.0.2021.0812

Batch Path: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
53	WH24023-007	16-Sep-2021 00:21:54	091521071.d	Client	MW-21-06B-081921-DUP	Aqueous	1	15321	Surrogates	Smp	0.1100		RR-5X
54	CCV 1000C_SVLC-1643	16-Sep-2021 00:32:31	091521072.d	CCV					Analytes	L-5	1.00		
100	CCB C2	16-Sep-2021 00:43:08	091521073.d	InstBlk					Surrogates	Smp	0.1100		
55	WH20022-001	16-Sep-2021 00:53:50	091521074.d	Client	UST1-GAC2-70K20210819	Aqueous	500	15107	Surrogates	Smp	0.1100		
56	WH20022-002	16-Sep-2021 01:04:27	091521075.d	Client	UST1-02B-70K20210819	Aqueous	500	15107	Surrogates	Smp	0.1100		
57	WH20022-003	16-Sep-2021 01:15:05	091521076.d	Client	UST1-GAC5B-70K20210819	Aqueous	50	15107	Surrogates	Smp	0.1100		
58	WH19014-001	16-Sep-2021 01:25:43	091521077.d	Client	AOPC14-SW01-EF-081821	Aqueous	1	15107	Surrogates	Smp	0.1100		NOT NEEDED
59	WH19014-002	16-Sep-2021 01:36:20	091521078.d	Client	AOPC14-SW01-IN-081821	Aqueous	1	15107	Surrogates	Smp	0.1100		NOT NEEDED
63	CCV 1000D_SVLC-1643	16-Sep-2021 02:18:45	091521082.d	CCV					Analytes	L-5	1.00		

Not used

Report Date: 17-Sep-2021 15:03:08 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 16-Sep-2021 17:50:57 Cal End Date: 16-Sep-2021 19:26:41

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	F.L. ICAL 50_SVLC-1639	16-Sep-2021 17:50:57	091621013.d	ICal					Analytes	L-1	1.00		
2	F.L. ICAL 100_SVLC-1640	16-Sep-2021 18:01:36	091621014.d	ICal					Analytes	L-2	1.00		
3	F.L. ICAL 200_SVLC-1641	16-Sep-2021 18:12:14	091621015.d	ICal					Analytes	L-3	1.00		
4	F.L. ICAL 500_SVLC-1642	16-Sep-2021 18:22:54	091621016.d	ICal					Analytes	L-4	1.00		
5	F.L. ICAL 1000_SVLC-1638	16-Sep-2021 18:33:27	091621017.d	ICal					Analytes	L-5	1.00		
6	F.L. ICAL 2000_SVLC-1643	16-Sep-2021 18:44:07	091621018.d	ICal					Analytes	L-6	1.00		
7	F.L. ICAL 5000_SVLC-1644	16-Sep-2021 18:54:42	091621019.d	ICal					Analytes	L-7	1.00		
8	F.L. ICAL 10000_SVLC-1645	16-Sep-2021 19:05:23	091621020.d	ICal					Analytes	L-8	1.00		
9	F.L. ICAL 15000_SVLC-1646	16-Sep-2021 19:16:01	091621021.d	ICal					Analytes	L-9	1.00		
10	F.L. ICAL 20000_SVLC-1647	16-Sep-2021 19:26:41	091621022.d	ICal					Analytes	L-10	1.00		
11	ID IBLK A	16-Sep-2021 19:37:21	091621023.d	InstBlk					Surrogates	Smp	0.1100		
12	F.L. ICV 500_SVLC-1651	16-Sep-2021 19:47:57	091621024.d	ICV					Analytes	ICV	1.00		
13	ISOMER CHECK STD_SVLC-1652	16-Sep-2021 19:58:30	091621025.d	CheckStd					IsomerCheck	Smp	1.00		
14	ID IBLK B	16-Sep-2021 20:09:04	091621026.d	InstBlk					Surrogates	Smp	0.1100		
15	WQ15385-001	16-Sep-2021 20:19:45	091621027.d	MBlk		Aqueous	1	15385	Surrogates	Smp	0.1100		
16	WQ15385-002	16-Sep-2021 20:30:20	091621028.d	LCS		Aqueous	1	15385	Analytes	100x PDS	0.2000		
17	WQ15238-002	16-Sep-2021 20:40:57	091621029.d	LCS		Aqueous	1	15238	Analytes	100x PDS	0.2000		6:2 CONFIRMED HIGH - WH20022 ONLY
18	WI01002-012	16-Sep-2021 20:51:32	091621030.d	Client	288	Soil	5	15166	Surrogates	Smp	0.1100		
25	WH20022-004	16-Sep-2021 22:06:03	091621037.d	Client	UST1-IX1B-70K20210819	Aqueous	50	15238	Surrogates	Smp	0.1100		LCS 6:2 - ND, NCM
28	ID CCV 1000_SVLC-1638	16-Sep-2021 22:37:57	091621040.d	CCV					Analytes	L-5	1.00		
95	CCB 1	16-Sep-2021 22:48:34	091621041.d	InstBlk					Surrogates	Smp	0.1100		
37	WH25013-001	17-Sep-2021 00:24:13	091621050.d	Client	001-66(08242021)	Aqueous	1	15385	Surrogates	Smp	0.1100		SUR 4:2/8:2(ND), 6:2(DET) - RR TO CONFIRM; NO RX
38	WH25013-002	17-Sep-2021 00:34:53	091621051.d	Client	001-37(08242021)	Aqueous	1	15385	Surrogates	Smp	0.1100		SUR 4:2/6:2/NA/8:2/Me/EtFOSAA (ND) - NCM
39	ID CCV 1000A_SVLC-1638	17-Sep-2021 00:45:32	091621052.d	CCV					Analytes	L-5	1.00		
95	CCB 2	17-Sep-2021 00:56:11	091621053.d	InstBlk					Surrogates	Smp	0.1100		
40	WH25013-003	17-Sep-2021 01:06:50	091621054.d	Client	001-46(08242021)	Aqueous	1	15385	Surrogates	Smp	0.1100		SUR 4:2/6:2/8:2/Me/EtFOSAA (ND) - NCM
41	WH25013-004	17-Sep-2021 01:17:31	091621055.d	Client	001-72(08242021)	Aqueous	1	15385	Surrogates	Smp	0.1100		SUR 4:2(ND) - NCM
42	WH25013-005	17-Sep-2021 01:28:08	091621056.d	Client	001-60(08242021)	Aqueous	1	15385	Surrogates	Smp	0.1100		SUR 4:2/6:2/8:2/Me/EtFOSAA (ND) - NCM; RR - 5X
43	WH25013-006	17-Sep-2021 01:38:45	091621057.d	Client	Equipment Blank-01(08242	Aqueous	1	15385	Surrogates	Smp	0.1100		
44	WH25013-007	17-Sep-2021 01:49:27	091621058.d	Client	Field Blank(08242021)	Aqueous	1	15385	Surrogates	Smp	0.1100		SUR UNSPIKED?? - RR TO CONFIRM
45	WH25013-008	17-Sep-2021 02:00:03	091621059.d	Client	Outfall 001A(08242021)	Aqueous	1	15385	Surrogates	Smp	0.1100		
46	WH25013-008MS	17-Sep-2021 02:10:39	091621060.d	MS		Aqueous	1	15385	Analytes	100x PDS	0.2000		
47	WH25013-008MD	17-Sep-2021 02:21:16	091621061.d	MSD		Aqueous	1	15385	Analytes	100x PDS	0.2000		
48	WH25013-009	17-Sep-2021 02:31:58	091621062.d	Client	West Pond(08242021)	Aqueous	1	15385	Surrogates	Smp	0.1100		
49	WH25013-010	17-Sep-2021 02:42:35	091621063.d	Client	Dup-01(08242021)	Aqueous	1	15385	Surrogates	Smp	0.1100		SUR 4:2/8:2/Me/EtFOSAA(ND), 6:2(DET) - RR; NO RX
50	WH25013-011	17-Sep-2021 02:53:18	091621064.d	Client	GW Lift Station(08242021	Aqueous	1	15385	Surrogates	Smp	0.1100		
51	WH25013-012	17-Sep-2021 03:03:58	091621065.d	Client	001-58(08242021)	Aqueous	1	15385	Surrogates	Smp	0.1100		
52	ID CCV 1000B_SVLC-1638	17-Sep-2021 03:14:37	091621066.d	CCV					Analytes	L-5	1.00		
53	WH24023-008	17-Sep-2021 03:25:13	091621067.d	Client	MW-21-02A-082021	Aqueous	50	15385	Surrogates	Smp	0.1100		RR - 5X
54	WH24023-009	17-Sep-2021 03:35:48	091621068.d	Client	MW-21-04B-082021	Aqueous	50	15385	Surrogates	Smp	0.1100		RR - 20X
55	WH24023-010	17-Sep-2021 03:46:25	091621069.d	Client	MW-21-02B-082021	Aqueous	50	15385	Surrogates	Smp	0.1100		RR - 10X
56	WH24023-011	17-Sep-2021 03:57:03	091621070.d	Client	MW-21-05A-082021	Aqueous	50	15385	Surrogates	Smp	0.1100		RR - 1X
57	WH24023-012	17-Sep-2021 04:07:42	091621071.d	Client	MW-21-01A-082021	Aqueous	50	15385	Surrogates	Smp	0.1100		RR - 1X

Report Date: 20-Sep-2021 10:29:38 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS02.i\091921-DOD.b

Method: LCMSMS02_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 16-Sep-2021 17:50:57 Cal End Date: 16-Sep-2021 19:26:41

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	ID CCV 100_SVLC-1656	19-Sep-2021 16:29:12	091921005.d	CCV					Analytes	L-2	1.00		
96	ID CCV 200_SVLC-1641	19-Sep-2021 16:39:46	091921006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	19-Sep-2021 16:50:19	091921007.d	InstBlk					Surrogates	Smp	0.1100		
1	WQ15718-001	19-Sep-2021 17:01:01	091921008.d	MBlk		Aqueous	1	15718	Surrogates	Smp	0.1100		
2	WQ15718-002	19-Sep-2021 17:11:39	091921009.d	LCS		Aqueous	1	15718	Analytes	100x PDS	0.2000		
3	WQ15718-003	19-Sep-2021 17:22:16	091921010.d	LCSD		Aqueous	1	15718	Analytes	100x PDS	0.2000		
6	WH19014-002	19-Sep-2021 17:54:06	091921013.d	Client	AOPC14-SW01-IN-081821	Aqueous	1	15718	Surrogates	Smp	0.1100		SUR: 6:2(DET),CONFIRMS,NCM
7	WH26085-001	19-Sep-2021 18:04:39	091921014.d	Client	MH1153-PFAS-08242021	Aqueous	1	15718	Surrogates	Smp	0.1100		SUR:4:2(ND),6:2(ND),8:2(ND),NCM
8	WH26085-001MS	19-Sep-2021 18:15:21	091921015.d	MS		Aqueous	1	15718	Analytes	100x PDS	0.2000		
9	WH26085-002	19-Sep-2021 18:25:59	091921016.d	Client	MH1153-EB-08242021	Aqueous	1	15718	Surrogates	Smp	0.1100		
10	WH26085-003	19-Sep-2021 18:36:38	091921017.d	Client	MH1153-WB-08242021	Aqueous	1	15718	Surrogates	Smp	0.1100		SUR:6:2(ND),NCM
11	WI17023-004	19-Sep-2021 18:47:17	091921018.d	Client	385-4-W-UT-1	Aqueous	1	15718	Surrogates	Smp	0.1100		
12	WI17023-005	19-Sep-2021 18:57:57	091921019.d	Client	385-4-W-T-1	Aqueous	1	15718	Surrogates	Smp	0.1100		RR-1X, BAD INJECTION
13	WH27079-005	19-Sep-2021 19:08:30	091921020.d	Client	ASTC-SC-01GW(11-15)-(082	Aqueous	1	15718	Surrogates	Smp	0.1100		
14	WH27079-005DU	19-Sep-2021 19:19:05	091921021.d	Client		Aqueous	1	15718	Surrogates	Smp	0.1100		
15	ID CCV 1000_SVLC-1638	19-Sep-2021 19:29:45	091921022.d	CCV					Analytes	L-5	1.00		
97	CCB 1	19-Sep-2021 19:40:23	091921023.d	InstBlk					Surrogates	Smp	0.1100		
25	WI17023-007	19-Sep-2021 21:26:35	091921033.d	Client	DUP-03	Aqueous	1	15718	Surrogates	Smp	0.1100		
26	ID CCV 1000A_SVLC-1638	19-Sep-2021 21:37:11	091921034.d	CCV					Analytes	L-5	1.00		
97	CCB 2	19-Sep-2021 21:47:49	091921035.d	InstBlk					Surrogates	Smp	0.1100		
27	WH25023-002	19-Sep-2021 21:58:26	091921036.d	Client	ASTC-SAN-MH01WW-082421	Aqueous	1	15602	Surrogates	Smp	0.1100		multiple sur failures,cent,NCM
28	WH25023-008	19-Sep-2021 22:09:07	091921037.d	Client	ASTC-SAN-MH03WW-082421	Aqueous	1	15602	Surrogates	Smp	0.1100		multiple sur failures, RX
29	WH25023-010	19-Sep-2021 22:19:44	091921038.d	Client	ASTC-SAN-MH05WW-082421	Aqueous	1	15602	Surrogates	Smp	0.1100		RR-1X, BAD INJECTION?
30	WH26055-005	19-Sep-2021 22:30:22	091921039.d	Client	RSA-RS1427-GW-082321	Aqueous	5	15602	Surrogates	Smp	0.1100		
31	ID CCV 1000B_SVLC-1638	19-Sep-2021 22:41:02	091921040.d	CCV					Analytes	L-5	1.00		

Pace Environmental Services, LLC
Initial Calibration Signal Ratios Report

Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 01-Sep-2021 13:35:29 Cal End Date: 01-Sep-2021 15:10:37
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b

Level	Cal File	Cal Sample ID	Cal Date
1	090121014.d	ICAL 50_SVLC-1596	01-Sep-2021 13:35:29
2	090121015.d	ICAL 100_SVLC-1597	01-Sep-2021 13:46:02
3	090121016.d	ICAL 200_SVLC-1598	01-Sep-2021 13:56:33
4	090121017.d	ICAL 500_SVLC-1599	01-Sep-2021 14:07:08
5	090121018.d	ICAL 1000_SVLC-1619	01-Sep-2021 14:17:40
6	090121019.d	ICAL 2000_SVLC-1601	01-Sep-2021 14:28:14
7	090121020.d	ICAL 5000_SVLC-1602	01-Sep-2021 14:38:47
8	090121021.d	ICAL 10000_SVLC-1603	01-Sep-2021 14:49:24
9	090121022.d	ICAL 15000_SVLC-1604	01-Sep-2021 15:00:00
10	090121023.d	ICAL 20000_SVLC-1605	01-Sep-2021 15:10:37

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	Avg. +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.550	3.735	3.486	3.704	3.771	4.044	3.625	3.729	3.738	3.627	3.700	3.253-4.148	0.14928	1.850
1 4:2 FTS	0.824	1.379	1.057	1.795	1.455	1.477	1.665	1.559	1.648	1.601	1.446	0.580-2.311	0.28859	0.723
15 PFHxA	15.455	20.694	14.878	15.719	18.381	18.427	15.354	16.865	15.403	14.815	16.599	10.308-22.889	2.09696	8.299
22 PFPeS	3.361	3.134	3.634	3.301	3.298	3.111	3.168	3.163	3.493	3.278	3.294	2.815-3.772	0.15944	1.647
28 GenX	0.659	1.078	0.824	0.884	0.746	0.885	0.833	0.818	0.825	0.956	0.850	0.521-1.179	0.10963	0.425
13 PFHpA	2.719	3.248	2.931	3.398	3.279	3.062	3.478	3.137	2.939	3.156	3.134	2.463-3.806	0.22380	1.567
14 PFHxS	4.122	2.985	3.944	3.409	3.467	3.312	3.436	3.484	3.442	3.037	3.463	2.465-4.462	0.33290	1.731
29 ADONA	2.890	2.561	2.398	2.899	2.965	2.626	2.775	2.534	2.652	2.479	2.677	2.097-3.257	0.19336	1.338
2 6:2 FTS	1.916	1.400	1.688	1.686	1.588	1.581	1.873	1.523	1.529	1.657	1.644	1.184-2.104	0.15330	0.822
20 PFOA	3.242	2.924	2.835	3.066	3.166	3.077	3.090	2.835	2.902	2.795	2.993	2.461-3.524	0.17710	1.496
12 PFHpS	4.044	2.842	3.131	3.104	3.261	3.676	3.545	3.343	3.748	3.501	3.419	2.379-4.459	0.34655	1.709
18 PFOS	3.975	3.515	4.137	3.455	4.195	4.637	4.499	3.908	4.101	4.392	4.081	2.969-5.193	0.37065	2.040
17 PFNA	5.519	4.581	5.276	5.092	4.359	5.096	5.325	5.184	4.919	4.748	5.009	3.951-6.068	0.35270	2.504
19 PFOSA	26.599	37.629	40.752	51.795	31.611	40.160	38.466	37.613	37.764	36.829	37.921	19.381-56.461	6.18003	18.960
16 PFNS	2.695	3.122	3.060	2.820	3.594	2.764	3.044	3.085	3.179	3.185	3.054	1.967-4.141	0.36230	1.527
10 PFDA	8.437	10.459	10.010	11.582	11.680	10.576	11.174	10.324	11.243	11.299	10.678	7.388-13.968	1.09670	5.339
3 8:2 FTS	1.535	1.816	1.808	1.953	1.495	1.682	1.626	1.606	1.726	1.641	1.688	1.256-2.121	0.14411	0.844
6 N-MeFOSAA	1.103	1.529	1.725	1.496	1.504	1.479	1.452	1.432	1.528	1.444	1.469	1.029-1.908	0.14650	0.734
9 PFDS	1.880	3.252	3.669	4.090	3.244	3.256	3.265	3.028	3.109	3.130	3.192	1.569-4.814	0.54085	1.596
25 PFUdA	9.483	9.227	10.840	12.353	10.337	11.818	12.222	11.772	10.836	11.351	11.023	7.486-14.561	1.17910	5.511
5 N-EtFOSAA	1.520	1.539	1.596	1.966	1.651	1.559	1.726	1.787	1.787	1.710	1.684	1.266-2.101	0.13918	0.842
26 MeFOSA	0.777	0.980	1.737	1.363	1.034	1.101	0.965	1.121	1.162	1.032	1.127	0.319-1.935	0.26933	0.563
27 EtFOSA	1.102	0.804	1.193	0.921	1.088	1.064	0.991	1.119	1.132	1.007	1.042	0.682-1.401	0.11975	0.521
11 PFDoA	6.175	7.816	8.444	7.754	8.108	8.486	7.885	7.842	7.919	8.022	7.845	5.401-10.288	0.81446	3.922
4 10:2 FTS	2.673	2.975	3.252	2.420	2.396	2.991	2.753	2.372	2.813	2.643	2.728	1.856-3.600	0.29068	1.364
34 PFDOS	3.804	3.344	3.166	3.508	3.688	3.672	3.435	3.306	3.390	3.491	3.480	2.891-4.068	0.19618	1.740
24 PFTrDA	4.152	3.830	3.565	3.820	3.568	3.630	3.424	3.977	3.744	3.868	3.757	3.136-4.379	0.20726	1.878
23 PFTeDA	10.774	9.484	8.703	9.580	10.812	9.378	9.484	9.776	9.483	9.750	9.722	7.490-11.954	0.74394	4.861
35 PFHxDA	9.000	9.143	8.198	8.255	8.995	8.737	8.499	8.766	9.298	8.681	8.757	7.664-9.850	0.36430	4.378
36 PFODA	100.408	92.517	111.623	102.548	115.272	110.499	103.188	117.324	112.555	122.614	108.854	80.835-136.874	9.33989	54.427

Report Date: 27-Sep-2021 12:16:52 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 01-Sep-2021 13:35:29 Cal End Date: 01-Sep-2021 15:10:37

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b

Level	Cal File	Cal Sample ID	Cal Date
1	090121014.d	ICAL 50_SVLC-1596	01-Sep-2021 13:35:29
2	090121015.d	ICAL 100_SVLC-1597	01-Sep-2021 13:46:02
3	090121016.d	ICAL 200_SVLC-1598	01-Sep-2021 13:56:33
4	090121017.d	ICAL 500_SVLC-1599	01-Sep-2021 14:07:08
5	090121018.d	ICAL 1000_SVLC-1619	01-Sep-2021 14:17:40
6	090121019.d	ICAL 2000_SVLC-1601	01-Sep-2021 14:28:14
7	090121020.d	ICAL 5000_SVLC-1602	01-Sep-2021 14:38:47
8	090121021.d	ICAL 10000_SVLC-1603	01-Sep-2021 14:49:24
9	090121022.d	ICAL 15000_SVLC-1604	01-Sep-2021 15:00:00
10	090121023.d	ICAL 20000_SVLC-1605	01-Sep-2021 15:10:37

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	1343	1293	1302	1191	1397	1258	1180	1242	1222	1156	Avg:A Wt:C2	1258		RSD=6.0	
	106.7	102.7	103.5	94.6	111	100	93.8	98.7	97.1	91.9	Org:N Dep:R				
8 PFBA	1.139709	1.076403	1.093028	1.024546	1.035269	1.076369	1.021441	1.022249	1.002564	0.986423	Avg:A Wt:C2	1.047800		RSD=4.5	
	108.8	102.7	104.3	97.8	98.8	102.7	97.5	97.6	95.7	94.1	Org:N Dep:R				
D 50 13C5_PFPeA	1329	1164	1313	1153	1262	1269	1124	1191	1269	1135	Avg:A Wt:C2	1221		RSD=6.2	
	108.9	95.3	107.6	94.5	103.4	103.9	92	97.6	103.9	93	Org:N Dep:R				
21 PFPeA	1.058344	1.164516	1.066306	1.055064	1.145782	1.002288	1.013589	1.043976	0.919263	0.952897	Avg:A Wt:C2	1.042202		RSD=7.3	
	101.5	111.7	102.3	101.2	109.9	96.2	97.3	100.2	88.2	91.4	Org:N Dep:R				
D 44 13C3_PFBS	430	389	390	377	433	410	365	372	379	367	Avg:A Wt:C2	391		RSD=6.3	
	109.8	99.3	99.7	96.4	110.6	104.9	93.4	95.1	96.9	93.9	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
7 PFBS	1.168691	1.254339	1.158587	1.155724	1.230086	1.221037	1.213776	1.323706	1.285312	1.206573	Avg:A Wt:C2	1.221783		RSD=4.5	
	95.7	102.7	94.8	94.6	100.7	99.9	99.3	108.3	105.2	98.8	Org:N Dep:R				
1 4:2 FTS	1.672996	1.766029	1.569243	1.988261	1.764733	1.744168	1.968123	2.021111	1.632463	1.812947	Avg:A Wt:C2	1.794007		RSD=8.6	
	93.3	98.4	87.5	110.8	98.4	97.2	109.7	112.7	91	101.1	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	75.8362	73.9328	76.1732	71.2404	80.5006	73.5010	65.1074	68.3392	75.3770	68.5104	Avg:A Wt:C2	72.8518		RSD=6.3	
	104.1	101.5	104.6	97.8	110.5	100.9	89.4	93.8	103.5	94	Org:N Dep:R				
D 49 13C5_PFHxA	1094	1133	1045	998	1191	1110	1085	1047	1000	1024	Avg:A Wt:C2	1073		RSD=5.8	
	102	105.6	97.4	93	111	103.4	101.2	97.6	93.2	95.4	Org:N Dep:R				
15 PFHxA	1.001317	1.072020	1.050766	0.980690	1.039821	0.966254	0.883770	0.955827	0.981950	0.888052	Avg:A Wt:C2	0.982047		RSD=6.4	
	102	109.2	107	99.9	105.9	98.4	90	97.3	100	90.4	Org:N Dep:R				
22 PFPeS	0.838001	0.902586	0.982691	0.870223	0.953566	0.894948	0.949900	0.950630	0.934473	0.882566	Avg:A Wt:C2	0.915958		RSD=4.9	
	91.5	98.5	107.3	95	104.1	97.7	103.7	103.8	102	96.4	Org:N Dep:R				
28 GenX	0.956727	1.100630	0.927571	0.966273	0.905926	0.922859	1.080137	0.932520	0.895961	0.968095	Avg:A Wt:C2	0.965670		RSD=7.3	
	99.1	114	96.1	100.1	93.8	95.6	111.9	96.6	92.8	100.3	Org:N Dep:R				
D 66 13C3_GenX	145	150	157	139	162	158	123	139	153	132	Avg:A Wt:C2	146		RSD=8.6	
	99.6	103.1	107.5	95.5	111.3	108	84.2	95.5	104.9	90.4	Org:N Dep:R				
13 PFHpA	0.888641	0.852150	0.981828	0.853497	0.921477	0.865930	0.898316	0.869273	0.821908	0.881694	Avg:A Wt:C2	0.883472		RSD=5.0	
	100.6	96.5	111.1	96.6	104.3	98	101.7	98.4	93	99.8	Org:N Dep:R				
D 47 13C4_PFHpA	1164	1181	1068	1083	1174	1083	1081	1067	1093	1001	Avg:A Wt:C2	1100		RSD=5.2	
	105.9	107.4	97.2	98.5	106.7	98.5	98.3	97	99.4	91	Org:N Dep:R				
D 45 13C3_PFHxS	319	304	334	272	328	298	274	305	280	257	Avg:A Wt:C2	297		RSD=8.7	
	107.5	102.2	112.4	91.5	110.3	100.4	92.1	102.8	94.4	86.5	Org:N Dep:R				
14 PFHxS	1.182651	1.159142	1.250287	1.171949	1.168795	1.152333	1.178942	1.138339	1.219826	1.158319	Avg:A Wt:C2	1.178058		RSD=2.8	
	100.4	98.4	106.1	99.5	99.2	97.8	100.1	96.6	103.5	98.3	Org:N Dep:R				
29 ADONA	6.300840	5.631837	5.634887	6.382516	6.241739	6.061455	6.017549	5.481232	5.952387	5.800244	Avg:A Wt:C2	5.950469		RSD=5.2	
	105.9	94.6	94.7	107.3	104.9	101.9	101.1	92.1	100	97.5	Org:N Dep:R				
2 6:2 FTS	2.313461	2.112275	1.884438	2.249699	2.320387	1.968087	2.377484	1.914382	2.021151	2.164327	Avg:A Wt:C2	2.132569		RSD=8.4	
	108.5	99	88.4	105.5	108.8	92.3	111.5	89.8	94.8	101.5	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	68.7136	65.1806	71.6086	57.8202	68.6076	61.0024	53.8986	57.1418	55.1624	51.9872	Avg:A Wt:C2	61.1123		RSD=11.4	
	112.4	106.7	117.2	94.6	112.3	99.8	88.2	93.5	90.3	85.1	Org:N Dep:R				
D 53 13C8_PFOA	1218	1071	1154	1121	1292	1157	1038	1029	1043	1049	Avg:A Wt:C2	1117		RSD=7.9	
	109	95.9	103.3	100.4	115.7	103.6	92.9	92.1	93.3	93.9	Org:N Dep:R				
20 PFOA	1.087053	1.136938	0.953137	0.995392	1.058354	1.008480	1.012939	1.016475	0.984998	0.916605	Avg:A Wt:C2	1.017037		RSD=6.3	
	106.9	111.8	93.7	97.9	104.1	99.2	99.6	99.9	96.8	90.1	Org:N Dep:R				
12 PFHpS	1.070471	0.952273	0.862734	0.976659	0.967227	1.004180	1.008767	0.903762	1.065033	1.053573	Avg:A Wt:C2	0.986468		RSD=7.0	
	108.5	96.5	87.5	99	98	101.8	102.3	91.6	108	106.8	Org:N Dep:R				
D 54 13C8_PFOS	264	242	270	205	264	271	221	262	213	248	Avg:A Wt:C2	246		RSD=10.1	
	107.2	98.4	109.8	83.3	107.2	110.3	89.8	106.5	86.6	100.8	Org:N Dep:R				
18 PFOS	1.123427	1.064703	1.214484	1.381896	1.270323	1.161001	1.331602	1.072949	1.354702	1.121121	Avg:A Wt:C2	1.209621		RSD=9.8	
	92.9	88	100.4	114.2	105	96	110.1	88.7	112	92.7	Org:N Dep:R				
17 PFNA	0.929894	0.942170	0.885593	0.915450	0.993207	0.816195	0.988444	0.940843	0.855749	0.864160	Avg:A Wt:C2	0.913171		RSD=6.3	
	101.8	103.2	97	100.2	108.8	89.4	108.2	103	93.7	94.6	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 56 13C9_PFNA	1168	1017	1172	980	1109	1151	927	1023	1030	977	Avg:A Wt:C2	1055		RSD=8.3	
	110.6	96.4	111.1	92.9	105.1	109.1	87.8	96.9	97.6	92.6	Org:N Dep:R				
30 9Cl-PF3ONS	3.057083	3.291573	3.309366	3.598402	3.402963	3.040308	3.214145	3.022531	3.657151	2.876721	Avg:A Wt:C2	3.247024		RSD=7.9	
	94.2	101.4	101.9	110.8	104.8	93.6	99	93.1	112.6	88.6	Org:N Dep:R				
D 55 13C8_PFOSA	484	455	493	446	530	498	435	482	476	470	Avg:A Wt:C2	477		RSD=5.8	
	101.5	95.5	103.3	93.5	111.2	104.5	91.1	101.1	99.9	98.5	Org:N Dep:R				
19 PFOSA	1.272708	1.207014	1.162351	1.122966	1.067115	1.045528	1.126162	1.107887	1.087950	1.050515	Avg:A Wt:C2	1.125020		RSD=6.4	
	113.1	107.3	103.3	99.8	94.9	92.9	100.1	98.5	96.7	93.4	Org:N Dep:R				
16 PFNS	0.918256	0.819723	0.889320	0.994546	1.018247	0.850030	0.890933	0.797951	0.963086	0.843443	Avg:A Wt:C2	0.898553		RSD=8.3	
	102.2	91.2	99	110.7	113.3	94.6	99.2	88.8	107.2	93.9	Org:N Dep:R				
D 51 13C6_PFDA	998	898	943	842	1049	1072	881	871	845	765	Avg:A Wt:C2	916		RSD=10.7	
	108.9	98	102.9	91.9	114.5	117	96.1	95.1	92.2	83.5	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	47.8940	47.9086	51.9340	44.9308	53.9158	51.9942	39.8438	41.7670	36.5316	33.3358	Avg:A Wt:C2	45.0056		RSD=15.5	
	106.4	106.5	115.4	99.8	119.8	115.5	88.5	92.8	81.2	74.1	Org:N Dep:R				
10 PFDA	1.006252	1.049470	0.991739	0.955098	0.882250	0.782362	0.924344	0.935081	0.922739	1.014526	Avg:A Wt:C2	0.946386		RSD=8.1	
	106.3	110.9	104.8	100.9	93.2	82.7	97.7	98.8	97.5	107.2	Org:N Dep:R				
3 8:2 FTS	2.235713	2.579939	1.999688	2.005915	1.804387	1.684054	2.052095	1.899148	2.117754	2.222142	Avg:A Wt:C2	2.060083		RSD=12.2	
	108.5	125.2	97.1	97.4	87.6	81.7	99.6	92.2	102.8	107.9	Org:N Dep:R				
D 58 d3-MeFOSAA	250	250	256	246	303	261	244	269	280	258	Avg:A Wt:C2	262		RSD=6.9	
	95.7	95.4	97.7	94.2	115.7	99.7	93.4	102.8	106.9	98.5	Org:N Dep:R				
6 N-MeFOSAA	0.893874	0.923404	1.012925	0.797097	0.723518	0.814894	0.795211	0.747242	0.742573	0.781434	Avg:A Wt:C2	0.823217		RSD=11.2	
	108.6	112.2	123	96.8	87.9	99	96.6	90.8	90.2	94.9	Org:N Dep:R				
9 PFDS	0.788722	0.981377	0.910526	1.279532	1.128269	0.910390	1.032961	0.874902	1.094168	0.861744	Avg:A Wt:C2	0.986259		RSD=15.1	D
	80	99.5	92.3	*129.7	114.4	92.3	104.7	88.7	110.9	87.4	Org:N Dep:R				
D 61 d7-MeFOSE	168	133	148	128	158	140	139	122	133	132	Avg:A Wt:C2	140		RSD=10.1	
	119.8	94.9	105.6	91.5	112.8	99.8	99.4	87.2	94.7	94.2	Org:N Dep:R				
D 60 d5-EtFOSAA	241	245	243	218	266	238	216	215	205	191	Avg:A Wt:C2	228		RSD=9.9	
	105.7	107.6	106.8	95.5	116.6	104.7	94.9	94.4	90	83.8	Org:N Dep:R				
D 52 13C7_PFUdA	857	898	879	739	925	825	782	764	755	762	Avg:A Wt:C2	819		RSD=8.2	
	104.7	109.7	107.4	90.2	113	100.8	95.5	93.4	92.2	93.1	Org:N Dep:R				
32 MeFOSE	Disabled	1.333945	0.985140	0.940804	0.950583	0.984076	0.929308	1.041784	0.936685	0.969141	Ln:A Wt:C2	0.940079	32.2865	R^2=0.993	
	Disabled	107.6	87.6	93.2	97.7	103	98.2	110.5	99.4	102.9	Org:N Dep:R			RSE=7.5	
25 PFUdA	0.906084	0.854493	0.822234	0.984973	0.869292	0.930370	0.964641	0.951039	0.873666	0.888660	Avg:A Wt:C2	0.904545		RSD=5.8	
	100.2	94.5	90.9	108.9	96.1	102.9	106.6	105.1	96.6	98.2	Org:N Dep:R				
5 N-EtFOSAA	1.104001	0.849802	0.990619	1.083181	0.923749	0.902741	0.944435	0.958115	0.958333	0.948417	Avg:A Wt:C2	0.966339		RSD=8.0	
	114.2	87.9	102.5	112.1	95.6	93.4	97.7	99.1	99.2	98.1	Org:N Dep:R				
26 MeFOSA	1.294584	1.028302	1.243414	1.127921	0.999531	1.248135	1.002761	1.075936	1.018701	1.018092	Avg:A Wt:C2	1.105738		RSD=10.4	
	117.1	93	112.5	102	90.4	112.9	90.7	97.3	92.1	92.1	Org:N Dep:R				
D 57 d3-MeFOSA	69.6440	67.7330	83.5080	70.9110	81.0220	64.3480	72.4390	71.5080	75.3350	67.0450	Avg:A Wt:C2	72.3493		RSD=8.4	
	96.3	93.6	115.4	98	112	88.9	100.1	98.8	104.1	92.7	Org:N Dep:R				
31 11Cl-PF3OUDS	2.763848	2.832888	2.707251	3.301027	2.895083	2.565684	2.896735	2.691572	3.317820	2.646981	Avg:A Wt:C2	2.861889		RSD=9.0	
	96.6	99	94.6	115.3	101.2	89.7	101.2	94	115.9	92.5	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 62 d9-EtFOSE	135	142	167	121	137	146	127	138	134	129	Avg:A Wt:C2	138		RSD=9.2	
	98.1	103.4	121.3	87.6	99.7	106.3	92.4	100.4	97.2	93.7	Org:N Dep:R				
33 EtFOSE	0.768593	0.737547	0.589610	0.781332	0.779020	0.694185	0.709306	0.745540	0.706586	0.721282	Avg:A Wt:C2	0.723300		RSD=7.8	
	106.3	102	81.5	108	107.7	96	98.1	103.1	97.7	99.7	Org:N Dep:R				
D 59 d5-EtFOSA	72.1160	66.6460	69.3820	70.2750	67.4630	58.7620	66.1540	76.6910	68.5440	62.2190	Avg:A Wt:C2	67.8252		RSD=7.4	
	106.3	98.3	102.3	103.6	99.5	86.6	97.5	113.1	101.1	91.7	Org:N Dep:R				
27 EtFOSA	1.268235	0.979204	1.171846	0.890530	1.259772	1.253182	1.019633	0.954255	1.081466	1.087386	Avg:A Wt:C2	1.096551		RSD=12.5	
	115.7	89.3	106.9	81.2	114.9	114.3	93	87	98.6	99.2	Org:N Dep:R				
D 38 13C2_PFDoA	979	916	946	885	964	881	832	864	869	851	Avg:A Wt:C2	899		RSD=5.6	
	108.9	101.9	105.3	98.5	107.2	98	92.6	96.2	96.6	94.7	Org:N Dep:R				
11 PFDoA	0.963025	0.966052	0.967261	0.971609	1.012997	0.980596	0.996699	0.915761	0.911749	0.904028	Avg:A Wt:C2	0.958978		RSD=3.8	
	100.4	100.7	100.9	101.3	105.6	102.3	103.9	95.5	95.1	94.3	Org:N Dep:R				
4 10:2 FTS	2.671875	2.808772	2.211952	2.323444	2.212802	2.095979	2.551254	2.248986	2.931260	2.892623	Avg:A Wt:C2	2.494895		RSD=12.6	
	107.1	112.6	88.7	93.1	88.7	84	102.3	90.1	117.5	115.9	Org:N Dep:R				
34 PFDOS	0.859896	0.705187	0.778111	0.919717	0.862707	0.773578	0.851974	0.749041	0.962494	0.801348	Avg:A Wt:C2	0.826405		RSD=9.6	
	104.1	85.3	94.2	111.3	104.4	93.6	103.1	90.6	116.5	97	Org:N Dep:R				
24 PFTrDA	0.500743	0.503805	0.504924	0.482758	0.507507	0.501103	0.500558	0.513118	0.507561	0.500942	Avg:A Wt:C2	0.502302		RSD=1.6	
	99.7	100.3	100.5	96.1	101	99.8	99.7	102.2	101	99.7	Org:N Dep:R				
D 42 13C2_PFTeDA	1090	1022	1058	1015	1116	1006	1012	1011	1066	1038	Avg:A Wt:C2	1043		RSD=3.6	
	104.5	97.9	101.4	97.2	107	96.4	97	96.9	102.2	99.4	Org:N Dep:R				
23 PFTeDA	0.961707	0.907879	0.810874	0.780486	0.879892	0.840808	0.786386	0.828991	0.780968	0.771081	Avg:A Wt:C2	0.834907		RSD=7.6	
	115.2	108.7	97.1	93.5	105.4	100.7	94.2	99.3	93.5	92.4	Org:N Dep:R				
35 PFHxDA	1.318077	1.219749	1.133657	1.101966	1.093759	1.122762	1.094139	1.090286	1.132384	1.078897	Avg:A Wt:C2	1.138567		RSD=6.6	
	115.8	107.1	99.6	96.8	96.1	98.6	96.1	95.8	99.5	94.8	Org:N Dep:R				
D 40 13C2_PFHxDA	528	533	523	468	574	519	470	507	527	505	Avg:A Wt:C2	515		RSD=5.9	
	102.4	103.4	101.4	90.9	111.3	100.7	91.3	98.3	102.2	97.9	Org:N Dep:R				
36 PFODA	0.913360	0.835296	0.905595	0.876796	0.852632	0.877306	0.914843	0.909722	0.818663	0.854355	Avg:A Wt:C2	0.875857		RSD=4.0	
	104.3	95.4	103.4	100.1	97.3	100.2	104.5	103.9	93.5	97.5	Org:N Dep:R				

QC Flag Legend

D - Fails ReadBack

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 01-Sep-2021 13:35:29 Cal End Date: 01-Sep-2021 15:10:37
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b

Level	Cal File	Cal Sample ID	Cal Date
1	090121014.d	ICAL 50_SVLC-1596	01-Sep-2021 13:35:29
2	090121015.d	ICAL 100_SVLC-1597	01-Sep-2021 13:46:02
3	090121016.d	ICAL 200_SVLC-1598	01-Sep-2021 13:56:33
4	090121017.d	ICAL 500_SVLC-1599	01-Sep-2021 14:07:08
5	090121018.d	ICAL 1000_SVLC-1619	01-Sep-2021 14:17:40
6	090121019.d	ICAL 2000_SVLC-1601	01-Sep-2021 14:28:14
7	090121020.d	ICAL 5000_SVLC-1602	01-Sep-2021 14:38:47
8	090121021.d	ICAL 10000_SVLC-1603	01-Sep-2021 14:49:24
9	090121022.d	ICAL 15000_SVLC-1604	01-Sep-2021 15:00:00
10	090121023.d	ICAL 20000_SVLC-1605	01-Sep-2021 15:10:37

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	918983	933769	1131923	796995	1065935	926601	826547	892153	856675	776844	4.19
* 39 13C2_PFHxA	1104279	995982	1065467	928035	1185316	1077812	868822	998018	1036407	1020028	1.98
* 41 13C2_PFOA	1171796	1225357	1182943	1005273	1276193	1161246	1079611	1051950	1075898	1097982	1.62
* 43 13C3_PFBA	1374010	1345648	1355252	1181367	1524435	1297881	1216256	1241746	1278735	1211042	3.15
* 48 13C4_PFOS	278650	270783	268700	244688	323082	261720	252941	253686	258990	242489	3.46

13C2_PFDA ((|776844 - 918983| / (776844 + 918983)) / 2) * 100 = 4.19
13C2_PFHxA ((|1020028 - 1104279| / (1020028 + 1104279)) / 2) * 100= 1.98
13C2_PFOA ((|1097982 - 1171796| / (1097982 + 1171796)) / 2) * 100= 1.63
13C3_PFBA ((|1211042 - 1374010| / (1211042 + 1374010)) / 2) * 100= 3.15
13C4_PFOS ((|242489 - 278650| / (242489 + 278650)) / 2) * 100 = 3.47

Report Date: 27-Sep-2021 12:16:52 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Initial Calibration Response Report

Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 01-Sep-2021 13:35:29 Cal End Date: 01-Sep-2021 15:10:37
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b

Level	Cal File	Cal Sample ID	Cal Date
1	090121014.d	ICAL 50_SVLC-1596	01-Sep-2021 13:35:29
2	090121015.d	ICAL 100_SVLC-1597	01-Sep-2021 13:46:02
3	090121016.d	ICAL 200_SVLC-1598	01-Sep-2021 13:56:33
4	090121017.d	ICAL 500_SVLC-1599	01-Sep-2021 14:07:08
5	090121018.d	ICAL 1000_SVLC-1619	01-Sep-2021 14:17:40
6	090121019.d	ICAL 2000_SVLC-1601	01-Sep-2021 14:28:14
7	090121020.d	ICAL 5000_SVLC-1602	01-Sep-2021 14:38:47
8	090121021.d	ICAL 10000_SVLC-1603	01-Sep-2021 14:49:24
9	090121022.d	ICAL 15000_SVLC-1604	01-Sep-2021 15:00:00
10	090121023.d	ICAL 20000_SVLC-1605	01-Sep-2021 15:10:37

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1342957	1292824	1301865	1190900	1396762	1258160	1180356	1242129	1221844	1156282	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	76529	139160	284595	610066	1446025	2708488	6028323	12697655	18374648	22811658	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1329171	1164132	1313300	1153268	1261998	1268798	1123801	1191066	1268914	1135210	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	70336	135565	280076	608386	1445974	2543401	5695363	12434446	17496990	21634753	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	429823	388696	389986	377280	432892	410434	365395	372202	379111	367473	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	22203	43100	79884	192726	470725	886042	1960304	4355346	6461279	7839014	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	5925	12195	22329	66148	132686	239474	598411	1290051	1723933	2320163	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	379181	369664	380866	356202	402503	367505	325537	341696	376885	342552	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1094339	1132964	1044981	998079	1190951	1109670	1085319	1047229	999570	1023790	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1104279	995982	1065467	928035	1185316	1077812	868822	998018	1036407	1020028	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	54789	121456	219606	489403	1238376	2144446	4795861	10009693	14722918	18183584	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	16893	32908	71895	153981	387198	689087	1627846	3318893	4984566	6084231	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	13905	33124	58236	134713	294239	581982	1326713	2598523	4116857	5110426	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	726696	752387	784792	697075	811984	788287	614141	696640	765818	659856	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	51727	100648	209799	462118	1081385	1876426	4855759	9273627	13472774	17647599	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1164182	1181106	1068410	1082881	1173534	1083475	1081080	1066825	1092805	1000778	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	319305	303597	333730	271688	327704	298107	273670	305258	280313	256777	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	17182	32024	75941	144874	348547	625204	1468017	3162133	4667385	5413220	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	94760	161064	354292	816739	1926807	3404317	7756535	15761448	23576348	28059719	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	7535	13052	25585	61657	150918	227630	607398	1037029	1585410	2133328	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	343568	325903	358043	289101	343038	305012	269493	285709	275812	259936	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1171796	1225357	1182943	1005273	1276193	1161246	1079611	1051950	1075898	1097982	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1217770	1071378	1153628	1121416	1292395	1157354	1038260	1028811	1042962	1049159	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	66189	121809	219913	558124	1367811	2334337	5258470	10457604	15409727	19233295	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	16270	27523	54820	126305	301750	569968	1314090	2626384	4263187	5150956	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	263702	242155	270203	204905	263760	271371	220965	261893	213122	247990	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	278650	270783	268700	244688	323082	261720	252941	253686	258990	242489	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	13746	23926	60906	131385	310936	584755	1365262	2607660	4018939	5160179	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	54295	95860	207644	448622	1101380	1879466	4579438	9621719	13226715	16891503	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1167768	1017438	1172344	980112	1108913	1151359	926595	1022670	1030420	977337	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	37567	74287	166679	343596	836531	1537896	3309595	7377523	10896283	13297738	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	484463	455471	492949	445928	530495	498452	434712	482263	476415	470063	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	30829	54976	114596	250381	566099	1042291	2447780	5342930	7774737	9876162	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	11623	19056	46137	97818	257830	442893	944952	2006186	2955670	4015976	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	997643	898101	942930	842242	1049020	1072198	880818	871203	845110	765327	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	918983	933769	1131923	796995	1065935	926601	826547	892153	856675	776844	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	239470	239543	259670	224654	269579	259971	199219	208835	182658	166679	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	50194	94253	187028	402212	925498	1677694	4070892	8146455	11697243	15528889	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	5129	11841	19898	43171	93199	167767	391646	759902	1111734	1419313	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1251854	1248370	1277735	1232498	1513550	1304854	1221950	1345052	1398221	1288283	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	11190	23055	51770	98242	219016	425327	971708	2010159	3114844	4026833	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	10025	22909	47434	126372	286879	476319	1100156	2208819	3371945	4120211	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	168042	133049	148116	128388	158186	139943	139458	122364	132839	132190	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1203532	1224462	1215351	1087584	1327547	1192380	1080172	1075134	1024830	953793	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	857007	897749	879087	738692	925180	824997	781635	764194	754735	762364	
32 MeFOSE	Disabled	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	Disabled	17748	29183	60394	150369	275429	647997	1274768	1866425	2562216	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	38826	76712	144563	363796	804252	1535105	3769987	7267785	9890789	13549647	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	13287	20811	48158	117805	245264	430564	1020152	2060204	2946384	3618374	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	4508	6965	20767	39991	80984	160630	363195	769380	1151158	1365159	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	69644	67733	83508	70911	81022	64348	72439	71508	75335	67045	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	34328	64621	137816	318583	719318	1311739	3014763	6640194	9991328	12367044	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	135104	142418	167085	120717	137302	146389	127210	138286	133824	129047	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	5192	10504	19703	47160	106961	203242	451154	1030978	1418373	1861586	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	72116	66646	69382	70275	67463	58762	66154	76691	68544	62219	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	4573	6526	16261	31291	84988	147279	337264	731828	1111920	1353122	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	978666	916089	946430	885060	963591	881118	832364	864094	868555	850786	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	47124	88499	183089	429966	976115	1728042	4148082	7913033	11878562	15382683	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	6168	12972	22148	50318	115010	210111	489961	905518	1548429	1859130	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	10975	16530	40704	91212	220266	406418	911161	1898913	2978467	3847343	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	24503	46153	95575	213635	489029	883061	2083231	4433824	6612668	8523892	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1090374	1021733	1058370	1014683	1116045	1006344	1012464	1010705	1066354	1037676	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	52431	92761	171641	395973	981999	1692284	3980937	8378655	12491826	16002635	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	34776	64983	118495	258027	627273	1164836	2573507	5523510	8945021	10888638	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	527678	532757	522623	468303	573502	518737	470417	506611	526619	504619	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	24098	44501	94657	205303	488986	910182	2151789	4608753	6466854	8622478	

Report Date: 27-Sep-2021 12:16:52 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 01-Sep-2021 13:35:29 Cal End Date: 01-Sep-2021 15:10:37

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Batch: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b

Level	Cal File	Cal Sample ID	Cal Date
1	090121014.d	ICAL 50_SVLC-1596	01-Sep-2021 13:35:29
2	090121015.d	ICAL 100_SVLC-1597	01-Sep-2021 13:46:02
3	090121016.d	ICAL 200_SVLC-1598	01-Sep-2021 13:56:33
4	090121017.d	ICAL 500_SVLC-1599	01-Sep-2021 14:07:08
5	090121018.d	ICAL 1000_SVLC-1619	01-Sep-2021 14:17:40
6	090121019.d	ICAL 2000_SVLC-1601	01-Sep-2021 14:28:14
7	090121020.d	ICAL 5000_SVLC-1602	01-Sep-2021 14:38:47
8	090121021.d	ICAL 10000_SVLC-1603	01-Sep-2021 14:49:24
9	090121022.d	ICAL 15000_SVLC-1604	01-Sep-2021 15:00:00
10	090121023.d	ICAL 20000_SVLC-1605	01-Sep-2021 15:10:37

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.721	1.721	1.721	1.721	1.721	1.721	1.721	1.714	1.721	1.721	1.719	0.110
8 PFBA	1.727	1.727	1.727	1.727	1.727	1.721	1.721	1.721	1.721	1.721	1.724	0.214
D 50 13C5_PFPeA	2.110	2.110	2.110	2.110	2.110	2.099	2.110	2.099	2.110	2.108	2.107	0.197
21 PFPeA	2.110	2.110	2.110	2.110	2.110	2.110	2.110	2.099	2.110	2.108	2.108	0.150
D 44 13C3_PFBS	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.162	2.160	2.161	0.029
7 PFBS	2.162	2.162	2.172	2.162	2.162	2.162	2.162	2.162	2.162	2.160	2.162	0.167
1 4:2 FTS	2.450	2.459	2.450	2.450	2.450	2.441	2.450	2.450	2.450	2.448	2.449	0.166
D 63 13C2_4:2 FTS_2	2.441	2.450	2.450	2.450	2.450	2.450	2.450	2.441	2.450	2.448	2.447	0.136
D 49 13C5_PFHxA	2.493	2.502	2.502	2.493	2.493	2.493	2.485	2.485	2.493	2.491	2.493	0.229
* 39 13C2_PFHxA	2.493	2.493	2.493	2.493	2.493	2.485	2.493	2.493	2.493	2.491	2.492	0.114
15 PFHxA	2.485	2.493	2.493	2.493	2.493	2.493	2.493	2.493	2.493	2.491	2.492	0.114
22 PFPeS	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.519	2.528	2.526	2.526	0.107
28 GenX	2.609	2.617	2.617	2.617	2.609	2.609	2.609	2.609	2.617	2.608	2.612	0.157
D 66 13C3_GenX	2.609	2.617	2.617	2.617	2.609	2.609	2.617	2.609	2.609	2.616	2.613	0.158
13 PFHpA	2.880	2.890	2.890	2.881	2.881	2.881	2.881	2.880	2.889	2.888	2.883	0.156
D 47 13C4_PFHpA	2.880	2.890	2.890	2.881	2.881	2.890	2.881	2.880	2.880	2.888	2.883	0.163
D 45 13C3_PFHxS	2.897	2.905	2.906	2.899	2.899	2.899	2.899	2.897	2.897	2.904	2.900	0.126
14 PFHxS	2.905	2.897	2.906	2.899	2.899	2.899	2.899	2.897	2.897	2.904	2.900	0.121
29 ADONA	2.920	2.927	2.928	2.921	2.921	2.921	2.928	2.927	2.927	2.927	2.924	0.100
2 6:2 FTS	3.258	3.252	3.246	3.255	3.253	3.248	3.246	3.252	3.246	3.252	3.250	0.127
D 64 13C2_6:2 FTS_2	3.252	3.252	3.253	3.248	3.253	3.248	3.253	3.252	3.246	3.252	3.250	0.075
* 41 13C2_PFOA	3.278	3.278	3.279	3.274	3.272	3.274	3.272	3.278	3.272	3.278	3.275	0.091
D 53 13C8_PFOA	3.278	3.278	3.272	3.274	3.272	3.274	3.272	3.272	3.272	3.278	3.274	0.090
20 PFOA	3.278	3.285	3.285	3.274	3.272	3.281	3.272	3.278	3.278	3.278	3.278	0.135
12 PFHpS	3.285	3.285	3.285	3.281	3.279	3.287	3.279	3.278	3.285	3.285	3.282	0.102
D 54 13C8_PFOS	3.657	3.658	3.658	3.655	3.651	3.647	3.658	3.643	3.658	3.650	3.653	0.151
* 48 13C4_PFOS	3.657	3.658	3.658	3.655	3.651	3.655	3.651	3.650	3.658	3.658	3.654	0.090
18 PFOS	3.657	3.665	3.658	3.655	3.651	3.655	3.651	3.650	3.650	3.658	3.654	0.128
17 PFNA	3.657	3.665	3.658	3.662	3.658	3.662	3.658	3.658	3.665	3.665	3.660	0.085
D 56 13C9_PFNA	3.665	3.658	3.658	3.662	3.666	3.662	3.666	3.665	3.658	3.665	3.662	0.094
30 9Cl-PF3ONS	3.866	3.866	3.861	3.863	3.861	3.863	3.869	3.866	3.859	3.866	3.864	0.081
D 55 13C8_PFOSA	3.911	3.911	3.914	3.908	3.906	3.908	3.906	3.911	3.911	3.911	3.910	0.062

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
19 PFOSA	3.911	3.911	3.906	3.908	3.906	3.908	3.914	3.911	3.911	3.911	3.910	0.062
16 PFNS	4.004	4.004	3.998	4.000	3.997	4.000	3.997	3.994	3.994	4.004	3.999	0.092
D 51 13C6_PFDA	4.013	4.014	4.008	4.010	4.007	4.010	4.017	4.014	4.014	4.014	4.011	0.076
* 37 13C2_PFDA	4.013	4.014	4.017	4.010	4.007	4.010	4.017	4.004	4.014	4.014	4.011	0.106
D 65 13C2_8:2 FTS_2	4.004	4.004	3.998	4.010	4.007	4.000	4.007	4.004	4.014	4.014	4.006	0.132
10 PFDA	4.013	4.014	4.008	4.010	4.007	4.010	4.007	4.014	4.014	4.014	4.010	0.071
3 8:2 FTS	4.004	4.004	4.008	4.010	4.017	4.000	4.007	4.004	4.004	4.004	4.005	0.114
D 58 d3-MeFOSAA	4.169	4.169	4.164	4.167	4.164	4.167	4.164	4.169	4.169	4.169	4.166	0.052
6 N-MeFOSAA	4.169	4.177	4.181	4.167	4.172	4.175	4.172	4.169	4.169	4.177	4.172	0.111
9 PFDS	4.302	4.311	4.298	4.300	4.307	4.300	4.297	4.302	4.302	4.302	4.302	0.096
D 61 d7-MeFOSE	4.321	4.311	4.316	4.310	4.316	4.319	4.316	4.312	4.311	4.312	4.314	0.084
D 60 d5-EtFOSAA	4.330	4.330	4.326	4.319	4.325	4.328	4.325	4.330	4.321	4.330	4.326	0.099
D 52 13C7_PFUdA	4.321	4.330	4.326	4.319	4.325	4.319	4.325	4.321	4.321	4.321	4.322	0.091
32 MeFOSE	Disabled	4.321	4.326	4.319	4.325	4.328	4.325	4.321	4.330	4.321	4.323	0.091
25 PFUdA	4.321	4.321	4.326	4.319	4.325	4.328	4.316	4.321	4.321	4.321	4.321	0.088
5 N-EtFOSAA	4.330	4.330	4.326	4.328	4.334	4.328	4.334	4.339	4.330	4.339	4.332	0.111
26 MeFOSA	4.339	4.339	4.344	4.337	4.334	4.337	4.334	4.339	4.339	4.339	4.338	0.066
D 57 d3-MeFOSA	4.330	4.339	4.326	4.337	4.334	4.337	4.334	4.339	4.339	4.339	4.335	0.111
31 11Cl-PF3OUDS	4.465	4.465	4.462	4.464	4.461	4.464	4.461	4.457	4.457	4.457	4.461	0.071
D 62 d9-EtFOSE	4.481	4.473	4.470	4.480	4.478	4.480	4.478	4.473	4.481	4.482	4.477	0.095
33 EtFOSE	4.489	4.490	4.486	4.488	4.486	4.488	4.486	4.490	4.490	4.490	4.488	0.038
D 59 d5-EtFOSA	4.498	4.498	4.494	4.497	4.494	4.496	4.502	4.498	4.498	4.498	4.497	0.053
27 EtFOSA	4.506	4.498	4.503	4.505	4.502	4.505	4.502	4.506	4.506	4.506	4.503	0.058
D 38 13C2_PFDoA	4.601	4.601	4.598	4.600	4.598	4.600	4.590	4.594	4.601	4.594	4.597	0.083
11 PFDoA	4.593	4.601	4.598	4.592	4.598	4.600	4.598	4.594	4.601	4.594	4.596	0.075
4 10:2 FTS	4.609	4.609	4.614	4.608	4.613	4.607	4.613	4.609	4.616	4.609	4.610	0.071
34 PFDOS	4.816	4.817	4.815	4.811	4.814	4.816	4.809	4.811	4.811	4.812	4.813	0.054
24 PFTrDA	4.842	4.842	4.846	4.842	4.840	4.842	4.845	4.842	4.842	4.848	4.843	0.046
D 42 13C2_PFTeDA	5.071	5.065	5.074	5.065	5.068	5.071	5.068	5.065	5.065	5.072	5.068	0.062
23 PFTeDA	5.071	5.065	5.067	5.071	5.068	5.065	5.068	5.071	5.065	5.072	5.068	0.056
35 PFHxDA	5.496	5.489	5.492	5.489	5.486	5.496	5.486	5.489	5.489	5.489	5.490	0.069
D 40 13C2_PFHxDA	5.482	5.489	5.492	5.489	5.486	5.489	5.486	5.482	5.489	5.489	5.487	0.068
36 PFODA	5.917	5.924	5.920	5.921	5.914	5.917	5.914	5.917	5.917	5.921	5.918	0.057

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b\090121032.d
Injection Date: 01-Sep-2021 16:46:15 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1629 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1396762	1137572			81.4	50 - 150
8 PFBA			500.00	474.10	94.8	70 - 130
21 PFPeA			500.00	462.32	92.5	70 - 130
D 50 13C5_PFPeA	1261998	1076122			85.3	50 - 150
7 PFBS			442.50	409.26	92.5	70 - 130
D 44 13C3_PFBS	432892	354736			81.9	50 - 150
D 63 13C2_4:2 FTS_2	402503	343881			85.4	50 - 150
1 4:2 FTS			467.50	441.08	94.3	70 - 130
D 49 13C5_PFHxA	1190951	972846			81.7	50 - 150
15 PFHxA			500.00	471.85	94.4	70 - 130
22 PFPeS			470.00	461.36	98.2	70 - 130
28 GenX			2500.00	2345.70	93.8	70 - 130
D 66 13C3_GenX	811984	655419			80.7	50 - 150
D 47 13C4_PFHpA	1173534	980976			83.6	50 - 150
13 PFHpA			500.00	453.86	90.8	70 - 130
14 PFHxS			456.00	392.74	86.1	70 - 130
D 45 13C3_PFHxS	327704	282857			86.3	50 - 150
29 ADONA			2355.00	1943.69	82.5	70 - 130
D 64 13C2_6:2 FTS_2	343038	244970			71.4	50 - 150
2 6:2 FTS			475.00	495.84	104.4	70 - 130
D 53 13C8_PFOA	1292395	1004111			77.7	50 - 150
20 PFOA			500.00	460.56	92.1	70 - 130
12 PFHpS			475.00	421.69	88.8	70 - 130
D 54 13C8_PFOS	263760	230132			87.3	50 - 150
18 PFOS			462.75	428.38	92.6	70 - 130
17 PFNA			500.00	457.04	91.4	70 - 130
D 56 13C9_PFNA	1108913	975850			88	50 - 150
30 9Cl-PF3ONS			2330.00	1962.91	84.2	70 - 130
19 PFOSA			500.00	465.57	93.1	70 - 130
D 55 13C8_PFOSA	530495	417536			78.7	50 - 150
16 PFNS			480.00	473.43	98.6	70 - 130
D 51 13C6_PFDA	1049020	795842			75.9	50 - 150
D 65 13C2_8:2 FTS_2	269579	208504			77.3	50 - 150
10 PFDA			500.00	478.76	95.8	70 - 130
3 8:2 FTS			480.00	433.08	90.2	70 - 130
D 58 d3-MeFOSAA	1513550	1244755			82.2	50 - 150

Report Date: 27-Sep-2021 12:16:22 AIM Revision: 2.0.2021.0812
Data File: \\organics\LL\LCMSMS01.i\090121-DOD+ICAL-R.b\090121032.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	463.91	92.8	70 - 130
9 PFDS			482.50	462.28	95.8	70 - 130
D 61 d7-MeFOSE	158186	127915			80.9	50 - 150
25 PFUdA			500.00	480.80	96.2	70 - 130
D 60 d5-EtFOSAA	1327547	1106553			83.4	50 - 150
D 52 13C7_PFUdA	925180	817061			88.3	50 - 150
D 57 d3-MeFOSA	81022	63014			77.8	50 - 150
5 N-EtFOSAA			500.00	545.56	109.1	70 - 130
31 11Cl-PF3OUDS			2355.00	2082.25	88.4	70 - 130
D 62 d9-EtFOSE	137302	116059			84.5	50 - 150
D 59 d5-EtFOSA	67463	58136			86.2	50 - 150
D 38 13C2_PFDoA	963591	843720			87.6	50 - 150
11 PFDoA			500.00	474.93	95	70 - 130
4 10:2 FTS			2410.00	2283.54	94.8	70 - 130
24 PFTrDA			500.00	462.99	92.6	70 - 130
23 PFTeDA			500.00	517.10	103.4	70 - 130
D 42 13C2_PFTeDA	1116045	932963			83.6	50 - 150
D 40 13C2_PFHxDA	573502	479965			83.7	50 - 150

Pace Environmental Services, LLC
Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 15-Sep-2021 14:39:12 Cal End Date: 15-Sep-2021 16:14:22
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	091521016.d	ICAL 50_SVLC-1639	15-Sep-2021 14:39:12
2	091521017.d	ICAL 100_SVLC-1640	15-Sep-2021 14:49:45
3	091521018.d	ICAL 200_SVLC-1641	15-Sep-2021 15:00:16
4	091521019.d	ICAL 500_SVLC-1642	15-Sep-2021 15:10:50
5	091521020.d	ICAL 1000_SVLC-1638	15-Sep-2021 15:21:23
6	091521021.d	ICAL 2000_SVLC-1643	15-Sep-2021 15:31:58
7	091521022.d	ICAL 5000_SVLC-1644	15-Sep-2021 15:42:31
8	091521023.d	ICAL 10000_SVLC-1645	15-Sep-2021 15:53:08
9	091521024.d	ICAL 15000_SVLC-1646	15-Sep-2021 16:03:44
10	091521025.d	ICAL 20000_SVLC-1647	15-Sep-2021 16:14:22

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	Avg. +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	2.884	3.622	3.679	3.704	3.910	3.832	3.450	3.621	3.595	3.483	3.578	2.765-4.390	0.27071	1.789
1 4:2 FTS	1.587	1.080	1.239	1.415	1.631	1.701	1.511	1.557	1.585	1.632	1.493	0.816-2.171	0.22576	0.746
15 PFHxA	15.193	15.021	17.351	20.311	16.772	16.828	15.599	18.214	16.711	15.863	16.786	12.169-21.402	1.53885	8.393
22 PFPeS	2.887	3.137	3.258	3.256	3.031	3.088	3.439	3.473	3.271	3.325	3.216	2.631-3.801	0.19494	1.608
28 GenX	1.025	0.840	0.684	0.845	0.790	0.799	0.811	0.800	0.771	0.771	0.813	0.563-1.064	0.08350	0.406
13 PFHpA	2.985	2.842	3.783	3.393	3.160	3.254	3.292	3.403	3.000	3.307	3.241	2.122-4.361	0.37308	1.620
14 PFHxS	3.595	3.285	3.217	3.560	3.367	3.345	3.499	3.390	3.236	3.381	3.387	3.004-3.770	0.12781	1.693
29 ADONA	2.931	2.672	2.691	2.465	2.580	2.555	2.558	2.464	2.518	2.364	2.579	2.096-3.062	0.16103	1.289
2 6:2 FTS	Disabled	1.692	1.812	1.782	1.538	1.606	1.620	1.679	1.573	1.671	1.663	1.400-1.927	0.08788	0.831
20 PFOA	2.811	2.695	2.779	2.738	2.836	2.823	2.627	2.633	2.728	2.752	2.742	1.987-3.497	0.25172	1.371
12 PFHpS	2.976	3.001	3.310	3.614	3.558	3.376	3.565	3.426	3.468	3.422	3.371	2.715-4.027	0.21872	1.685
18 PFOS	3.776	4.392	2.977	4.262	4.214	3.978	4.118	4.087	3.979	4.320	4.010	2.788-5.232	0.40732	2.005
17 PFNA	5.648	5.375	4.789	4.825	4.942	5.007	4.799	5.169	5.059	4.894	5.050	4.246-5.855	0.26817	2.525
19 PFOSA	40.359	31.716	33.307	41.124	39.723	41.188	34.465	38.746	40.131	37.731	37.849	26.424-49.273	3.80816	18.924
16 PFNS	2.810	3.663	2.694	3.103	3.143	3.242	3.024	3.213	3.587	3.356	3.183	2.308-4.058	0.29151	1.591
3 8:2 FTS	2.052	1.599	1.628	1.549	1.592	1.651	1.849	1.601	1.537	1.622	1.668	1.166-2.169	0.16705	0.834
10 PFDA	8.127	15.629	10.877	9.441	10.945	10.777	11.488	10.753	10.292	10.498	10.882	5.357-16.407	1.84165	5.441
6 N-MeFOSAA	1.486	1.458	1.801	1.531	1.563	1.438	1.436	1.464	1.518	1.379	1.507	1.142-1.872	0.12155	0.753
9 PFDS	2.754	1.976	3.316	3.231	3.185	3.036	3.038	3.624	3.223	3.055	3.043	1.728-4.359	0.43851	1.521
25 PFUdA	9.231	10.656	8.683	10.055	12.386	9.720	10.668	10.694	10.629	10.197	10.291	7.370-13.212	0.97366	5.145
5 N-EtFOSAA	1.677	1.550	1.606	1.686	1.726	1.656	1.565	1.616	1.713	1.665	1.646	1.436-1.855	0.06993	0.823
26 MeFOSA	Disabled	0.779	1.270	1.006	1.252	0.982	1.077	1.153	1.283	1.154	1.106	0.589-1.622	0.17223	0.553
27 EtFOSA	0.832	1.019	1.085	1.040	0.911	1.125	1.078	1.059	1.083	1.064	1.029	0.741-1.317	0.09593	0.514
11 PFDoA	8.899	7.241	8.010	9.762	7.971	7.362	8.255	7.945	7.654	7.730	8.082	5.915-10.249	0.72234	4.041
4 10:2 FTS	2.088	2.282	2.229	2.780	2.198	2.444	2.535	2.501	2.582	2.600	2.423	1.803-3.044	0.20672	1.211
34 PFDOS	3.016	3.006	3.182	3.391	3.195	3.329	3.444	3.304	3.392	3.430	3.268	2.758-3.779	0.17022	1.634
24 PFTrDA	4.269	4.227	4.502	4.121	4.234	4.343	4.393	4.268	4.544	4.487	4.338	3.871-4.806	0.15583	2.169
23 PFTeDA	9.007	9.425	10.161	10.161	9.375	10.711	10.523	9.683	9.751	9.363	9.816	8.142-11.489	0.55789	4.908
35 PFHxDA	13.960	14.491	13.296	12.306	12.957	12.817	12.914	13.423	12.251	12.672	13.108	10.920-15.296	0.72932	6.554
36 PFODA	109.340	134.973	110.849	130.768	121.540	119.366	128.253	137.750	127.545	126.342	124.672	05.451-153.893	9.74032	62.336

Report Date: 17-Sep-2021 11:28:50 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 15-Sep-2021 14:39:12 Cal End Date: 15-Sep-2021 16:14:22
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	091521016.d	ICAL 50_SVLC-1639	15-Sep-2021 14:39:12
2	091521017.d	ICAL 100_SVLC-1640	15-Sep-2021 14:49:45
3	091521018.d	ICAL 200_SVLC-1641	15-Sep-2021 15:00:16
4	091521019.d	ICAL 500_SVLC-1642	15-Sep-2021 15:10:50
5	091521020.d	ICAL 1000_SVLC-1638	15-Sep-2021 15:21:23
6	091521021.d	ICAL 2000_SVLC-1643	15-Sep-2021 15:31:58
7	091521022.d	ICAL 5000_SVLC-1644	15-Sep-2021 15:42:31
8	091521023.d	ICAL 10000_SVLC-1645	15-Sep-2021 15:53:08
9	091521024.d	ICAL 15000_SVLC-1646	15-Sep-2021 16:03:44
10	091521025.d	ICAL 20000_SVLC-1647	15-Sep-2021 16:14:22

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area
Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None
Org: Origin, F-Force, I-Include, N-Neither
Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	1180	1133	1148	1130	1193	1145	1060	1032	1110	1053	Avg:A Wt:C2	1119		RSD=4.9	
	105.5	101.3	102.6	101.1	106.7	102.4	94.8	92.3	99.3	94.1	Org:N Dep:R				
8 PFBA	1.166796	1.174103	1.147959	1.167627	1.133589	1.153745	1.150070	1.099998	1.073808	1.034705	Avg:A Wt:C2	1.130240		RSD=4.1	
	103.2	103.9	101.6	103.3	100.3	102.1	101.8	97.3	95	91.5	Org:N Dep:R				
D 50 13C5_PFPeA	1101	1032	1120	1112	1164	1159	1004	1064	1032	1064	Avg:A Wt:C2	1085		RSD=5.1	
	101.5	95.1	103.2	102.5	107.3	106.8	92.5	98	95.1	98	Org:N Dep:R				
21 PFPeA	1.230958	1.209240	1.097032	1.166322	1.102857	1.104120	1.114068	1.015329	1.105816	1.011188	Avg:A Wt:C2	1.115693		RSD=6.4	
	110.3	108.4	98.3	104.5	98.8	99	99.9	91	99.1	90.6	Org:N Dep:R				
D 44 13C3_PFBS	352	364	369	361	376	363	334	323	354	342	Avg:A Wt:C2	354		RSD=4.6	
	99.4	103	104.3	101.9	106.2	102.5	94.4	91.5	100.2	96.6	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
7 PFBS	2.355421	1.728954	1.447206	1.418988	1.340237	1.421616	1.244534	1.393537	1.292834	1.300436	Ln:A Wt:C2	1.300168	44.1149	R^2=0.996	
	104.4	94.6	92.1	101.5	99.2	107.4	95	106.8	99.2	99.8	Org:N Dep:R			RSE=5.5	
1 4:2 FTS	2.376774	1.977328	2.143233	1.960979	1.909830	2.149268	2.043481	1.727207	1.916320	1.886161	Avg:A Wt:C2	2.009058		RSD=8.9	
	118.3	98.4	106.7	97.6	95.1	107	101.7	86	95.4	93.9	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	62.3990	62.9892	59.1224	61.1306	65.5596	60.3928	56.0704	62.9962	60.2464	63.5170	Avg:A Wt:C2	61.4424		RSD=4.3	
	101.6	102.5	96.2	99.5	106.7	98.3	91.3	102.5	98.1	103.4	Org:N Dep:R				
D 49 13C5_PFHxA	1065	1005	944	958	1063	1028	943	914	940	958	Avg:A Wt:C2	982		RSD=5.5	
	108.5	102.4	96.1	97.6	108.3	104.7	96.1	93.1	95.8	97.6	Org:N Dep:R				
15 PFHxA	1.181161	1.113564	1.134706	1.203582	1.008612	1.016840	0.954938	1.037474	1.064097	0.921516	Avg:A Wt:C2	1.063649		RSD=8.8	
	111	104.7	106.7	113.2	94.8	95.6	89.8	97.5	100	86.6	Org:N Dep:R				
22 PFPeS	1.172076	1.029300	1.022796	1.004904	0.939184	0.981596	0.994146	1.040540	1.008406	0.993598	Avg:A Wt:C2	1.018655		RSD=6.0	
	115.1	101	100.4	98.7	92.2	96.4	97.6	102.1	99	97.5	Org:N Dep:R				
28 GenX	1.242320	0.998664	1.096582	0.953353	0.844843	0.929734	0.835132	0.822000	0.887841	0.905375	Ln:A Wt:C2	0.881184	36.1802	R^2=0.994	
	99.9	92.8	114.2	104.1	93.8	104.5	94.4	93.1	100.6	102.6	Org:N Dep:R			RSE=7.2	
D 66 13C3_GenX	151	164	130	151	168	160	155	163	152	145	Avg:A Wt:C2	154		RSD=7.0	
	97.8	106.6	84.7	98.3	109	103.7	100.9	105.6	98.9	94.5	Org:N Dep:R				
13 PFHpA	0.894362	0.941590	1.023869	0.936976	1.002001	1.058544	1.030059	0.893391	0.906966	0.870187	Avg:A Wt:C2	0.955794		RSD=7.0	
	93.6	98.5	107.1	98	104.8	110.8	107.8	93.5	94.9	91	Org:N Dep:R				
D 47 13C4_PFHpA	1095	1025	1054	1066	1056	976	915	975	982	998	Avg:A Wt:C2	1014		RSD=5.4	
	107.9	101.1	103.9	105.1	104.1	96.2	90.2	96.1	96.8	98.4	Org:N Dep:R				
D 45 13C3_PFHxS	275	280	289	285	309	273	245	255	270	255	Avg:A Wt:C2	274		RSD=6.9	
	100.4	102.5	105.5	104.3	112.8	100	89.5	93.1	98.5	93.2	Org:N Dep:R				
14 PFHxS	1.356448	1.236652	1.228693	1.158381	1.124644	1.223751	1.305913	1.229570	1.128812	1.211823	Avg:A Wt:C2	1.220468		RSD=6.0	
	111.1	101.3	100.7	94.9	92.1	100.3	107	100.7	92.5	99.3	Org:N Dep:R				
29 ADONA	7.595067	6.363060	6.326350	6.535972	6.074284	6.505974	6.907214	6.238508	6.118727	5.835767	Avg:A Wt:C2	6.450092		RSD=7.7	
	117.8	98.7	98.1	101.3	94.2	100.9	107.1	96.7	94.9	90.5	Org:N Dep:R				
2 6:2 FTS	Disabled	3.824168	2.497386	2.282166	1.892031	2.223598	2.177989	1.967020	1.820205	1.914987	Ln:A Wt:C	1.912928	170	R^2=0.996	P
	Disabled	106.4	83.8	100.6	89.6	111.6	112	101.9	94.5	99.6	Org:N Dep:R			RSE=10.2	
D 64 13C2_6:2 FTS_2	70.2212	64.1738	68.1092	67.2246	72.3142	64.7516	59.5112	59.9740	64.7798	59.4674	Avg:A Wt:C2	65.0527		RSD=6.9	
	107.9	98.6	104.7	103.3	111.2	99.5	91.5	92.2	99.6	91.4	Org:N Dep:R				
D 53 13C8_PFOA	1026	1031	1089	1088	1095	1051	991	972	952	975	Avg:A Wt:C2	1027		RSD=5.2	
	99.9	100.4	106	105.9	106.6	102.4	96.5	94.7	92.7	94.9	Org:N Dep:R				
20 PFOA	1.174301	1.154851	1.079214	1.087647	1.079250	1.087563	1.047404	0.955041	1.040916	1.003030	Avg:A Wt:C2	1.070922		RSD=6.1	
	109.7	107.8	100.8	101.6	100.8	101.6	97.8	89.2	97.2	93.7	Org:N Dep:R				
12 PFHpS	1.032418	1.011201	1.058811	1.105664	1.008398	1.126564	1.138686	1.042969	1.030460	1.030516	Avg:A Wt:C2	1.058569		RSD=4.5	
	97.5	95.5	100	104.4	95.3	106.4	107.6	98.5	97.3	97.3	Org:N Dep:R				
D 54 13C8_PFOS	237	222	228	236	266	235	223	206	229	237	Avg:A Wt:C2	232		RSD=6.6	
	102.4	95.6	98.2	101.9	114.5	101.5	96.3	88.8	98.7	102	Org:N Dep:R				
18 PFOS	1.421348	1.480992	1.231995	1.233616	1.176353	1.271267	1.210824	1.319621	1.281148	1.189194	Avg:A Wt:C2	1.281636		RSD=7.8	
	110.9	115.6	96.1	96.3	91.8	99.2	94.5	103	100	92.8	Org:N Dep:R				
17 PFNA	0.957713	1.080806	0.960124	0.888715	0.915588	0.972897	0.955324	0.890022	0.921770	0.873012	Avg:A Wt:C2	0.941597		RSD=6.4	
	101.7	114.8	102	94.4	97.2	103.3	101.5	94.5	97.9	92.7	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 56 13C9_PFNA	1114	1002	1024	1113	1088	1012	943	951	964	950	Avg:A Wt:C2	1016		RSD=6.6	
	109.6	98.6	100.8	109.5	107.1	99.6	92.8	93.6	94.8	93.5	Org:N Dep:R				
30 9Cl-PF3ONS	3.398638	3.213467	3.759797	3.235376	2.992581	3.354086	3.263200	3.302738	3.261916	3.058752	Avg:A Wt:C2	3.284055		RSD=6.3	
	103.5	97.9	114.5	98.5	91.1	102.1	99.4	100.6	99.3	93.1	Org:N Dep:R				
D 55 13C8_PFOSA	445	443	451	515	523	476	400	435	432	443	Avg:A Wt:C2	456		RSD=8.3	
	97.4	97.1	99	112.9	114.6	104.3	87.7	95.3	94.8	97	Org:N Dep:R				
19 PFOSA	1.107679	1.077969	1.046453	0.985234	1.092240	1.018974	1.185240	1.075502	1.142454	1.076822	Avg:A Wt:C2	1.080857		RSD=5.3	
	102.5	99.7	96.8	91.2	101.1	94.3	109.7	99.5	105.7	99.6	Org:N Dep:R				
16 PFNS	0.862154	1.026565	0.959406	0.977288	0.858998	1.002247	0.884155	1.003224	1.021081	0.888948	Avg:A Wt:C2	0.948406		RSD=7.1	
	90.9	108.2	101.2	103	90.6	105.7	93.2	105.8	107.7	93.7	Org:N Dep:R				
D 51 13C6_PFDA	881	835	994	861	921	936	750	825	796	686	Avg:A Wt:C2	849		RSD=10.7	
	103.8	98.4	117.1	101.5	108.6	110.3	88.4	97.2	93.8	80.9	Org:N Dep:R				
3 8:2 FTS	2.605075	2.170394	1.855644	1.571564	1.556266	1.903441	2.109761	1.712630	1.651328	1.820439	Ln:A Wt:C	1.771634	30.5298	R^2=0.993	
	111.1	104.5	95.7	85.1	86	106.5	118.7	96.5	93.1	102.7	Org:N Dep:R			RSE=11.4	
10 PFDA	1.053516	1.217034	0.955501	0.921339	0.955235	0.988039	1.151983	0.872231	1.047192	1.076524	Avg:A Wt:C2	1.023859		RSD=10.4	
	102.9	118.9	93.3	90	93.3	96.5	112.5	85.2	102.3	105.1	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	44.4852	43.7468	45.0496	56.8746	50.8202	46.4994	39.1086	40.0370	39.2580	34.3220	Avg:A Wt:C2	44.0201		RSD=14.7	
	101.1	99.4	102.3	129.2	115.4	105.6	88.8	91	89.2	78	Org:N Dep:R				
D 58 d3-MeFOSAA	253	282	220	253	270	256	249	253	277	252	Avg:A Wt:C2	256		RSD=6.7	
	98.8	109.9	85.6	98.6	105.1	100	97.2	98.7	107.9	98.1	Org:N Dep:R				
6 N-MeFOSAA	0.882335	0.735487	0.928280	0.822682	0.759453	0.819283	0.770869	0.739061	0.739159	0.790950	Avg:A Wt:C2	0.798756		RSD=8.2	
	110.5	92.1	116.2	103	95.1	102.6	96.5	92.5	92.5	99	Org:N Dep:R				
9 PFDS	1.097779	0.850618	1.120753	1.017289	0.874827	0.999406	0.946472	1.123983	1.026426	0.959302	Avg:A Wt:C2	1.001685		RSD=9.6	
	109.6	84.9	111.9	101.6	87.3	99.8	94.5	112.2	102.5	95.8	Org:N Dep:R				
D 61 d7-MeFOSE	134	133	136	127	141	138	127	123	126	132	Avg:A Wt:C2	132		RSD=4.4	
	101.7	101.3	103.2	96.3	106.9	105	96.2	93.6	95.5	100.3	Org:N Dep:R				
32 MeFOSE	1.013737	1.014739	1.141911	1.036446	1.030003	0.905517	1.096002	0.949862	1.009610	0.994922	Avg:A Wt:C2	1.019275		RSD=6.5	
	99.5	99.6	112	101.7	101.1	88.8	107.5	93.2	99.1	97.6	Org:N Dep:R				
25 PFUdA	1.089487	0.967099	0.952732	0.947292	1.026113	0.784910	0.964667	0.898867	0.978092	0.884960	Avg:A Wt:C2	0.949422		RSD=8.6	
	114.8	101.9	100.3	99.8	108.1	82.7	101.6	94.7	103	93.2	Org:N Dep:R				
D 60 d5-EtFOSAA	241	233	235	230	240	232	213	191	192	180	Avg:A Wt:C2	219		RSD=10.5	
	110.1	106.6	107.5	105	109.9	106	97.5	87.4	87.9	82.2	Org:N Dep:R				
D 52 13C7_PFUdA	844	835	848	839	831	869	753	739	721	686	Avg:A Wt:C2	796		RSD=8.1	
	105.9	104.9	106.4	105.3	104.4	109.1	94.5	92.8	90.6	86.1	Org:N Dep:R				
5 N-EtFOSAA	1.326506	1.071142	1.009048	1.036007	0.999896	1.018006	0.939674	0.966699	1.077197	1.086387	Avg:A Wt:C2	1.053056		RSD=10.2	
	126	101.7	95.8	98.4	95	96.7	89.2	91.8	102.3	103.2	Org:N Dep:R				
26 MeFOSA	Disabled	0.926928	1.402726	1.001299	1.102590	0.979477	1.077761	0.961294	1.122426	0.968618	Ln:A Wt:C	1.021962	18.2622	R^2=0.994	
	Disabled	72.8	128.3	94.4	106.1	94.9	105.1	93.9	109.7	94.7	Org:N Dep:R			RSE=16.1	
D 57 d3-MeFOSA	70.2430	65.5930	62.4320	73.8780	71.2250	66.0950	62.0160	69.9070	65.4790	70.7380	Avg:A Wt:C2	67.7606		RSD=5.9	
	103.7	96.8	92.1	109	105.1	97.5	91.5	103.2	96.6	104.4	Org:N Dep:R				
31 11Cl-PF3OUDS	2.771739	3.318407	3.063841	2.678102	2.569980	2.990542	2.629240	3.067268	2.975615	2.693476	Avg:A Wt:C2	2.875821		RSD=8.4	
	96.4	115.4	106.5	93.1	89.4	104	91.4	106.7	103.5	93.7	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 62 d9-EtFOSE	124	129	118	119	130	124	120	125	135	130	Avg:A Wt:C2	126		RSD=4.5	
	98.8	102.8	94.2	94.6	103.6	99	95.9	99.6	107.9	103.8	Org:N Dep:R				
33 EtFOSE	1.007991	1.056394	0.948263	0.855946	0.872620	0.864258	0.839764	0.774893	0.791911	0.792603	Avg:A Wt:C2	0.880464		RSD=10.8	
	114.5	120	107.7	97.2	99.1	98.2	95.4	88	89.9	90	Org:N Dep:R				
D 59 d5-EtFOSA	59.4970	60.1230	59.6040	60.6660	64.9230	64.0240	60.8600	55.0680	62.6400	63.4590	Avg:A Wt:C2	61.0864		RSD=4.7	
	97.4	98.4	97.6	99.3	106.3	104.8	99.6	90.1	102.5	103.9	Org:N Dep:R				
27 EtFOSA	1.215523	1.201204	1.223324	1.171859	1.075366	1.163860	1.094650	1.168000	1.136467	1.080799	Avg:A Wt:C2	1.153105		RSD=4.7	
	105.4	104.2	106.1	101.6	93.3	100.9	94.9	101.3	98.6	93.7	Org:N Dep:R				
D 38 13C2_PFDoA	836	794	788	838	894	783	894	783	820	805	Avg:A Wt:C2	824		RSD=5.1	
	101.5	96.4	95.7	101.7	108.5	95	108.6	95.1	99.6	97.8	Org:N Dep:R				
11 PFDoA	1.078301	1.093400	1.161421	1.133249	1.023409	1.148430	0.968885	0.996616	0.962088	0.956129	Avg:A Wt:C2	1.052193		RSD=7.7	
	102.5	103.9	110.4	107.7	97.3	109.1	92.1	94.7	91.4	90.9	Org:N Dep:R				
4 10:2 FTS	2.431691	2.417723	2.042585	1.973002	2.046900	2.105067	2.304976	2.211797	2.407218	2.684909	Avg:A Wt:C2	2.262587		RSD=10.0	
	107.5	106.9	90.3	87.2	90.5	93	101.9	97.8	106.4	118.7	Org:N Dep:R				
34 PFDOS	1.073137	0.922431	0.946534	0.913711	0.855633	0.975002	0.943574	0.988327	0.968039	0.932586	Avg:A Wt:C2	0.951897		RSD=6.0	
	112.7	96.9	99.4	96	89.9	102.4	99.1	103.8	101.7	98	Org:N Dep:R				
24 PFTrDA	0.591665	0.646658	0.661789	0.566059	0.562968	0.623466	0.515554	0.538767	0.566636	0.549173	Avg:A Wt:C2	0.582273		RSD=8.2	
	101.6	111.1	113.7	97.2	96.7	107.1	88.5	92.5	97.3	94.3	Org:N Dep:R				
D 42 13C2_PFTeDA	941	861	890	911	957	917	876	849	905	895	Avg:A Wt:C2	900		RSD=3.7	
	104.5	95.7	98.9	101.2	106.3	101.9	97.3	94.3	100.5	99.4	Org:N Dep:R				
23 PFTeDA	1.048418	1.016501	0.992103	0.961512	0.909958	0.969674	0.967587	0.894842	0.890991	0.867601	Avg:A Wt:C2	0.951919		RSD=6.2	
	110.1	106.8	104.2	101	95.6	101.9	101.6	94	93.6	91.1	Org:N Dep:R				
35 PFHxDA	1.878457	1.882235	1.817276	1.604325	1.562696	1.503068	1.617013	1.553861	1.643620	1.530394	Avg:A Wt:C2	1.659294		RSD=8.7	
	113.2	113.4	109.5	96.7	94.2	90.6	97.5	93.6	99.1	92.2	Org:N Dep:R				
D 40 13C2_PFHxDA	525	487	507	506	554	549	483	483	485	504	Avg:A Wt:C2	508		RSD=5.2	
	103.3	95.8	99.7	99.6	109	108	95	94.9	95.4	99.2	Org:N Dep:R				
36 PFODA	1.173640	1.136397	1.110372	1.129469	0.986723	1.004241	1.113956	1.065052	1.134494	1.037820	Avg:A Wt:C2	1.089216		RSD=5.7	
	107.8	104.3	101.9	103.7	90.6	92.2	102.3	97.8	104.2	95.3	Org:N Dep:R				

QC Flag Legend

P - Peak(s) Min. # Data Points

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 15-Sep-2021 14:39:12 Cal End Date: 15-Sep-2021 16:14:22
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	091521016.d	ICAL 50_SVLC-1639	15-Sep-2021 14:39:12
2	091521017.d	ICAL 100_SVLC-1640	15-Sep-2021 14:49:45
3	091521018.d	ICAL 200_SVLC-1641	15-Sep-2021 15:00:16
4	091521019.d	ICAL 500_SVLC-1642	15-Sep-2021 15:10:50
5	091521020.d	ICAL 1000_SVLC-1638	15-Sep-2021 15:21:23
6	091521021.d	ICAL 2000_SVLC-1643	15-Sep-2021 15:31:58
7	091521022.d	ICAL 5000_SVLC-1644	15-Sep-2021 15:42:31
8	091521023.d	ICAL 10000_SVLC-1645	15-Sep-2021 15:53:08
9	091521024.d	ICAL 15000_SVLC-1646	15-Sep-2021 16:03:44
10	091521025.d	ICAL 20000_SVLC-1647	15-Sep-2021 16:14:22

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	820356	842140	871233	804067	959050	853404	735252	724638	781350	735514	2.72
* 39 13C2_PFHxA	952905	1040350	923364	1056370	1070620	981971	855308	896857	949871	933293	0.51
* 41 13C2_PFOA	1077878	1009732	1018575	1057201	1165847	1082102	998663	945393	947966	970143	2.63
* 43 13C3_PFBA	1199376	1185647	1138090	1153570	1270347	1139384	1096139	1091614	1106800	1124583	1.60
* 48 13C4_PFOS	265193	224985	227092	236160	253278	241497	232738	241352	226982	234236	3.09

13C2_PFDA ((|735514 - 820356| / (735514 + 820356)) / 2) * 100 = 2.73
13C2_PFHxA ((|933293 - 952905| / (933293 + 952905)) / 2) * 100 = 0.52
13C2_PFOA ((|970143 - 1077878| / (970143 + 1077878)) / 2) * 100 = 2.63
13C3_PFBA ((|1124583 - 1199376| / (1124583 + 1199376)) / 2) * 100= 1.61
13C4_PFOS ((|234236 - 265193| / (234236 + 265193)) / 2) * 100 = 3.10

Report Date: 17-Sep-2021 11:28:50 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 15-Sep-2021 14:39:12 Cal End Date: 15-Sep-2021 16:14:22
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	091521016.d	ICAL 50_SVLC-1639	15-Sep-2021 14:39:12
2	091521017.d	ICAL 100_SVLC-1640	15-Sep-2021 14:49:45
3	091521018.d	ICAL 200_SVLC-1641	15-Sep-2021 15:00:16
4	091521019.d	ICAL 500_SVLC-1642	15-Sep-2021 15:10:50
5	091521020.d	ICAL 1000_SVLC-1638	15-Sep-2021 15:21:23
6	091521021.d	ICAL 2000_SVLC-1643	15-Sep-2021 15:31:58
7	091521022.d	ICAL 5000_SVLC-1644	15-Sep-2021 15:42:31
8	091521023.d	ICAL 10000_SVLC-1645	15-Sep-2021 15:53:08
9	091521024.d	ICAL 15000_SVLC-1646	15-Sep-2021 16:03:44
10	091521025.d	ICAL 20000_SVLC-1647	15-Sep-2021 16:14:22

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1180361	1133154	1148299	1130445	1193454	1145130	1060368	1032220	1110450	1053072	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	68862	133044	263640	659969	1352886	2642375	6097487	11354398	17886146	21792374	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1101191	1032119	1120058	1112101	1164243	1159455	1004457	1064037	1031797	1063719	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	67776	124808	245748	648534	1283993	2560355	5595167	10803478	17114664	21512397	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	351735	364284	368857	360594	375554	362561	333849	323493	354450	341740	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	36619	55677	94378	226162	444945	911267	1836450	3985067	6076330	7857185	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	6926	11633	23670	55982	116944	242467	535083	1016262	1617474	2237925	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	311995	314946	295612	305653	327798	301964	280352	314981	301232	317585	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1064834	1004594	943588	957731	1062655	1027657	942828	913594	939799	957843	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	952905	1040350	923364	1056370	1070620	981971	855308	896857	949871	933293	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	62887	111868	214139	576354	1071807	2089925	4501713	9478300	15000563	17653345	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	19335	35171	70775	169948	330846	667647	1556586	3157377	5029032	6369998	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	18699	32768	57200	144270	283400	593616	1296449	2672785	4053509	5266087	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	752584	820296	652026	756645	838617	798099	776194	812891	760930	727059	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	48950	96536	215771	499385	1058322	2065904	4711195	8710453	13356378	17376090	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1094635	1025244	1053704	1065951	1056209	975823	914743	974988	981763	998411	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	274586	280472	288679	285406	308635	273413	244795	254771	269531	254810	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	16947	31563	64555	150427	315865	608953	1454548	2850654	4153009	5619881	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	98227	168115	344072	878606	1766002	3351293	7963910	14972062	23303007	28015303	
2 6:2 FTS	Disabled	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	Disabled	23265	32250	72720	129706	272989	614374	1118356	1676716	2159151	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	351106	320869	340546	336123	361571	323758	297556	299870	323899	297337	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1025751	1031458	1088640	1087722	1095338	1051480	991342	972352	951984	974712	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	60227	119118	234975	591529	1182143	2287102	5191677	9286364	14864035	19553311	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1077878	1009732	1018575	1057201	1165847	1082102	998663	945393	947966	970143	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	13494	27000	58197	150208	296288	586465	1326824	2529638	3966142	4999634	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	237390	221623	227794	236168	265582	235382	223389	205869	228910	236525	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	265193	224985	227092	236160	253278	241497	232738	241352	226982	234236	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	15656	30459	52087	135182	289924	555377	1255049	2521089	4082286	5220447	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	53336	108254	196714	494644	996290	1968396	4506531	8465650	13322560	16593476	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1113820	1001604	1024420	1113167	1088142	1011616	943456	951173	963549	950358	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	37597	66375	159644	356067	740731	1471612	3396967	6336960	10438659	13485507	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	444515	442805	451492	514909	522841	475744	400159	434949	432363	442732	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	24619	47733	94493	253653	571068	969542	2371422	4677886	7409322	9534872	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	9824	21841	41961	110786	219009	452949	948050	1982714	3365792	4036960	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	880708	835145	993552	861123	921365	935998	750017	824990	796043	686499	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	5551	9096	16017	42814	75768	169583	395222	656887	931576	1197138	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	820356	842140	871233	804067	959050	853404	735252	724638	781350	735514	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	46392	101640	189868	396693	880120	1849605	4320034	7195815	12504149	14780656	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	222426	218734	225248	284373	254101	232497	195543	200185	196290	171610	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1266866	1408591	1097944	1264571	1348016	1281852	1246333	1264955	1384056	1258320	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	11178	20720	40768	104034	204751	420080	960759	1869757	3069113	3981073	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	12561	18173	49222	115801	223974	453547	1019100	2230630	3397509	4374611	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	133802	133384	135768	126789	140684	138157	126635	123217	125645	132058	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	6782	13535	31007	65705	144905	250207	693961	1170392	1902787	2627748	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	45955	80758	161517	397159	853022	1364135	3630395	6641614	10585266	12132796	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1203462	1164738	1174548	1147985	1200935	1158723	1065498	954871	960363	898843	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	843608	835054	847652	838514	831314	868975	752673	738887	721491	685500	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	15964	24952	47407	118932	240162	471835	1001221	1846146	3103499	3905964	
26 MeFOSA	Disabled	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	Disabled	6080	17515	36987	78532	129477	334192	672012	1102430	1370362	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	70243	65593	62432	73878	71225	66095	62016	69907	65479	70738	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	30991	69278	131489	297899	642953	1326185	2766387	5948310	9624622	12002480	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	124009	128967	118232	118685	130028	124258	120326	124954	135446	130245	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	6250	13624	22423	50794	113465	214782	505227	968260	1608917	2064652	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	59497	60123	59604	60666	64923	64024	60860	55068	62640	63459	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3616	7222	14583	35546	69816	149030	333102	643194	1067824	1371729	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	835574	794037	788220	837595	893930	782748	894153	783498	820296	805259	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	45050	86820	183091	474602	914856	1797862	4331659	7808466	11837953	15398625	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	5214	10196	17741	54087	100279	188721	434496	853658	1366507	1776680	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	12330	19789	41743	104442	219969	444308	1020195	1969549	3217543	4270426	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	24719	51347	104327	237064	503254	976034	2304920	4221230	6972137	8844522	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	940751	861386	890447	911225	956542	917098	875570	848736	905041	895181	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	49315	87560	176683	438077	870413	1778572	4235952	7594845	12095745	15533207	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	49351	91659	184323	406227	865801	1651153	3906081	7500844	11957757	15429490	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	525442	486969	507141	506415	554043	549261	483123	482723	485017	504102	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	30834	55339	112623	285990	546687	1103181	2690888	5141249	8253730	10463347	

Report Date: 17-Sep-2021 11:28:50 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 15-Sep-2021 14:39:12 Cal End Date: 15-Sep-2021 16:14:22

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Batch: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	091521016.d	ICAL 50_SVLC-1639	15-Sep-2021 14:39:12
2	091521017.d	ICAL 100_SVLC-1640	15-Sep-2021 14:49:45
3	091521018.d	ICAL 200_SVLC-1641	15-Sep-2021 15:00:16
4	091521019.d	ICAL 500_SVLC-1642	15-Sep-2021 15:10:50
5	091521020.d	ICAL 1000_SVLC-1638	15-Sep-2021 15:21:23
6	091521021.d	ICAL 2000_SVLC-1643	15-Sep-2021 15:31:58
7	091521022.d	ICAL 5000_SVLC-1644	15-Sep-2021 15:42:31
8	091521023.d	ICAL 10000_SVLC-1645	15-Sep-2021 15:53:08
9	091521024.d	ICAL 15000_SVLC-1646	15-Sep-2021 16:03:44
10	091521025.d	ICAL 20000_SVLC-1647	15-Sep-2021 16:14:22

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.727	1.727	1.727	1.721	1.721	1.721	1.725	1.727	1.727	1.727	1.725	0.183
8 PFBA	1.734	1.727	1.727	1.728	1.727	1.727	1.732	1.734	1.727	1.734	1.729	0.168
D 50 13C5_PFPeA	2.110	2.110	2.110	2.110	2.110	2.110	2.107	2.120	2.110	2.110	2.110	0.171
21 PFPeA	2.110	2.110	2.110	2.110	2.110	2.110	2.117	2.120	2.110	2.110	2.111	0.193
D 44 13C3_PFBS	2.172	2.172	2.162	2.162	2.162	2.162	2.170	2.172	2.162	2.162	2.165	0.241
7 PFBS	2.172	2.172	2.162	2.162	2.162	2.162	2.170	2.172	2.172	2.172	2.167	0.248
1 4:2 FTS	2.459	2.459	2.450	2.450	2.459	2.450	2.456	2.467	2.459	2.459	2.456	0.220
D 63 13C2_4:2 FTS_2	2.459	2.459	2.450	2.450	2.459	2.450	2.456	2.459	2.450	2.459	2.454	0.168
D 49 13C5_PFHxA	2.502	2.502	2.493	2.494	2.493	2.493	2.499	2.502	2.493	2.493	2.496	0.163
* 39 13C2_PFHxA	2.502	2.493	2.493	2.494	2.493	2.493	2.508	2.502	2.502	2.502	2.498	0.221
15 PFHxA	2.502	2.502	2.493	2.494	2.493	2.493	2.499	2.502	2.502	2.502	2.498	0.172
22 PFPeS	2.537	2.537	2.528	2.528	2.528	2.528	2.534	2.537	2.528	2.528	2.531	0.159
28 GenX	2.625	2.610	2.617	2.617	2.625	2.617	2.623	2.625	2.625	2.617	2.620	0.195
D 66 13C3_GenX	2.625	2.625	2.610	2.617	2.625	2.617	2.623	2.632	2.617	2.617	2.620	0.243
13 PFHpA	2.890	2.890	2.890	2.890	2.890	2.889	2.896	2.890	2.890	2.898	2.890	0.106
D 47 13C4_PFHpA	2.890	2.890	2.890	2.890	2.890	2.889	2.896	2.899	2.890	2.890	2.891	0.113
D 45 13C3_PFHxS	2.906	2.906	2.906	2.906	2.906	2.905	2.911	2.906	2.906	2.905	2.906	0.059
14 PFHxS	2.914	2.906	2.906	2.899	2.906	2.905	2.911	2.914	2.914	2.905	2.908	0.167
29 ADONA	2.934	2.934	2.934	2.928	2.928	2.927	2.939	2.941	2.934	2.933	2.933	0.165
2 6:2 FTS	Disabled	3.246	3.259	3.253	3.254	3.252	3.258	3.261	3.253	3.259	3.254	0.145
D 64 13C2_6:2 FTS_2	3.253	3.253	3.259	3.253	3.261	3.252	3.258	3.255	3.253	3.252	3.254	0.102
D 53 13C8_PFOA	3.279	3.279	3.279	3.279	3.280	3.278	3.284	3.281	3.285	3.285	3.280	0.089
20 PFOA	3.285	3.279	3.279	3.279	3.280	3.285	3.284	3.287	3.285	3.285	3.282	0.105
* 41 13C2_PFOA	3.279	3.279	3.279	3.279	3.287	3.285	3.284	3.281	3.285	3.285	3.282	0.103
12 PFHpS	3.285	3.279	3.279	3.285	3.287	3.285	3.291	3.287	3.285	3.285	3.284	0.113
D 54 13C8_PFOS	3.659	3.651	3.651	3.659	3.662	3.658	3.657	3.655	3.659	3.666	3.657	0.119
* 48 13C4_PFOS	3.644	3.651	3.659	3.659	3.662	3.658	3.657	3.655	3.659	3.666	3.656	0.165
18 PFOS	3.651	3.651	3.651	3.652	3.662	3.658	3.657	3.663	3.659	3.666	3.657	0.147
17 PFNA	3.659	3.659	3.666	3.666	3.669	3.666	3.671	3.669	3.666	3.666	3.665	0.112
D 56 13C9_PFNA	3.659	3.659	3.659	3.659	3.669	3.666	3.664	3.663	3.666	3.666	3.662	0.107
30 9Cl-PF3ONS	3.856	3.856	3.863	3.864	3.865	3.863	3.867	3.866	3.871	3.871	3.863	0.135
D 55 13C8_PFOSA	3.901	3.901	3.901	3.901	3.903	3.908	3.905	3.904	3.909	3.908	3.904	0.080

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
19 PFOSA	3.909	3.901	3.901	3.909	3.910	3.901	3.905	3.904	3.909	3.908	3.905	0.097
16 PFNS	3.993	4.003	4.003	4.003	4.004	4.002	4.007	4.005	4.003	4.002	4.002	0.093
D 51 13C6_PFDA	4.013	4.013	4.013	4.013	4.014	4.022	4.017	4.015	4.023	4.022	4.016	0.111
3 8:2 FTS	4.013	4.013	4.013	4.013	4.014	4.012	4.017	4.015	4.013	4.012	4.013	0.035
* 37 13C2_PFDA	4.013	4.013	4.013	4.013	4.014	4.022	4.017	4.015	4.023	4.022	4.016	0.111
10 PFDA	4.013	4.013	4.013	4.023	4.014	4.012	4.017	4.015	4.023	4.022	4.016	0.111
D 65 13C2_8:2 FTS_2	4.013	4.013	4.013	4.013	4.014	4.012	4.007	4.015	4.013	4.012	4.012	0.055
D 58 d3-MeFOSAA	4.172	4.163	4.172	4.172	4.173	4.171	4.176	4.174	4.180	4.180	4.173	0.112
6 N-MeFOSAA	4.172	4.172	4.172	4.180	4.181	4.180	4.176	4.174	4.180	4.180	4.176	0.098
9 PFDS	4.295	4.304	4.304	4.313	4.305	4.313	4.308	4.306	4.313	4.313	4.307	0.129
D 61 d7-MeFOSE	4.304	4.304	4.304	4.304	4.305	4.313	4.308	4.306	4.313	4.313	4.307	0.084
32 MeFOSE	4.322	4.313	4.313	4.322	4.314	4.321	4.317	4.324	4.322	4.321	4.318	0.093
25 PFUdA	4.331	4.331	4.322	4.331	4.323	4.330	4.326	4.333	4.331	4.339	4.329	0.111
D 60 d5-EtFOSAA	4.331	4.322	4.322	4.331	4.332	4.330	4.326	4.333	4.331	4.339	4.329	0.120
D 52 13C7_PFUdA	4.322	4.331	4.322	4.331	4.332	4.330	4.326	4.333	4.331	4.330	4.328	0.091
5 N-EtFOSAA	4.340	4.331	4.340	4.340	4.332	4.339	4.335	4.342	4.340	4.339	4.337	0.085
26 MeFOSA	Disabled	4.331	4.331	4.331	4.332	4.339	4.335	4.333	4.340	4.339	4.334	0.093
D 57 d3-MeFOSA	4.331	4.331	4.322	4.331	4.332	4.330	4.326	4.333	4.331	4.330	4.329	0.070
31 11Cl-PF3OUDS	4.469	4.461	4.461	4.469	4.470	4.468	4.466	4.470	4.469	4.475	4.467	0.093
D 62 d9-EtFOSE	4.469	4.469	4.469	4.476	4.470	4.468	4.473	4.470	4.469	4.475	4.470	0.067
33 EtFOSE	4.483	4.476	4.476	4.483	4.484	4.483	4.480	4.485	4.483	4.490	4.482	0.095
D 59 d5-EtFOSA	4.490	4.490	4.490	4.490	4.492	4.490	4.495	4.492	4.498	4.497	4.492	0.067
27 EtFOSA	4.498	4.498	4.498	4.498	4.499	4.504	4.502	4.499	4.505	4.504	4.500	0.071
D 38 13C2_PFDoA	4.604	4.604	4.604	4.613	4.606	4.604	4.608	4.606	4.613	4.612	4.607	0.082
11 PFDoA	4.604	4.604	4.604	4.613	4.606	4.604	4.608	4.606	4.613	4.612	4.607	0.082
4 10:2 FTS	4.613	4.613	4.629	4.621	4.622	4.620	4.616	4.622	4.629	4.629	4.621	0.138
34 PFDOS	4.820	4.820	4.820	4.826	4.821	4.825	4.822	4.827	4.832	4.825	4.823	0.080
24 PFTrDA	4.855	4.849	4.855	4.855	4.850	4.854	4.852	4.856	4.860	4.860	4.854	0.079
D 42 13C2_PFTeDA	5.077	5.077	5.084	5.084	5.085	5.083	5.082	5.084	5.084	5.083	5.082	0.062
23 PFTeDA	5.084	5.084	5.084	5.084	5.085	5.083	5.082	5.091	5.091	5.091	5.085	0.075
35 PFHxDA	5.511	5.511	5.521	5.511	5.512	5.512	5.516	5.521	5.521	5.521	5.515	0.090
D 40 13C2_PFHxDA	5.511	5.511	5.511	5.511	5.512	5.512	5.516	5.521	5.521	5.521	5.514	0.086
36 PFODA	5.951	5.951	5.968	5.951	5.960	5.960	5.964	5.968	5.967	5.960	5.959	0.114

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521027.d
Injection Date: 15-Sep-2021 16:35:41 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1629 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1193454	1185496			99.3	50 - 150
8 PFBA			500.00	450.18	90	70 - 130
21 PFPeA			500.00	463.56	92.7	70 - 130
D 50 13C5_PFPeA	1164243	1124461			96.6	50 - 150
D 44 13C3_PFBS	375554	362490			96.5	50 - 150
7 PFBS			442.50	381.11	86.1	70 - 130
D 63 13C2_4:2 FTS_2	327798	319694			97.5	50 - 150
1 4:2 FTS			467.50	403.33	86.3	70 - 130
D 49 13C5_PFHxA	1062655	1022041			96.2	50 - 150
15 PFHxA			500.00	424.83	85	70 - 130
22 PFPeS			470.00	422.98	90	70 - 130
28 GenX			2500.00	2283.18	91.3	70 - 130
D 66 13C3_GenX	838617	847351			101	50 - 150
D 47 13C4_PFHpA	1056209	1082282			102.5	50 - 150
13 PFHpA			500.00	479.27	95.9	70 - 130
D 45 13C3_PFHxS	308635	292472			94.8	50 - 150
14 PFHxS			456.00	391.32	85.8	70 - 130
29 ADONA			2355.00	2125.87	90.3	70 - 130
2 6:2 FTS			475.00	371.32	78.2	70 - 130
D 64 13C2_6:2 FTS_2	361571	352441			97.5	50 - 150
D 53 13C8_PFOA	1095338	1053825			96.2	50 - 150
20 PFOA			500.00	534.38	106.9	70 - 130
12 PFHpS			475.00	414.48	87.3	70 - 130
18 PFOS			462.75	405.89	87.7	70 - 130
D 54 13C8_PFOS	265582	244713			92.1	50 - 150
17 PFNA			500.00	482.77	96.6	70 - 130
D 56 13C9_PFNA	1088142	1026658			94.3	50 - 150
30 9Cl-PF3ONS			2330.00	1854.15	79.6	70 - 130
D 55 13C8_PFOSA	522841	466037			89.1	50 - 150
19 PFOSA			500.00	434.23	86.8	70 - 130
16 PFNS			480.00	411.92	85.8	70 - 130
10 PFDA			500.00	432.04	86.4	70 - 130
3 8:2 FTS			480.00	437.80	91.2	70 - 130
D 51 13C6_PFDA	921365	954986			103.6	50 - 150
D 65 13C2_8:2 FTS_2	254101	223480			87.9	50 - 150
D 58 d3-MeFOSAA	1348016	1529537			113.5	50 - 150

Report Date: 17-Sep-2021 11:28:00 AIM Revision: 2.0.2021.0812
Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521027.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	471.28	94.3	70 - 130
D 61 d7-MeFOSE	140684	133464			94.9	50 - 150
9 PFDS			482.50	464.69	96.3	70 - 130
25 PFUdA			500.00	466.70	93.3	70 - 130
D 60 d5-EtFOSAA	1200935	1222686			101.8	50 - 150
D 57 d3-MeFOSA	71225	76952			108	50 - 150
D 52 13C7_PFUdA	831314	824197			99.1	50 - 150
5 N-EtFOSAA			500.00	507.31	101.5	70 - 130
31 11Cl-PF3OUDS			2355.00	1941.37	82.4	70 - 130
D 62 d9-EtFOSE	130028	140505			108.1	50 - 150
D 59 d5-EtFOSA	64923	63910			98.4	50 - 150
11 PFDoA			500.00	448.52	89.7	70 - 130
D 38 13C2_PFDoA	893930	867687			97.1	50 - 150
4 10:2 FTS			2410.00	2424.90	100.6	70 - 130
24 PFTrDA			500.00	456.14	91.2	70 - 130
D 42 13C2_PFTeDA	956542	974765			101.9	50 - 150
23 PFTeDA			500.00	436.64	87.3	70 - 130
D 40 13C2_PFHxDA	554043	524117			94.6	50 - 150

Report Date: 17-Sep-2021 15:03:09 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 16-Sep-2021 17:50:57 Cal End Date: 16-Sep-2021 19:26:41

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	091621013.d	F.L. ICAL 50_SVLC-1639	16-Sep-2021 17:50:57
2	091621014.d	F.L. ICAL 100_SVLC-1640	16-Sep-2021 18:01:36
3	091621015.d	F.L. ICAL 200_SVLC-1641	16-Sep-2021 18:12:14
4	091621016.d	F.L. ICAL 500_SVLC-1642	16-Sep-2021 18:22:54
5	091621017.d	F.L. ICAL 1000_SVLC-1638	16-Sep-2021 18:33:27
6	091621018.d	F.L. ICAL 2000_SVLC-1644	16-Sep-2021 18:44:07
7	091621019.d	F.L. ICAL 5000_SVLC-1645	16-Sep-2021 18:54:42
8	091621020.d	F.L. ICAL 10000_SVLC-1646	16-Sep-2021 19:05:23
9	091621021.d	F.L. ICAL 15000_SVLC-1647	16-Sep-2021 19:16:01
10	091621022.d	F.L. ICAL 20000_SVLC-1648	16-Sep-2021 19:26:41

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	Avg. +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.666	4.385	3.202	3.321	3.402	3.557	3.426	3.452	3.418	3.484	3.531	2.568-4.493	0.32089	1.765
1 4:2 FTS	2.541	1.175	2.043	1.810	1.749	1.985	1.912	1.828	1.893	1.899	1.883	0.928-2.838	0.31843	0.941
15 PFHxA	16.585	18.902	21.011	19.634	18.344	21.117	18.155	18.868	18.550	18.256	18.942	14.894-22.989	1.34918	9.471
22 PFPeS	3.159	2.996	2.947	2.711	3.092	3.061	2.955	2.975	3.009	3.082	2.998	2.599-3.397	0.13296	1.499
28 GenX	0.746	0.833	0.813	0.756	0.783	0.795	0.797	0.770	0.806	0.785	0.788	0.713-0.863	0.02512	0.394
13 PFHpA	5.405	3.545	3.937	3.702	4.044	3.804	3.740	3.941	3.796	3.841	3.975	2.430-5.520	0.51493	1.987
14 PFHxS	2.408	2.647	2.774	3.489	3.153	3.228	3.150	3.069	3.172	3.086	3.017	2.070-3.964	0.31565	1.508
29 ADONA	3.322	2.948	3.531	3.324	3.230	3.223	3.310	3.209	3.192	3.084	3.237	2.791-3.683	0.14876	1.618
2 6:2 FTS	Disabled	1.657	2.081	1.787	1.899	1.784	1.876	1.847	1.912	1.825	1.852	1.469-2.234	0.12737	0.926
20 PFOA	3.343	2.859	2.818	2.897	2.926	2.980	3.145	2.922	2.871	2.896	2.965	2.461-3.469	0.16800	1.482
12 PFHpS	3.729	3.033	2.859	3.524	3.013	3.096	2.983	3.098	3.166	3.074	3.157	2.351-3.963	0.26851	1.578
18 PFOS	3.333	2.855	3.013	3.594	3.408	3.304	3.307	3.335	3.334	3.488	3.297	2.669-3.924	0.20904	1.648
17 PFNA	5.821	7.384	6.256	6.668	6.614	6.422	6.246	6.408	6.486	6.313	6.461	5.303-7.619	0.38599	3.230
19 PFOSA	29.693	32.074	34.386	28.083	30.760	30.183	27.479	32.192	29.621	31.380	30.585	13.709-47.460	5.62520	15.292
16 PFNS	4.300	3.304	2.808	2.877	2.421	2.718	2.429	2.456	2.723	2.707	2.874	1.200-4.548	0.55799	1.437
3 8:2 FTS	1.933	2.261	2.456	1.693	2.082	1.977	2.138	1.845	1.930	1.973	2.028	1.324-2.733	0.23491	1.014
10 PFDA	14.973	12.720	15.148	13.039	14.845	14.225	15.787	14.250	13.587	13.692	14.226	11.217-17.235	1.00311	7.113
6 N-MeFOSAA	1.079	1.258	1.167	1.168	1.318	1.246	1.315	1.321	1.309	1.241	1.242	0.998-1.485	0.08113	0.621
9 PFDS	4.625	2.602	2.886	2.504	3.214	2.768	2.765	2.593	2.735	2.630	2.932	1.047-4.817	0.62835	1.466
26 MeFOSA	1.217	0.842	1.119	1.165	1.120	1.020	0.971	1.018	1.108	1.060	1.064	0.735-1.392	0.10934	0.532
25 PFUdA	35.434	20.669	11.741	12.264	13.648	14.863	15.417	14.823	14.123	14.215	16.719	-4.017-37.456	6.91238	8.359
5 N-EtFOSAA	1.330	1.587	1.535	1.721	1.573	1.626	1.505	1.534	1.572	1.563	1.554	1.265-1.843	0.09626	0.777
27 EtFOSA	0.876	1.171	0.930	1.007	0.945	0.960	1.010	0.986	1.005	1.000	0.989	0.758-1.220	0.07700	0.494
11 PFDoA	8.904	9.354	9.537	11.741	11.572	11.104	11.103	10.867	10.694	9.831	10.470	7.457-13.484	1.00454	5.235
4 10:2 FTS	3.784	3.078	3.153	3.171	3.437	3.341	3.315	3.196	3.372	3.371	3.321	2.751-3.892	0.19021	1.660
34 PFDOS	3.378	2.730	2.787	3.114	3.026	3.001	3.024	3.044	2.994	3.120	3.021	2.486-3.557	0.17855	1.510
24 PFTrDA	7.975	8.934	8.289	8.434	8.792	8.550	8.411	8.455	8.862	8.199	8.490	7.593-9.387	0.29903	4.245
23 PFTeDA	11.748	12.458	11.204	12.395	12.034	12.479	12.300	12.158	11.786	11.785	12.034	10.872-13.196	0.38733	6.017
35 PFHxDA	11.823	10.412	10.301	11.375	11.141	10.998	10.838	10.872	10.827	10.710	10.929	9.575-12.284	0.45151	5.464
36 PFODA	12.915	13.733	13.525	14.501	14.460	14.339	14.530	14.268	14.161	14.090	14.052	12.416-15.687	0.54516	7.026

Report Date: 17-Sep-2021 15:03:08 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 16-Sep-2021 17:50:57 Cal End Date: 16-Sep-2021 19:26:41
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	091621013.d	F.L. ICAL 50_SVLC-1639	16-Sep-2021 17:50:57
2	091621014.d	F.L. ICAL 100_SVLC-1640	16-Sep-2021 18:01:36
3	091621015.d	F.L. ICAL 200_SVLC-1641	16-Sep-2021 18:12:14
4	091621016.d	F.L. ICAL 500_SVLC-1642	16-Sep-2021 18:22:54
5	091621017.d	F.L. ICAL 1000_SVLC-1638	16-Sep-2021 18:33:27
6	091621018.d	F.L. ICAL 2000_SVLC-1644	16-Sep-2021 18:44:07
7	091621019.d	F.L. ICAL 5000_SVLC-1645	16-Sep-2021 18:54:42
8	091621020.d	F.L. ICAL 10000_SVLC-1646	16-Sep-2021 19:05:23
9	091621021.d	F.L. ICAL 15000_SVLC-1647	16-Sep-2021 19:16:01
10	091621022.d	F.L. ICAL 20000_SVLC-1648	16-Sep-2021 19:26:41

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area
Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None
Org: Origin, F-Force, I-Include, N-Neither
Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	644	666	676	659	702	623	591	595	605	596	Avg:A Wt:C2	636		RSD=6.2	
	101.4	104.8	106.4	103.7	110.4	98	93	93.6	95.1	93.7	Org:N Dep:R				
8 PFBA	1.128052	1.131085	1.142471	1.095866	1.074221	1.105403	1.106702	1.071524	1.097563	1.060040	Avg:A Wt:C2	1.101293		RSD=2.5	
	102.4	102.7	103.7	99.5	97.5	100.4	100.5	97.3	99.7	96.3	Org:N Dep:R				
D 50 13C5_PFPeA	604	616	614	619	676	597	558	595	556	550	Avg:A Wt:C2	598		RSD=6.3	
	100.9	103	102.6	103.4	112.9	99.7	93.3	99.5	92.9	92	Org:N Dep:R				
21 PFPeA	1.233482	1.235408	1.163891	1.138176	1.143221	1.197856	1.167866	1.132613	1.154710	1.112597	Avg:A Wt:C2	1.167982		RSD=3.6	
	105.6	105.8	99.6	97.4	97.9	102.6	100	97	98.9	95.3	Org:N Dep:R				
D 44 13C3_PFBS	193	192	200	195	216	189	179	185	173	175	Avg:A Wt:C2	190		RSD=6.7	
	101.8	101.4	105.6	102.8	113.8	99.3	94.2	97.5	91.2	92.4	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
7 PFBS	1.282646	1.463372	1.279169	1.300815	1.180733	1.323541	1.265535	1.271015	1.377161	1.310860	Avg:A Wt:C2	1.305485		RSD=5.7	
	98.3	112.1	98	99.6	90.4	101.4	96.9	97.4	105.5	100.4	Org:N Dep:R				
1 4:2 FTS	2.500931	2.087100	2.911193	2.553622	2.213725	2.372128	2.268647	2.256738	2.559648	2.213755	Avg:A Wt:C2	2.393749		RSD=10.1	
	104.5	87.2	121.6	106.7	92.5	99.1	94.8	94.3	106.9	92.5	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	22.1074	22.6896	20.5862	21.3980	22.6976	21.4374	19.6676	20.2888	19.3780	21.2730	Avg:A Wt:C2	21.1524		RSD=5.5	
	104.5	107.3	97.3	101.2	107.3	101.3	93	95.9	91.6	100.6	Org:N Dep:R				
D 49 13C5_PFHxA	680	722	739	689	782	687	623	645	631	633	Avg:A Wt:C2	683		RSD=7.7	
	99.5	105.7	108.3	100.8	114.4	100.6	91.3	94.4	92.4	92.6	Org:N Dep:R				
15 PFHxA	1.114329	1.188435	1.172929	1.190662	1.022461	1.113150	1.108164	1.081871	1.122797	1.054153	Avg:A Wt:C2	1.116895		RSD=5.0	
	99.8	106.4	105	106.6	91.5	99.7	99.2	96.9	100.5	94.4	Org:N Dep:R				
22 PFPeS	1.093544	0.913950	0.941155	0.933263	0.865325	0.949190	0.930999	0.931917	0.995894	0.976565	Avg:A Wt:C2	0.953180		RSD=6.3	
	114.7	95.9	98.7	97.9	90.8	99.6	97.7	97.8	104.5	102.5	Org:N Dep:R				
28 GenX	0.726371	0.713700	0.723483	0.701539	0.651480	0.700587	0.704455	0.665227	0.729794	0.686729	Avg:A Wt:C2	0.700336		RSD=3.7	
	103.7	101.9	103.3	100.2	93	100	100.6	95	104.2	98.1	Org:N Dep:R				
D 66 13C3_GenX	241	246	248	245	271	240	225	229	223	220	Avg:A Wt:C2	239		RSD=6.5	
	100.8	103.3	103.9	102.8	113.7	100.3	94.1	95.8	93.2	92.2	Org:N Dep:R				
13 PFHpA	1.287747	1.131011	1.200317	1.158753	1.164292	1.229204	1.144070	1.114556	1.193599	1.147956	Avg:A Wt:C2	1.177150		RSD=4.4	
	109.4	96.1	102	98.4	98.9	104.4	97.2	94.7	101.4	97.5	Org:N Dep:R				
D 47 13C4_PFHpA	575	590	580	573	612	526	523	542	530	517	Avg:A Wt:C2	557		RSD=6.0	
	103.3	105.9	104.1	103	110	94.5	94	97.3	95.2	92.8	Org:N Dep:R				
D 45 13C3_PFHxS	134	147	146	150	155	134	130	138	125	125	Avg:A Wt:C2	138		RSD=7.7	
	96.8	105.9	105.2	108.7	112.3	96.5	93.9	99.6	90.6	90.4	Org:N Dep:R				
14 PFHxS	1.123694	1.108878	1.086143	1.129525	1.165804	1.218776	1.170959	1.092288	1.221492	1.201207	Avg:A Wt:C2	1.151877		RSD=4.4	
	97.6	96.3	94.3	98.1	101.2	105.8	101.7	94.8	106	104.3	Org:N Dep:R				
29 ADONA	8.095591	7.772164	8.125998	7.377072	7.654192	7.925470	8.116723	7.393252	8.183522	7.702523	Avg:A Wt:C2	7.834651		RSD=3.9	
	103.3	99.2	103.7	94.2	97.7	101.2	103.6	94.4	104.5	98.3	Org:N Dep:R				
2 6:2 FTS	Disabled	4.054846	3.083771	2.542238	2.483945	2.523355	2.539316	2.437183	2.560068	2.254989	Ln:A Wt:C2	2.386175	151	R^2=0.996	
	Disabled	103.4	96	93.2	97.4	102.4	105.1	101.5	106.8	94.2	Org:N Dep:R			RSE=5.3	
D 64 13C2_6:2 FTS_2	22.1294	23.5016	21.7588	21.5656	24.3734	21.2314	20.1006	18.8082	19.6678	20.0876	Avg:A Wt:C2	21.3224		RSD=8.1	
	103.8	110.2	102	101.1	114.3	99.6	94.3	88.2	92.2	94.2	Org:N Dep:R				
D 53 13C8_PFOA	586	589	595	585	639	593	559	529	522	503	Avg:A Wt:C2	570		RSD=7.3	
	102.8	103.4	104.3	102.6	112.1	104.1	98.1	92.9	91.5	88.2	Org:N Dep:R				
20 PFOA	1.308568	1.206122	1.116657	1.063578	1.081552	1.059807	1.104937	1.062909	1.089811	1.050506	Avg:A Wt:C2	1.114445		RSD=7.3	
	117.4	108.2	100.2	95.4	97	95.1	99.1	95.4	97.8	94.3	Org:N Dep:R				
12 PFHpS	1.193675	1.038534	1.122798	1.087150	1.047305	1.151159	1.115402	1.006645	1.142411	1.091211	Avg:A Wt:C2	1.099629		RSD=5.2	
	108.6	94.4	102.1	98.9	95.2	104.7	101.4	91.5	103.9	99.2	Org:N Dep:R				
D 56 13C9_PFNA	712	730	695	698	733	647	659	624	627	619	Avg:A Wt:C2	674		RSD=6.6	
	105.5	108.3	103.1	103.4	108.7	96	97.7	92.5	93	91.8	Org:N Dep:R				
D 54 13C8_PFOS	147	146	137	148	154	128	131	129	131	128	Avg:A Wt:C2	138		RSD=7.1	
	106.5	106.1	99.2	107.1	111.7	93.2	94.8	93.6	94.9	92.9	Org:N Dep:R				
18 PFOS	1.508997	1.283199	1.364725	1.265293	1.184124	1.276046	1.233279	1.242151	1.228515	1.237339	Avg:A Wt:C2	1.282367		RSD=7.2	
	117.7	100.1	106.4	98.7	92.3	99.5	96.2	96.9	95.8	96.5	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
17 PFNA	1.138163	1.310037	1.209841	1.210746	1.143036	1.198993	1.099312	1.128130	1.151754	1.078896	Avg:A Wt:C2	1.166891		RSD=5.8	
	97.5	112.3	103.7	103.8	98	102.8	94.2	96.7	98.7	92.5	Org:N Dep:R				
30 9Cl-PF3ONS	4.048511	3.938332	4.636654	4.187992	4.029314	4.460031	4.264581	4.252590	4.390237	4.385761	Avg:A Wt:C2	4.259400		RSD=5.1	
	95	92.5	108.9	98.3	94.6	104.7	100.1	99.8	103.1	103	Org:N Dep:R				
D 55 13C8_PFOSA	272	292	290	291	308	262	268	260	257	263	Avg:A Wt:C2	276		RSD=6.3	
	98.6	105.7	104.9	105.3	111.3	94.9	97	94	93	95.3	Org:N Dep:R				
19 PFOSA	1.264028	1.132549	1.263754	1.084770	1.098462	1.208117	1.104383	1.157024	1.187866	1.139207	Avg:A Wt:C2	1.164016		RSD=5.6	
	108.6	97.3	108.6	93.2	94.4	103.8	94.9	99.4	102	97.9	Org:N Dep:R				
16 PFNS	0.937622	1.049021	1.139342	0.931218	0.903703	0.992645	0.841887	0.934549	0.934655	0.938583	Avg:A Wt:C2	0.960323		RSD=8.6	
	97.6	109.2	118.6	97	94.1	103.4	87.7	97.3	97.3	97.7	Org:N Dep:R				
D 51 13C6_PFDA	680	657	709	703	761	661	591	622	634	583	Avg:A Wt:C2	660		RSD=8.4	
	102.9	99.6	107.5	106.5	115.2	100.2	89.5	94.2	96.1	88.3	Org:N Dep:R				
3 8:2 FTS	2.337623	2.888912	2.307225	2.352187	2.425039	2.372907	2.515790	2.161080	2.328301	2.272597	Avg:A Wt:C2	2.396166		RSD=8.2	
	97.6	120.6	96.3	98.2	101.2	99	105	90.2	97.2	94.8	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	21.8090	22.7130	22.6596	22.2846	24.1414	21.1660	19.6832	21.2032	19.1790	19.2272	Avg:A Wt:C2	21.4066		RSD=7.7	
	101.9	106.1	105.9	104.1	112.8	98.9	91.9	99	89.6	89.8	Org:N Dep:R				
10 PFDA	1.302727	1.411859	1.182736	1.289557	1.151865	1.234990	1.436322	1.215175	1.156538	1.169540	Avg:A Wt:C2	1.255131		RSD=8.2	
	103.8	112.5	94.2	102.7	91.8	98.4	114.4	96.8	92.1	93.2	Org:N Dep:R				
D 58 d3-MeFOSAA	150	148	156	157	164	148	145	137	151	146	Avg:A Wt:C2	150		RSD=4.9	
	100.1	98.3	104.2	104.3	109.2	98.3	96.6	91.6	100.3	97.2	Org:N Dep:R				
6 N-MeFOSAA	0.805669	0.883329	0.787957	0.805491	0.796625	0.793531	0.829784	0.821303	0.770121	0.752416	Avg:A Wt:C2	0.804623		RSD=4.4	
	100.1	109.8	97.9	100.1	99	98.6	103.1	102.1	95.7	93.5	Org:N Dep:R				
D 61 d7-MeFOSE	89.5850	95.2610	87.6110	87.8930	93.5750	87.9970	80.0010	83.3350	82.7030	88.4820	Avg:A Wt:C2	87.6443		RSD=5.4	
	102.2	108.7	100	100.3	106.8	100.4	91.3	95.1	94.4	101	Org:N Dep:R				
9 PFDS	0.828931	0.887695	0.994828	0.766240	0.882393	0.968046	0.881181	0.874559	0.908544	0.866704	Avg:A Wt:C2	0.885912		RSD=7.3	
	93.6	100.2	112.3	86.5	99.6	109.3	99.5	98.7	102.6	97.8	Org:N Dep:R				
32 MeFOSE	1.492661	1.047753	1.296070	1.248154	1.174170	1.128948	1.214970	1.166687	1.182276	1.042814	Avg:A Wt:C2	1.199450		RSD=10.9	
	124.4	87.4	108.1	104.1	97.9	94.1	101.3	97.3	98.6	86.9	Org:N Dep:R				
D 57 d3-MeFOSA	52.0710	49.2760	47.8300	50.1530	53.7500	50.9550	46.2290	46.1570	48.0020	56.6610	Avg:A Wt:C2	50.1084		RSD=6.7	
	103.9	98.3	95.5	100.1	107.3	101.7	92.3	92.1	95.8	113.1	Org:N Dep:R				
D 60 d5-EtFOSAA	125	132	136	132	149	118	120	112	108	104	Avg:A Wt:C2	124		RSD=11.3	
	101	106.9	110.2	106.6	120.6	95.4	97.1	90.5	87.6	84.1	Org:N Dep:R				
D 52 13C7_PFUdA	714	746	739	778	777	714	683	658	626	612	Avg:A Wt:C2	705		RSD=8.3	
	101.4	105.9	104.8	110.4	110.3	101.4	96.9	93.3	88.9	86.8	Org:N Dep:R				
26 MeFOSA	1.202589	1.130571	1.211269	1.091859	1.108391	1.032607	1.035013	1.038122	1.070047	0.788088	Avg:A Wt:C2	1.070856		RSD=11.1	
	112.3	105.6	113.1	102	103.5	96.4	96.7	96.9	99.9	73.6	Org:N Dep:R				
25 PFUdA	1.173566	1.003777	0.992896	0.918370	1.000852	1.005274	0.994790	1.001682	1.026356	0.940144	Avg:A Wt:C2	1.005771		RSD=6.7	
	116.7	99.8	98.7	91.3	99.5	100	98.9	99.6	102	93.5	Org:N Dep:R				
5 N-EtFOSAA	1.101857	1.102301	1.044760	1.174442	1.014405	1.150422	1.001153	1.089753	1.106773	1.068612	Avg:A Wt:C2	1.085448		RSD=5.1	
	101.5	101.6	96.3	108.2	93.5	106	92.2	100.4	102	98.4	Org:N Dep:R				
31 11Cl-PF3OUDS	3.627631	3.379456	3.974755	3.602260	3.543763	3.947726	3.748874	3.564171	3.786684	3.832500	Avg:A Wt:C2	3.700782		RSD=5.1	
	98	91.3	107.4	97.3	95.8	106.7	101.3	96.3	102.3	103.6	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 62 d9-EtFOSE	98.3620	103	109	105	113	101	95.3960	104	93.4850	92.0110	Avg:A Wt:C2	101		RSD=6.7	
	97	101.2	107.4	103.3	111.7	100	94.1	102.3	92.2	90.7	Org:N Dep:R				
33 EtFOSE	1.164067	1.065908	1.104583	1.114789	1.028676	1.128076	1.151925	1.039416	1.218766	1.134070	Avg:A Wt:C2	1.115028		RSD=5.2	
	104.4	95.6	99.1	100	92.3	101.2	103.3	93.2	109.3	101.7	Org:N Dep:R				
D 59 d5-EtFOSA	41.1530	44.6370	46.9080	48.1850	52.3950	42.3620	42.7700	46.3100	42.7690	44.0920	Avg:A Wt:C2	45.1581		RSD=7.5	
	91.1	98.8	103.9	106.7	116	93.8	94.7	102.6	94.7	97.6	Org:N Dep:R				
27 EtFOSA	1.325298	1.382261	1.166645	1.122175	1.128390	1.163224	1.201833	1.097132	1.222071	1.131290	Avg:A Wt:C2	1.194032		RSD=7.8	
	111	115.8	97.7	94	94.5	97.4	100.7	91.9	102.3	94.7	Org:N Dep:R				
D 38 13C2_PFDoA	772	791	823	823	860	735	714	743	735	743	Avg:A Wt:C2	774		RSD=6.2	
	99.7	102.3	106.3	106.3	111.2	95	92.3	96	95	96	Org:N Dep:R				
11 PFDoA	1.213925	1.169506	1.156292	1.186079	1.122725	1.213226	1.219966	1.105106	1.083295	0.978183	Avg:A Wt:C2	1.144830		RSD=6.6	
	106	102.2	101	103.6	98.1	106	106.6	96.5	94.6	85.4	Org:N Dep:R				
4 10:2 FTS	3.326694	2.965016	3.119871	3.373746	3.105579	3.350025	3.236389	2.960178	3.196222	3.063379	Avg:A Wt:C2	3.169710		RSD=4.8	
	105	93.5	98.4	106.4	98	105.7	102.1	93.4	100.8	96.6	Org:N Dep:R				
34 PFDOS	0.930718	0.968620	1.028477	1.009621	0.991563	1.050085	0.978302	1.025176	1.025841	1.066325	Avg:A Wt:C2	1.007473		RSD=4.0	
	92.4	96.1	102.1	100.2	98.4	104.2	97.1	101.8	101.8	105.8	Org:N Dep:R				
24 PFTrDA	1.063088	1.072858	1.034995	0.960298	0.972121	1.029230	1.009993	0.943323	0.948024	0.883879	Avg:A Wt:C2	0.991781		RSD=6.1	
	107.2	108.2	104.4	96.8	98	103.8	101.8	95.1	95.6	89.1	Org:N Dep:R				
D 42 13C2_PFTeDA	955	989	1003	984	1087	937	909	964	967	958	Avg:A Wt:C2	975		RSD=4.9	
	98	101.4	102.8	100.9	111.4	96	93.2	98.9	99.1	98.3	Org:N Dep:R				
23 PFTeDA	0.997234	0.959420	0.947518	0.924693	0.907300	0.929335	0.914840	0.865370	0.861773	0.830621	Avg:A Wt:C2	0.913810		RSD=5.5	
	109.1	105	103.7	101.2	99.3	101.7	100.1	94.7	94.3	90.9	Org:N Dep:R				
35 PFHxDA	0.812378	0.718235	0.674400	0.660462	0.643915	0.657707	0.645663	0.622668	0.625637	0.590894	Avg:A Wt:C2	0.665196		RSD=9.3	
	122.1	108	101.4	99.3	96.8	98.9	97.1	93.6	94.1	88.8	Org:N Dep:R				
D 40 13C2_PFHxDA	995	1011	1049	1029	1111	998	967	1000	998	1000	Avg:A Wt:C2	1016		RSD=3.9	
	97.9	99.5	103.2	101.3	109.4	98.2	95.2	98.5	98.2	98.4	Org:N Dep:R				
36 PFODA	0.980117	0.959655	0.919907	0.935180	0.910503	0.901503	0.891044	0.827583	0.830589	0.787211	Avg:A Wt:C2	0.894329		RSD=6.9	
	109.6	107.3	102.9	104.6	101.8	100.8	99.6	92.5	92.9	88	Org:N Dep:R				

Pace Environmental Services, LLC
Initial Calibration Ion Suppression Report

Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 16-Sep-2021 17:50:57 Cal End Date: 16-Sep-2021 19:26:41
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	091621013.d	F.L. ICAL 50_SVLC-1639	16-Sep-2021 17:50:57
2	091621014.d	F.L. ICAL 100_SVLC-1640	16-Sep-2021 18:01:36
3	091621015.d	F.L. ICAL 200_SVLC-1641	16-Sep-2021 18:12:14
4	091621016.d	F.L. ICAL 500_SVLC-1642	16-Sep-2021 18:22:54
5	091621017.d	F.L. ICAL 1000_SVLC-1638	16-Sep-2021 18:33:27
6	091621018.d	F.L. ICAL 2000_SVLC-1644	16-Sep-2021 18:44:07
7	091621019.d	F.L. ICAL 5000_SVLC-1645	16-Sep-2021 18:54:42
8	091621020.d	F.L. ICAL 10000_SVLC-1646	16-Sep-2021 19:05:23
9	091621021.d	F.L. ICAL 15000_SVLC-1647	16-Sep-2021 19:16:01
10	091621022.d	F.L. ICAL 20000_SVLC-1648	16-Sep-2021 19:26:41

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	743182	783215	786288	790347	881010	730588	752486	726927	706882	652673	3.24
* 39 13C2_PFHxA	718004	719577	730894	693017	798058	678807	656971	678727	665995	678168	1.42
* 41 13C2_PFOA	580611	631131	604949	614444	694913	566624	552835	560283	548948	532397	2.16
* 43 13C3_PFBA	593327	625094	612160	611072	674239	569457	554025	561300	550717	553031	1.75
* 48 13C4_PFOS	138589	143298	139755	138276	149836	126041	131651	136212	130649	134232	0.79

13C2_PFDA ((|652673 - 743182| / (652673 + 743182)) / 2) * 100 = 3.24
13C2_PFHxA ((|678168 - 718004| / (678168 + 718004)) / 2) * 100 = 1.43
13C2_PFOA ((|532397 - 580611| / (532397 + 580611)) / 2) * 100 = 2.17
13C3_PFBA ((|553031 - 593327| / (553031 + 593327)) / 2) * 100 = 1.76
13C4_PFOS ((|134232 - 138589| / (134232 + 138589)) / 2) * 100 = 0.80

Report Date: 17-Sep-2021 15:03:08 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Initial Calibration Response Report

Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b
Method: LCMSMS02_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS02.i Integrator: picker
Cal Start Date: 16-Sep-2021 17:50:57 Cal End Date: 16-Sep-2021 19:26:41
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	091621013.d	F.L. ICAL 50_SVLC-1639	16-Sep-2021 17:50:57
2	091621014.d	F.L. ICAL 100_SVLC-1640	16-Sep-2021 18:01:36
3	091621015.d	F.L. ICAL 200_SVLC-1641	16-Sep-2021 18:12:14
4	091621016.d	F.L. ICAL 500_SVLC-1642	16-Sep-2021 18:22:54
5	091621017.d	F.L. ICAL 1000_SVLC-1638	16-Sep-2021 18:33:27
6	091621018.d	F.L. ICAL 2000_SVLC-1644	16-Sep-2021 18:44:07
7	091621019.d	F.L. ICAL 5000_SVLC-1645	16-Sep-2021 18:54:42
8	091621020.d	F.L. ICAL 10000_SVLC-1646	16-Sep-2021 19:05:23
9	091621021.d	F.L. ICAL 15000_SVLC-1647	16-Sep-2021 19:16:01
10	091621022.d	F.L. ICAL 20000_SVLC-1648	16-Sep-2021 19:26:41

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	644350	666024	676210	659272	701901	622867	590931	595271	604679	595700	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	36343	75333	154510	361237	753997	1377038	3269924	6378473	9955096	12629318	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	603819	616420	613812	618595	675625	596637	558072	595387	555864	550447	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	37240	76153	142882	352035	772389	1429370	3258767	6743428	9627926	12248514	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	193128	192398	200458	195090	215935	188533	178717	185016	173161	175448	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	10949	24889	45335	112169	225386	441171	999683	2078798	3162120	4066183	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	2582	4423	11195	25518	46930	94992	208370	427646	694908	879701	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	110537	113448	102931	106990	113488	107187	98338	101444	96890	106365	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	679889	721798	739495	688642	781501	686967	623443	645108	631207	632842	
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	37881	85781	173475	409970	799054	1529394	3454385	6979236	10630759	13342241	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	718004	719577	730894	693017	798058	678807	656971	678727	665995	678168	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	9905	16494	35393	85391	175269	335717	780347	1617295	2426371	3214272	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	17471	35182	71745	172175	353487	671229	1582321	3041852	4872380	6044383	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1202622	1232381	1239576	1227124	1356476	1197619	1123082	1143164	1112730	1100213	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	37013	66688	139122	332090	712847	1293796	2992149	6035921	9488220	11866676	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	574849	589632	579522	573185	612258	526274	523071	541554	529950	516861	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	133899	146609	145565	150459	155449	133582	129916	137844	125420	125024	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	6846	14794	28775	77326	164913	296308	692175	1370145	2091174	2733270	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	51056	107338	222851	522785	1120826	1994591	4966658	9600067	14502711	18142925	
2 6:2 FTS	Disabled	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	Disabled	9034	12722	25987	57394	101577	241938	434554	715990	858837	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	110647	117508	108794	107828	121867	106157	100503	94041	98339	100438	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	580611	631131	604949	614444	694913	566624	552835	560283	548948	532397	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	585648	589368	594583	584651	638893	593469	559229	529208	521525	502717	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	38318	71085	132789	310911	690996	1257925	3089565	5625002	8525459	10562147	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	7608	14495	31119	77860	154988	292786	689765	1320995	2046055	2597581	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	138589	143298	139755	138276	149836	126041	131651	136212	130649	134232	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	711515	730178	695480	697656	733051	647343	659303	624093	627257	619041	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	146692	146178	136656	147533	153883	128473	130670	128950	130774	127924	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	10271	17407	34614	86616	169097	304268	747748	1486428	2236356	2937776	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	40491	95656	168284	422342	837904	1552320	3623897	7040579	10836684	13357613	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	27675	53655	118108	287926	577880	1068060	2596798	5110822	8026322	10457863	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	272494	292270	289918	291048	307704	262148	268074	259668	257133	263341	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	17222	33101	73277	157860	338001	633411	1480282	3004421	4581595	5999996	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	6602	14721	29894	65945	133502	244854	528045	1156897	1760092	2305292	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	679513	657155	709317	703099	760550	661175	590742	621981	634431	582980	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	2442	6286	10017	25108	56085	96231	237195	438973	641685	837209	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	109045	113565	113298	111423	120707	105830	98416	106016	95895	96136	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	743182	783215	786288	790347	881010	730588	752486	726927	706882	652673	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	44261	92781	167787	453343	876051	1633089	4242479	7558158	11006151	13636367	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	751053	737551	781451	782529	819099	737602	724534	687093	752771	728901	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	6051	13030	24630	63032	130503	234124	601207	1128623	1739174	2193748	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	89585	95261	87611	87893	93575	87997	80001	83335	82703	88482	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	5861	12509	26211	54488	130897	239781	554994	1087145	1718049	2137618	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	6686	9981	22710	54852	109873	198688	485994	972259	1466666	1845406	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	52071	49276	47830	50153	53750	50955	46229	46157	48002	56661	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	624945	661616	682334	659496	746635	590494	601092	560178	541911	520600	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	714387	746261	738506	777634	776873	714408	682557	657635	626462	611611	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	3131	5571	11587	27380	59576	105233	239238	479166	770466	893077	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	41919	74908	146652	357078	777535	1436352	3395003	6587409	9644591	11500046	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	6886	14586	28515	77454	151478	271727	601785	1220911	1799317	2225278	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	25064	46535	102334	250314	513696	955520	2307266	4329431	6997173	9236662	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	98362	102673	108928	104775	113265	101381	95396	103779	93485	92011	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	5725	10944	24064	58401	116513	228731	549445	1078696	1709045	2086938	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	41153	44637	46908	48185	52395	42362	42770	46310	42769	44092	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	2727	6170	10945	27036	59122	98553	257012	508082	784001	997617	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	771959	791428	822772	822805	860250	735249	714173	742686	735431	742672	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	46855	92558	190273	487956	965824	1784046	4356334	8207468	11950335	14529381	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	3497	6492	13630	36238	72274	136708	307046	605057	886403	1135596	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	6608	13706	27210	72093	147702	261181	618720	1279661	1947906	2640869	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	41033	84909	170313	395069	836267	1513481	3606547	7005931	10458094	13128647	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	955443	989129	1002688	983689	1086817	936617	908500	964222	966796	958149	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	47640	94899	190013	454805	986069	1740861	4155661	8344091	12497385	15917168	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	40401	72609	141444	339892	715380	1312488	3120662	6228322	9364347	11815202	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	994636	1010936	1048666	1029256	1110985	997775	966653	1000264	997846	999773	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	48743	97015	192935	481270	1011555	1798995	4306651	8278014	12432003	15740641	

Report Date: 17-Sep-2021 15:03:09 AIM Revision: 2.0.2021.0812

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b

Method: LCMSMS02_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS02.i Integrator: picker

Cal Start Date: 16-Sep-2021 17:50:57 Cal End Date: 16-Sep-2021 19:26:41

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Batch: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	091621013.d	F.L. ICAL 50_SVLC-1639	16-Sep-2021 17:50:57
2	091621014.d	F.L. ICAL 100_SVLC-1640	16-Sep-2021 18:01:36
3	091621015.d	F.L. ICAL 200_SVLC-1641	16-Sep-2021 18:12:14
4	091621016.d	F.L. ICAL 500_SVLC-1642	16-Sep-2021 18:22:54
5	091621017.d	F.L. ICAL 1000_SVLC-1638	16-Sep-2021 18:33:27
6	091621018.d	F.L. ICAL 2000_SVLC-1644	16-Sep-2021 18:44:07
7	091621019.d	F.L. ICAL 5000_SVLC-1645	16-Sep-2021 18:54:42
8	091621020.d	F.L. ICAL 10000_SVLC-1646	16-Sep-2021 19:05:23
9	091621021.d	F.L. ICAL 15000_SVLC-1647	16-Sep-2021 19:16:01
10	091621022.d	F.L. ICAL 20000_SVLC-1648	16-Sep-2021 19:26:41

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.715	1.712	1.718	1.718	1.715	1.718	1.718	1.718	1.715	1.718	1.716	0.118
8 PFBA	1.715	1.718	1.718	1.718	1.715	1.718	1.724	1.718	1.722	1.724	1.719	0.192
D 50 13C5_PFPeA	2.104	2.099	2.098	2.098	2.104	2.099	2.109	2.109	2.104	2.109	2.103	0.218
21 PFPeA	2.104	2.099	2.098	2.098	2.104	2.099	2.109	2.109	2.104	2.109	2.103	0.218
D 44 13C3_PFBS	2.157	2.152	2.151	2.151	2.157	2.162	2.162	2.162	2.157	2.162	2.157	0.209
7 PFBS	2.157	2.152	2.151	2.151	2.157	2.162	2.162	2.162	2.168	2.162	2.158	0.256
1 4:2 FTS	2.441	2.434	2.433	2.433	2.432	2.434	2.433	2.442	2.441	2.434	2.435	0.169
D 63 13C2_4:2 FTS_2	2.432	2.434	2.433	2.424	2.432	2.434	2.433	2.433	2.432	2.434	2.432	0.114
D 49 13C5_PFHxA	2.468	2.469	2.469	2.460	2.468	2.469	2.478	2.478	2.477	2.478	2.471	0.232
15 PFHxA	2.468	2.469	2.469	2.469	2.468	2.478	2.478	2.478	2.477	2.478	2.473	0.185
* 39 13C2_PFHxA	2.468	2.469	2.469	2.469	2.477	2.469	2.469	2.478	2.477	2.478	2.472	0.171
22 PFPeS	2.504	2.496	2.496	2.496	2.504	2.505	2.505	2.514	2.513	2.514	2.504	0.284
28 GenX	2.590	2.591	2.591	2.583	2.590	2.591	2.591	2.598	2.598	2.591	2.591	0.171
D 66 13C3_GenX	2.590	2.583	2.591	2.583	2.590	2.591	2.591	2.598	2.598	2.591	2.590	0.194
13 PFHpA	2.853	2.846	2.854	2.845	2.853	2.855	2.854	2.854	2.862	2.855	2.853	0.171
D 47 13C4_PFHpA	2.844	2.846	2.854	2.845	2.853	2.855	2.854	2.854	2.853	2.855	2.851	0.154
D 45 13C3_PFHxS	2.862	2.864	2.864	2.864	2.872	2.873	2.872	2.873	2.872	2.873	2.868	0.161
14 PFHxS	2.862	2.864	2.864	2.864	2.872	2.873	2.872	2.873	2.872	2.873	2.868	0.161
29 ADONA	2.887	2.889	2.888	2.888	2.895	2.896	2.896	2.896	2.903	2.896	2.893	0.175
2 6:2 FTS	Disabled	3.215	3.214	3.221	3.218	3.221	3.221	3.221	3.218	3.221	3.218	0.082
D 64 13C2_6:2 FTS_2	3.211	3.208	3.214	3.214	3.218	3.221	3.221	3.214	3.225	3.221	3.216	0.161
* 41 13C2_PFOA	3.245	3.235	3.241	3.241	3.245	3.248	3.248	3.248	3.245	3.241	3.244	0.136
D 53 13C8_PFOA	3.238	3.235	3.241	3.241	3.245	3.248	3.248	3.241	3.252	3.241	3.243	0.165
20 PFOA	3.245	3.235	3.241	3.248	3.245	3.248	3.248	3.248	3.252	3.248	3.246	0.154
12 PFHpS	3.245	3.242	3.255	3.248	3.252	3.255	3.255	3.248	3.252	3.248	3.250	0.142
* 48 13C4_PFOS	3.622	3.617	3.625	3.625	3.622	3.632	3.632	3.617	3.629	3.632	3.624	0.157
D 56 13C9_PFNA	3.635	3.625	3.632	3.632	3.628	3.632	3.639	3.625	3.643	3.639	3.632	0.162
D 54 13C8_PFOS	3.622	3.617	3.625	3.625	3.628	3.632	3.632	3.617	3.629	3.625	3.624	0.146
18 PFOS	3.628	3.617	3.632	3.625	3.628	3.632	3.632	3.625	3.629	3.632	3.627	0.125
17 PFNA	3.635	3.625	3.632	3.632	3.635	3.639	3.639	3.632	3.643	3.632	3.634	0.134
30 9Cl-PF3ONS	3.842	3.831	3.846	3.838	3.842	3.838	3.846	3.838	3.843	3.838	3.840	0.126
D 55 13C8_PFOSA	3.867	3.872	3.879	3.871	3.875	3.871	3.879	3.863	3.876	3.871	3.872	0.136

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
19 PFOSA	3.867	3.863	3.879	3.871	3.875	3.871	3.879	3.871	3.876	3.871	3.872	0.132
16 PFNS	3.978	3.974	3.984	3.974	3.978	3.984	3.984	3.974	3.979	3.984	3.979	0.118
D 51 13C6_PFDA	3.989	3.985	3.995	3.995	3.989	3.995	3.995	3.984	4.001	3.995	3.992	0.126
3 8:2 FTS	3.989	3.985	3.995	3.995	3.989	3.984	3.995	3.984	3.990	3.995	3.990	0.108
D 65 13C2_8:2 FTS_2	3.989	3.985	3.995	3.984	3.989	3.995	3.995	3.974	3.990	3.995	3.988	0.166
* 37 13C2_PFDA	3.989	3.985	3.995	3.995	3.989	3.995	3.995	3.984	4.001	3.995	3.992	0.126
10 PFDA	3.989	3.985	3.995	3.995	3.999	3.995	3.995	3.984	4.001	3.995	3.993	0.134
D 58 d3-MeFOSAA	4.154	4.152	4.160	4.151	4.154	4.151	4.160	4.151	4.155	4.151	4.153	0.080
6 N-MeFOSAA	4.154	4.143	4.169	4.160	4.154	4.160	4.160	4.151	4.164	4.160	4.157	0.175
D 61 d7-MeFOSE	4.290	4.288	4.298	4.287	4.280	4.288	4.287	4.277	4.292	4.288	4.287	0.131
9 PFDS	4.290	4.288	4.298	4.298	4.290	4.288	4.297	4.287	4.292	4.298	4.292	0.102
32 MeFOSE	4.310	4.298	4.298	4.298	4.300	4.298	4.297	4.297	4.302	4.298	4.299	0.097
D 57 d3-MeFOSA	4.310	4.309	4.318	4.308	4.310	4.308	4.308	4.308	4.312	4.308	4.309	0.076
D 60 d5-EtFOSAA	4.310	4.309	4.318	4.318	4.310	4.318	4.318	4.308	4.322	4.318	4.314	0.116
D 52 13C7_PFUdA	4.310	4.309	4.318	4.318	4.310	4.318	4.318	4.308	4.322	4.318	4.314	0.116
26 MeFOSA	4.310	4.309	4.318	4.308	4.310	4.308	4.308	4.308	4.312	4.308	4.309	0.076
25 PFUdA	4.310	4.309	4.318	4.318	4.310	4.318	4.318	4.318	4.322	4.318	4.315	0.101
5 N-EtFOSAA	4.321	4.329	4.328	4.318	4.321	4.328	4.328	4.318	4.332	4.328	4.324	0.124
31 11Cl-PF3OUDS	4.459	4.456	4.464	4.455	4.459	4.455	4.464	4.455	4.460	4.464	4.458	0.090
D 62 d9-EtFOSE	4.459	4.456	4.455	4.455	4.459	4.455	4.455	4.446	4.451	4.455	4.454	0.086
33 EtFOSE	4.468	4.465	4.473	4.464	4.468	4.464	4.464	4.464	4.469	4.464	4.466	0.070
D 59 d5-EtFOSA	4.477	4.474	4.482	4.482	4.477	4.473	4.473	4.473	4.478	4.473	4.476	0.079
27 EtFOSA	4.486	4.483	4.482	4.482	4.486	4.482	4.482	4.482	4.487	4.482	4.483	0.043
D 38 13C2_PFDoA	4.591	4.598	4.605	4.597	4.600	4.597	4.597	4.597	4.601	4.605	4.598	0.094
11 PFDoA	4.600	4.598	4.605	4.597	4.600	4.597	4.597	4.597	4.601	4.597	4.598	0.063
4 10:2 FTS	4.600	4.598	4.614	4.614	4.617	4.614	4.613	4.614	4.618	4.614	4.611	0.149
34 PFDOS	4.812	4.816	4.825	4.825	4.821	4.825	4.825	4.825	4.830	4.825	4.822	0.107
24 PFTrDA	4.856	4.851	4.860	4.851	4.856	4.859	4.859	4.860	4.857	4.860	4.856	0.071
D 42 13C2_PFTeDA	5.085	5.087	5.087	5.087	5.085	5.087	5.087	5.087	5.091	5.087	5.087	0.031
23 PFTeDA	5.085	5.081	5.087	5.087	5.085	5.087	5.093	5.087	5.091	5.087	5.087	0.068
35 PFHxDA	5.531	5.528	5.528	5.528	5.532	5.536	5.536	5.536	5.539	5.536	5.533	0.072
D 40 13C2_PFHxDA	5.523	5.528	5.528	5.528	5.532	5.528	5.536	5.536	5.539	5.536	5.531	0.090
36 PFODA	5.976	5.978	5.978	5.978	5.986	5.982	5.987	5.988	5.990	5.988	5.983	0.088

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b\091621024.d
Injection Date: 16-Sep-2021 19:47:57 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 12
Sample Info: F.L. ICV 500_SVLC-1651 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	447.03	89.4	70 - 130
D 46 13C4_PFBA	701901	654081			93.2	50 - 150
D 50 13C5_PFPeA	675625	599481			88.7	50 - 150
21 PFPeA			500.00	463.22	92.6	70 - 130
D 44 13C3_PFBS	215935	190285			88.1	50 - 150
7 PFBS			442.50	381.05	86.1	70 - 130
D 63 13C2_4:2 FTS_2	113488	103972			91.6	50 - 150
1 4:2 FTS			467.50	442.90	94.7	70 - 130
D 49 13C5_PFHxA	781501	693016			88.7	50 - 150
15 PFHxA			500.00	452.92	90.6	70 - 130
22 PFPeS			470.00	434.16	92.4	70 - 130
D 66 13C3_GenX	1356476	1217286			89.7	50 - 150
28 GenX			2500.00	2283.54	91.3	70 - 130
13 PFHpA			500.00	440.26	88.1	70 - 130
D 47 13C4_PFHpA	612258	582285			95.1	50 - 150
D 45 13C3_PFHxS	155449	146828			94.5	50 - 150
14 PFHxS			456.00	383.49	84.1	70 - 130
29 ADONA			2355.00	2020.60	85.8	70 - 130
2 6:2 FTS			475.00	375.44	79	70 - 130
D 64 13C2_6:2 FTS_2	121867	108633			89.1	50 - 150
20 PFOA			500.00	406.39	81.3	70 - 130
D 53 13C8_PFOA	638893	600426			94	50 - 150
12 PFHpS			475.00	405.40	85.3	70 - 130
D 54 13C8_PFOS	153883	144737			94.1	50 - 150
18 PFOS			462.75	391.91	84.7	70 - 130
D 56 13C9_PFNA	733051	679474			92.7	50 - 150
17 PFNA			500.00	461.49	92.3	70 - 130
30 9Cl-PF3ONS			2330.00	1904.08	81.7	70 - 130
19 PFOSA			500.00	452.05	90.4	70 - 130
D 55 13C8_PFOSA	307704	285301			92.7	50 - 150
16 PFNS			480.00	440.33	91.7	70 - 130
3 8:2 FTS			480.00	395.75	82.4	70 - 130
D 51 13C6_PFDA	760550	668758			87.9	50 - 150
D 65 13C2_8:2 FTS_2	120707	110321			91.4	50 - 150
10 PFDA			500.00	451.61	90.3	70 - 130
6 N-MeFOSAA			500.00	551.52	110.3	70 - 130

Report Date: 17-Sep-2021 15:02:31 AIM Revision: 2.0.2021.0812
Data File: \\organics\LL\LCMSMS02.i\091621-DOD+ICAL.b\091621024.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	819099	742023			90.6	50 - 150
D 61 d7-MeFOSE	93575	87716			93.7	50 - 150
9 PFDS			482.50	443.77	92	70 - 130
25 PFUdA			500.00	452.87	90.6	70 - 130
D 60 d5-EtFOSAA	746635	697593			93.4	50 - 150
D 52 13C7_PFUdA	776873	742036			95.5	50 - 150
D 57 d3-MeFOSA	53750	49475			92	50 - 150
5 N-EtFOSAA			500.00	485.35	97.1	70 - 130
D 62 d9-EtFOSE	113265	105323			93	50 - 150
31 11Cl-PF3OUDS			2355.00	1918.39	81.5	70 - 130
D 59 d5-EtFOSA	52395	47427			90.5	50 - 150
D 38 13C2_PFDoA	860250	798165			92.8	50 - 150
11 PFDoA			500.00	392.25	78.5	70 - 130
4 10:2 FTS			2410.00	2341.25	97.1	70 - 130
24 PFTrDA			500.00	456.27	91.3	70 - 130
23 PFTeDA			500.00	445.79	89.2	70 - 130
D 42 13C2_PFTeDA	1086817	1011130			93	50 - 150
D 40 13C2_PFHxDA	1110985	1006488			90.6	50 - 150

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321005.d
Injection Date: 13-Sep-2021 13:08:08 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1640 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1396762	1091439			78.1	50 - 150
8 PFBA			100.00	92.095	92.1	70 - 130
21 PFPeA			100.00	101.84	101.8	70 - 130
D 50 13C5_PFPeA	1261998	1030489			81.7	50 - 150
7 PFBS			88.400	101.72	115.1	70 - 130
D 44 13C3_PFBS	432892	339082			78.3	50 - 150
D 63 13C2_4:2 FTS_2	402503	293026			72.8	50 - 150
1 4:2 FTS			93.400	116.48	124.7	70 - 130
D 49 13C5_PFHxA	1190951	937890			78.8	50 - 150
15 PFHxA			100.00	111.65	111.7	70 - 130
22 PFPeS			93.800	105.74	112.7	70 - 130
28 GenX			200.00	228.30	114.1	70 - 130
D 66 13C3_GenX	811984	734336			90.4	50 - 150
D 47 13C4_PFHpA	1173534	949410			80.9	50 - 150
13 PFHpA			100.00	113.13	113.1	70 - 130
14 PFHxS			91.000	107.51	118.1	70 - 130
D 45 13C3_PFHxS	327704	265771			81.1	50 - 150
29 ADONA			94.200	108.29	115	70 - 130
D 64 13C2_6:2 FTS_2	343038	264265			77	50 - 150
2 6:2 FTS			94.800	152.95	161.3	70 - 130
D 53 13C8_PFOA	1292395	1028666			79.6	50 - 150
20 PFOA			100.00	108.61	108.6	70 - 130
12 PFHpS			95.200	97.992	102.9	70 - 130
D 54 13C8_PFOS	263760	225102			85.3	50 - 150
18 PFOS			92.800	102.32	110.3	70 - 130
17 PFNA			100.00	104.08	104.1	70 - 130
D 56 13C9_PFNA	1108913	982923			88.6	50 - 150
30 9Cl-PF3ONS			93.200	90.769	97.4	70 - 130
19 PFOSA			100.00	122.05	122	70 - 130
D 55 13C8_PFOSA	530495	452820			85.4	50 - 150
16 PFNS			96.000	99.448	103.6	70 - 130
D 51 13C6_PFDA	1049020	875878			83.5	50 - 150
D 65 13C2_8:2 FTS_2	269579	258098			95.7	50 - 150
10 PFDA			100.00	103.22	103.2	70 - 130
3 8:2 FTS			95.800	69.663	72.7	70 - 130
D 58 d3-MeFOSAA	1513550	1285181			84.9	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	106.80	106.8	70 - 130
9 PFDS			96.400	119.54	124	70 - 130
D 61 d7-MeFOSE	158186	133337			84.3	50 - 150
32 MeFOSE			100.00	108.87	108.9	70 - 130
25 PFUdA			100.00	109.58	109.6	70 - 130
D 60 d5-EtFOSAA	1327547	1161938			87.5	50 - 150
D 52 13C7_PFUdA	925180	779048			84.2	50 - 150
D 57 d3-MeFOSA	81022	63811			78.8	50 - 150
5 N-EtFOSAA			100.00	127.21	127.2	70 - 130
26 MeFOSA			100.00	106.68	106.7	70 - 130
31 11Cl-PF3OUDS			94.200	108.02	114.7	70 - 130
D 62 d9-EtFOSE	137302	146078			106.4	50 - 150
33 EtFOSE			100.00	116.41	116.4	70 - 130
D 59 d5-EtFOSA	67463	59663			88.4	50 - 150
27 EtFOSA			100.00	122.71	122.7	70 - 130
D 38 13C2_PFDoA	963591	900680			93.5	50 - 150
11 PFDoA			100.00	112.03	112	70 - 130
4 10:2 FTS			96.400	117.07	121.4	70 - 130
34 PFDOS			96.800	124.57	128.7	70 - 130
24 PFTrDA			100.00	100.90	100.9	70 - 130
23 PFTeDA			100.00	114.62	114.6	70 - 130
D 42 13C2_PFTeDA	1116045	946027			84.8	50 - 150
35 PFHxDA			100.00	104.89	104.9	70 - 130
D 40 13C2_PFHxDA	573502	527761			92	50 - 150
36 PFODA			100.00	116.08	116.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321006.d
Injection Date: 13-Sep-2021 13:18:40 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1641 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1091439	1063903			97.5	50 - 150
8 PFBA			200.00	203.36	101.7	70 - 130
21 PFPeA			200.00	226.81	113.4	70 - 130
D 50 13C5_PFPeA	1030489	996521			96.7	50 - 150
7 PFBS			176.80	182.08	103	70 - 130
D 44 13C3_PFBS	339082	351099			103.5	50 - 150
D 63 13C2_4:2 FTS_2	293026	298590			101.9	50 - 150
1 4:2 FTS			186.80	224.85	120.4	70 - 130
D 49 13C5_PFHxA	937890	914637			97.5	50 - 150
15 PFHxA			200.00	232.20	116.1	70 - 130
22 PFPeS			187.60	205.39	109.5	70 - 130
28 GenX			400.00	361.33	90.3	70 - 130
D 66 13C3_GenX	734336	730615			99.5	50 - 150
D 47 13C4_PFHpA	949410	996713			105	50 - 150
13 PFHpA			200.00	223.23	111.6	70 - 130
14 PFHxS			182.00	175.70	96.5	70 - 130
D 45 13C3_PFHxS	265771	309993			116.6	50 - 150
29 ADONA			188.40	161.25	85.6	70 - 130
D 64 13C2_6:2 FTS_2	264265	291347			110.2	50 - 150
2 6:2 FTS			189.60	172.04	90.7	70 - 130
D 53 13C8_PFOA	1028666	1008110			98	50 - 150
20 PFOA			200.00	229.68	114.8	70 - 130
12 PFHpS			190.40	183.72	96.5	70 - 130
D 54 13C8_PFOS	225102	234291			104.1	50 - 150
18 PFOS			185.60	175.00	94.3	70 - 130
17 PFNA			200.00	211.95	106	70 - 130
D 56 13C9_PFNA	982923	983042			100	50 - 150
30 9Cl-PF3ONS			186.40	177.45	95.2	70 - 130
19 PFOSA			200.00	244.61	122.3	70 - 130
D 55 13C8_PFOSA	452820	455979			100.7	50 - 150
16 PFNS			192.00	204.99	106.8	70 - 130
D 51 13C6_PFDA	875878	881649			100.7	50 - 150
D 65 13C2_8:2 FTS_2	258098	227983			88.3	50 - 150
10 PFDA			200.00	261.08	130.5	70 - 130
3 8:2 FTS			191.60	197.17	102.9	70 - 130
D 58 d3-MeFOSAA	1285181	1232143			95.9	50 - 150

Report Date: 27-Sep-2021 19:01:26 AIM Revision: 2.0.2021.0812
Data File: \\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321006.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	178.53	89.3	70 - 130
9 PFDS			192.80	200.96	104.2	70 - 130
D 61 d7-MeFOSE	133337	134119			100.6	50 - 150
32 MeFOSE			200.00	218.93	109.5	70 - 130
25 PFUdA			200.00	217.02	108.5	70 - 130
D 60 d5-EtFOSAA	1161938	1098139			94.5	50 - 150
D 52 13C7_PFUdA	779048	771405			99	50 - 150
D 57 d3-MeFOSA	63811	62131			97.4	50 - 150
5 N-EtFOSAA			200.00	257.18	128.6	70 - 130
26 MeFOSA			200.00	228.54	114.3	70 - 130
31 11Cl-PF3OUDS			188.40	186.54	99	70 - 130
D 62 d9-EtFOSE	146078	132961			91	50 - 150
33 EtFOSE			200.00	236.27	118.1	70 - 130
D 59 d5-EtFOSA	59663	70532			118.2	50 - 150
27 EtFOSA			200.00	201.82	100.9	70 - 130
D 38 13C2_PFDoA	900680	755255			83.9	50 - 150
11 PFDoA			200.00	251.50	125.7	70 - 130
4 10:2 FTS			192.80	159.65	82.8	70 - 130
34 PFDOS			193.60	239.29	123.6	70 - 130
24 PFTrDA			200.00	238.05	119	70 - 130
23 PFTeDA			200.00	225.39	112.7	70 - 130
D 42 13C2_PFTeDA	946027	950318			100.5	50 - 150
35 PFHxDA			200.00	182.72	91.4	70 - 130
D 40 13C2_PFHxDA	527761	530314			100.5	50 - 150
36 PFODA			200.00	236.91	118.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321016.d
Injection Date: 13-Sep-2021 15:10:47 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 9
Sample Info: ID CCV 1000_SVLC-1638 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1091439	1132917			103.8	50 - 150
8 PFBA			1000.00	986.34	98.6	70 - 130
21 PFPeA			1000.00	1070.51	107.1	70 - 130
D 50 13C5_PFPeA	1030489	1087966			105.6	50 - 150
7 PFBS			884.00	966.60	109.3	70 - 130
D 44 13C3_PFBS	339082	339201			100	50 - 150
D 63 13C2_4:2 FTS_2	293026	283757			96.8	50 - 150
1 4:2 FTS			934.00	996.95	106.7	70 - 130
D 49 13C5_PFHxA	937890	1008675			107.5	50 - 150
15 PFHxA			1000.00	932.36	93.2	70 - 130
22 PFPeS			938.00	982.38	104.7	70 - 130
28 GenX			2000.00	1853.73	92.7	70 - 130
D 66 13C3_GenX	734336	788355			107.4	50 - 150
D 47 13C4_PFHpA	949410	986578			103.9	50 - 150
13 PFHpA			1000.00	1093.42	109.3	70 - 130
14 PFHxS			910.00	916.43	100.7	70 - 130
D 45 13C3_PFHxS	265771	277614			104.5	50 - 150
29 ADONA			942.00	1013.73	107.6	70 - 130
D 64 13C2_6:2 FTS_2	264265	277101			104.9	50 - 150
2 6:2 FTS			948.00	920.42	97.1	70 - 130
D 53 13C8_PFOA	1028666	1074063			104.4	50 - 150
20 PFOA			1000.00	939.89	94	70 - 130
12 PFHpS			952.00	951.08	99.9	70 - 130
D 54 13C8_PFOS	225102	242871			107.9	50 - 150
18 PFOS			928.00	857.83	92.4	70 - 130
17 PFNA			1000.00	1055.64	105.6	70 - 130
D 56 13C9_PFNA	982923	1035550			105.4	50 - 150
30 9Cl-PF3ONS			932.00	896.61	96.2	70 - 130
19 PFOSA			1000.00	1082.48	108.2	70 - 130
D 55 13C8_PFOSA	452820	455752			100.6	50 - 150
16 PFNS			960.00	1011.89	105.4	70 - 130
D 51 13C6_PFDA	875878	890383			101.7	50 - 150
D 65 13C2_8:2 FTS_2	258098	205569			79.6	50 - 150
10 PFDA			1000.00	1055.47	105.5	70 - 130
3 8:2 FTS			958.00	832.26	86.9	70 - 130
D 58 d3-MeFOSAA	1285181	1292447			100.6	50 - 150

Report Date: 27-Sep-2021 19:01:29 AIM Revision: 2.0.2021.0812
Data File: \\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321016.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	956.58	95.7	70 - 130
9 PFDS			964.00	921.24	95.6	70 - 130
D 61 d7-MeFOSE	133337	134246			100.7	50 - 150
32 MeFOSE			1000.00	1133.67	113.4	70 - 130
25 PFUdA			1000.00	1084.78	108.5	70 - 130
D 60 d5-EtFOSAA	1161938	1076515			92.6	50 - 150
D 52 13C7_PFUdA	779048	770775			98.9	50 - 150
D 57 d3-MeFOSA	63811	72293			113.3	50 - 150
5 N-EtFOSAA			1000.00	1094.09	109.4	70 - 130
26 MeFOSA			1000.00	881.82	88.2	70 - 130
31 11Cl-PF3OUDS			942.00	911.23	96.7	70 - 130
D 62 d9-EtFOSE	146078	132437			90.7	50 - 150
33 EtFOSE			1000.00	1082.79	108.3	70 - 130
D 59 d5-EtFOSA	59663	59175			99.2	50 - 150
27 EtFOSA			1000.00	990.16	99	70 - 130
D 38 13C2_PFDoA	900680	858870			95.4	50 - 150
11 PFDoA			1000.00	1128.18	112.8	70 - 130
4 10:2 FTS			964.00	953.10	98.9	70 - 130
34 PFDOS			968.00	1074.71	111	70 - 130
24 PFTrDA			1000.00	1055.42	105.5	70 - 130
23 PFTeDA			1000.00	1086.53	108.7	70 - 130
D 42 13C2_PFTeDA	946027	959882			101.5	50 - 150
35 PFHxDA			1000.00	856.84	85.7	70 - 130
D 40 13C2_PFHxDA	527761	563169			106.7	50 - 150
36 PFODA			1000.00	1059.27	105.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321028.d
Injection Date: 13-Sep-2021 17:17:53 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 20
Sample Info: ID CCV 1000A_SVLC-1638 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1091439	1075847			98.6	50 - 150
8 PFBA			1000.00	1050.55	105.1	70 - 130
21 PFPeA			1000.00	1051.25	105.1	70 - 130
D 50 13C5_PFPeA	1030489	1086074			105.4	50 - 150
7 PFBS			884.00	1010.36	114.3	70 - 130
D 44 13C3_PFBS	339082	330058			97.3	50 - 150
D 63 13C2_4:2 FTS_2	293026	294803			100.6	50 - 150
1 4:2 FTS			934.00	1012.50	108.4	70 - 130
D 49 13C5_PFHxA	937890	941717			100.4	50 - 150
15 PFHxA			1000.00	1053.32	105.3	70 - 130
22 PFPeS			938.00	1176.77	125.5	70 - 130
28 GenX			2000.00	1738.36	86.9	70 - 130
D 66 13C3_GenX	734336	809576			110.2	50 - 150
D 47 13C4_PFHpA	949410	979661			103.2	50 - 150
13 PFHpA			1000.00	1067.48	106.7	70 - 130
14 PFHxS			910.00	901.53	99.1	70 - 130
D 45 13C3_PFHxS	265771	279313			105.1	50 - 150
29 ADONA			942.00	880.36	93.5	70 - 130
D 64 13C2_6:2 FTS_2	264265	297933			112.7	50 - 150
2 6:2 FTS			948.00	910.16	96	70 - 130
D 53 13C8_PFOA	1028666	1026760			99.8	50 - 150
20 PFOA			1000.00	1023.65	102.4	70 - 130
12 PFHpS			952.00	1012.60	106.4	70 - 130
D 54 13C8_PFOS	225102	232583			103.3	50 - 150
18 PFOS			928.00	1008.21	108.6	70 - 130
17 PFNA			1000.00	1034.46	103.4	70 - 130
D 56 13C9_PFNA	982923	978996			99.6	50 - 150
30 9Cl-PF3ONS			932.00	888.52	95.3	70 - 130
19 PFOSA			1000.00	1022.98	102.3	70 - 130
D 55 13C8_PFOSA	452820	466140			102.9	50 - 150
16 PFNS			960.00	954.66	99.4	70 - 130
D 51 13C6_PFDA	875878	939167			107.2	50 - 150
D 65 13C2_8:2 FTS_2	258098	232175			90	50 - 150
10 PFDA			1000.00	1069.00	106.9	70 - 130
3 8:2 FTS			958.00	748.82	78.2	70 - 130
D 58 d3-MeFOSAA	1285181	1254041			97.6	50 - 150

Report Date: 27-Sep-2021 19:01:36 AIM Revision: 2.0.2021.0812
Data File: \\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321028.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	830.63	83.1	70 - 130
9 PFDS			964.00	925.80	96	70 - 130
D 61 d7-MeFOSE	133337	142075			106.6	50 - 150
32 MeFOSE			1000.00	928.68	92.9	70 - 130
25 PFUdA			1000.00	1133.08	113.3	70 - 130
D 60 d5-EtFOSAA	1161938	1133888			97.6	50 - 150
D 52 13C7_PFUdA	779048	770696			98.9	50 - 150
D 57 d3-MeFOSA	63811	64443			101	50 - 150
5 N-EtFOSAA			1000.00	953.86	95.4	70 - 130
26 MeFOSA			1000.00	956.17	95.6	70 - 130
31 11Cl-PF3OUDS			942.00	904.76	96	70 - 130
D 62 d9-EtFOSE	146078	148431			101.6	50 - 150
33 EtFOSE			1000.00	1012.84	101.3	70 - 130
D 59 d5-EtFOSA	59663	62435			104.6	50 - 150
27 EtFOSA			1000.00	1001.66	100.2	70 - 130
D 38 13C2_PFDoA	900680	869538			96.5	50 - 150
11 PFDoA			1000.00	1081.15	108.1	70 - 130
4 10:2 FTS			964.00	851.58	88.3	70 - 130
34 PFDOS			968.00	1158.29	119.7	70 - 130
24 PFTrDA			1000.00	1020.05	102	70 - 130
23 PFTeDA			1000.00	1115.84	111.6	70 - 130
D 42 13C2_PFTeDA	946027	1019280			107.7	50 - 150
35 PFHxDA			1000.00	882.93	88.3	70 - 130
D 40 13C2_PFHxDA	527761	570324			108.1	50 - 150
36 PFODA			1000.00	1044.58	104.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321044.d
Injection Date: 13-Sep-2021 20:07:22 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 35
Sample Info: ID CCV 1000B_SVLC-1638 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1091439	1106476			101.4	50 - 150
8 PFBA			1000.00	1030.80	103.1	70 - 130
21 PFPeA			1000.00	1063.06	106.3	70 - 130
D 50 13C5_PFPeA	1030489	1037750			100.7	50 - 150
7 PFBS			884.00	978.17	110.7	70 - 130
D 44 13C3_PFBS	339082	344993			101.7	50 - 150
D 63 13C2_4:2 FTS_2	293026	291515			99.5	50 - 150
1 4:2 FTS			934.00	1049.46	112.4	70 - 130
D 49 13C5_PFHxA	937890	967874			103.2	50 - 150
15 PFHxA			1000.00	1008.37	100.8	70 - 130
22 PFPeS			938.00	1036.46	110.5	70 - 130
28 GenX			2000.00	1808.75	90.4	70 - 130
D 66 13C3_GenX	734336	784550			106.8	50 - 150
D 47 13C4_PFHpA	949410	1015945			107	50 - 150
13 PFHpA			1000.00	1061.09	106.1	70 - 130
14 PFHxS			910.00	904.45	99.4	70 - 130
D 45 13C3_PFHxS	265771	275707			103.7	50 - 150
29 ADONA			942.00	904.91	96.1	70 - 130
D 64 13C2_6:2 FTS_2	264265	345685			130.8	50 - 150
2 6:2 FTS			948.00	794.12	83.8	70 - 130
D 53 13C8_PFOA	1028666	1132696			110.1	50 - 150
20 PFOA			1000.00	1011.19	101.1	70 - 130
12 PFHpS			952.00	989.51	103.9	70 - 130
D 54 13C8_PFOS	225102	251852			111.9	50 - 150
18 PFOS			928.00	828.09	89.2	70 - 130
17 PFNA			1000.00	1076.69	107.7	70 - 130
D 56 13C9_PFNA	982923	1021225			103.9	50 - 150
30 9Cl-PF3ONS			932.00	828.07	88.8	70 - 130
19 PFOSA			1000.00	1028.01	102.8	70 - 130
D 55 13C8_PFOSA	452820	473297			104.5	50 - 150
16 PFNS			960.00	993.93	103.5	70 - 130
D 51 13C6_PFDA	875878	883538			100.9	50 - 150
D 65 13C2_8:2 FTS_2	258098	233019			90.3	50 - 150
10 PFDA			1000.00	1131.12	113.1	70 - 130
3 8:2 FTS			958.00	908.46	94.8	70 - 130
D 58 d3-MeFOSAA	1285181	1249820			97.2	50 - 150

Report Date: 27-Sep-2021 19:01:55 AIM Revision: 2.0.2021.0812
Data File: \\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321044.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	990.12	99	70 - 130
9 PFDS			964.00	974.46	101.1	70 - 130
D 61 d7-MeFOSE	133337	148747			111.6	50 - 150
32 MeFOSE			1000.00	879.65	88	70 - 130
25 PFUdA			1000.00	1006.45	100.6	70 - 130
D 60 d5-EtFOSAA	1161938	1134281			97.6	50 - 150
D 52 13C7_PFUdA	779048	823347			105.7	50 - 150
D 57 d3-MeFOSA	63811	66067			103.5	50 - 150
5 N-EtFOSAA			1000.00	923.15	92.3	70 - 130
26 MeFOSA			1000.00	925.66	92.6	70 - 130
31 11Cl-PF3OUDS			942.00	823.88	87.5	70 - 130
D 62 d9-EtFOSE	146078	125587			86	50 - 150
33 EtFOSE			1000.00	1354.55	135.5	70 - 130
D 59 d5-EtFOSA	59663	57264			96	50 - 150
27 EtFOSA			1000.00	1240.25	124	70 - 130
D 38 13C2_PFDoA	900680	944554			104.9	50 - 150
11 PFDoA			1000.00	950.42	95	70 - 130
4 10:2 FTS			964.00	754.78	78.3	70 - 130
34 PFDOS			968.00	1059.55	109.5	70 - 130
24 PFTrDA			1000.00	944.85	94.5	70 - 130
23 PFTeDA			1000.00	1080.63	108.1	70 - 130
D 42 13C2_PFTeDA	946027	981316			103.7	50 - 150
35 PFHxDA			1000.00	868.55	86.9	70 - 130
D 40 13C2_PFHxDA	527761	586802			111.2	50 - 150
36 PFODA			1000.00	1040.50	104.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321060.d
Injection Date: 13-Sep-2021 22:56:50 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 50
Sample Info: ID CCV 1000C_SVLC-1638 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1091439	1139798			104.4	50 - 150
8 PFBA			1000.00	1015.18	101.5	70 - 130
21 PFPeA			1000.00	1113.55	111.4	70 - 130
D 50 13C5_PFPeA	1030489	1047655			101.7	50 - 150
7 PFBS			884.00	922.42	104.3	70 - 130
D 44 13C3_PFBS	339082	358016			105.6	50 - 150
D 63 13C2_4:2 FTS_2	293026	304483			103.9	50 - 150
1 4:2 FTS			934.00	1011.98	108.3	70 - 130
D 49 13C5_PFHxA	937890	950827			101.4	50 - 150
15 PFHxA			1000.00	1073.16	107.3	70 - 130
22 PFPeS			938.00	984.97	105	70 - 130
28 GenX			2000.00	1750.24	87.5	70 - 130
D 66 13C3_GenX	734336	807792			110	50 - 150
D 47 13C4_PFHpA	949410	1046063			110.2	50 - 150
13 PFHpA			1000.00	1016.85	101.7	70 - 130
14 PFHxS			910.00	867.76	95.4	70 - 130
D 45 13C3_PFHxS	265771	280358			105.5	50 - 150
29 ADONA			942.00	1027.91	109.1	70 - 130
D 64 13C2_6:2 FTS_2	264265	339120			128.3	50 - 150
2 6:2 FTS			948.00	985.95	104	70 - 130
D 53 13C8_PFOA	1028666	1132271			110.1	50 - 150
20 PFOA			1000.00	1010.94	101.1	70 - 130
12 PFHpS			952.00	991.84	104.2	70 - 130
D 54 13C8_PFOS	225102	237580			105.5	50 - 150
18 PFOS			928.00	928.22	100	70 - 130
17 PFNA			1000.00	974.85	97.5	70 - 130
D 56 13C9_PFNA	982923	1116824			113.6	50 - 150
30 9Cl-PF3ONS			932.00	843.66	90.5	70 - 130
19 PFOSA			1000.00	978.60	97.9	70 - 130
D 55 13C8_PFOSA	452820	467747			103.3	50 - 150
16 PFNS			960.00	1025.76	106.8	70 - 130
D 51 13C6_PFDA	875878	862876			98.5	50 - 150
D 65 13C2_8:2 FTS_2	258098	205746			79.7	50 - 150
10 PFDA			1000.00	1082.83	108.3	70 - 130
3 8:2 FTS			958.00	899.98	93.9	70 - 130
D 58 d3-MeFOSAA	1285181	1322824			102.9	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	918.43	91.8	70 - 130
9 PFDS			964.00	936.52	97.1	70 - 130
D 61 d7-MeFOSE	133337	137501			103.1	50 - 150
32 MeFOSE			1000.00	1031.56	103.2	70 - 130
25 PFUdA			1000.00	1008.18	100.8	70 - 130
D 60 d5-EtFOSAA	1161938	1172432			100.9	50 - 150
D 52 13C7_PFUdA	779048	767029			98.5	50 - 150
D 57 d3-MeFOSA	63811	65960			103.4	50 - 150
5 N-EtFOSAA			1000.00	973.35	97.3	70 - 130
26 MeFOSA			1000.00	981.46	98.1	70 - 130
31 11Cl-PF3OUDS			942.00	902.73	95.8	70 - 130
D 62 d9-EtFOSE	146078	130035			89	50 - 150
33 EtFOSE			1000.00	1154.23	115.4	70 - 130
D 59 d5-EtFOSA	59663	59713			100.1	50 - 150
27 EtFOSA			1000.00	1106.21	110.6	70 - 130
D 38 13C2_PFDoA	900680	872620			96.9	50 - 150
11 PFDoA			1000.00	1062.40	106.2	70 - 130
4 10:2 FTS			964.00	977.86	101.4	70 - 130
34 PFDOS			968.00	1128.51	116.6	70 - 130
24 PFTrDA			1000.00	989.30	98.9	70 - 130
23 PFTeDA			1000.00	1143.85	114.4	70 - 130
D 42 13C2_PFTeDA	946027	973390			102.9	50 - 150
35 PFHxDA			1000.00	856.91	85.7	70 - 130
D 40 13C2_PFHxDA	527761	565696			107.2	50 - 150
36 PFODA			1000.00	1016.82	101.7	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521036.d
Injection Date: 15-Sep-2021 18:10:54 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 20
Sample Info: CCV 1000_SVLC-1643 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1193454	1190366			99.7	50 - 150
8 PFBA			1000.00	944.80	94.5	70 - 130
21 PFPeA			1000.00	964.51	96.5	70 - 130
D 50 13C5_PFPeA	1164243	1149118			98.7	50 - 150
D 44 13C3_PFBS	375554	373267			99.4	50 - 150
7 PFBS			884.00	915.71	103.6	70 - 130
D 63 13C2_4:2 FTS_2	327798	576079			175.7	50 - 150
1 4:2 FTS			934.00	805.06	86.2	70 - 130
D 49 13C5_PFHxA	1062655	920714			86.6	50 - 150
15 PFHxA			1000.00	1085.10	108.5	70 - 130
22 PFPeS			938.00	939.99	100.2	70 - 130
28 GenX			2000.00	1964.18	98.2	70 - 130
D 66 13C3_GenX	838617	814570			97.1	50 - 150
D 47 13C4_PFHpA	1056209	1080868			102.3	50 - 150
13 PFHpA			1000.00	1010.66	101.1	70 - 130
D 45 13C3_PFHxS	308635	289606			93.8	50 - 150
14 PFHxS			910.00	864.35	95	70 - 130
29 ADONA			942.00	907.54	96.3	70 - 130
2 6:2 FTS			948.00	893.83	94.3	70 - 130
D 64 13C2_6:2 FTS_2	361571	627076			173.4	50 - 150
D 53 13C8_PFOA	1095338	1112433			101.6	50 - 150
20 PFOA			1000.00	983.20	98.3	70 - 130
12 PFHpS			952.00	886.83	93.2	70 - 130
18 PFOS			928.00	976.75	105.3	70 - 130
D 54 13C8_PFOS	265582	243736			91.8	50 - 150
17 PFNA			1000.00	980.60	98.1	70 - 130
D 56 13C9_PFNA	1088142	1141082			104.9	50 - 150
30 9Cl-PF3ONS			932.00	919.97	98.7	70 - 130
D 55 13C8_PFOSA	522841	459573			87.9	50 - 150
19 PFOSA			1000.00	989.25	98.9	70 - 130
16 PFNS			960.00	929.89	96.9	70 - 130
10 PFDA			1000.00	957.29	95.7	70 - 130
3 8:2 FTS			958.00	903.99	94.4	70 - 130
D 51 13C6_PFDA	921365	952303			103.4	50 - 150
D 65 13C2_8:2 FTS_2	254101	298157			117.3	50 - 150
D 58 d3-MeFOSAA	1348016	1478159			109.7	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	985.82	98.6	70 - 130
D 61 d7-MeFOSE	140684	136654			97.1	50 - 150
9 PFDS			964.00	910.78	94.5	70 - 130
32 MeFOSE			1000.00	1010.26	101	70 - 130
25 PFUdA			1000.00	998.37	99.8	70 - 130
D 60 d5-EtFOSAA	1200935	1330069			110.8	50 - 150
26 MeFOSA			1000.00	1137.44	113.7	70 - 130
D 57 d3-MeFOSA	71225	70055			98.4	50 - 150
D 52 13C7_PFUdA	831314	825965			99.4	50 - 150
5 N-EtFOSAA			1000.00	985.74	98.6	70 - 130
31 11Cl-PF3OUDS			942.00	850.00	90.2	70 - 130
D 62 d9-EtFOSE	130028	132553			101.9	50 - 150
33 EtFOSE			1000.00	960.72	96.1	70 - 130
D 59 d5-EtFOSA	64923	70679			108.9	50 - 150
27 EtFOSA			1000.00	871.14	87.1	70 - 130
11 PFDoA			1000.00	928.17	92.8	70 - 130
D 38 13C2_PFDoA	893930	985456			110.2	50 - 150
4 10:2 FTS			964.00	994.65	103.2	70 - 130
34 PFDOS			968.00	913.06	94.3	70 - 130
24 PFTrDA			1000.00	947.44	94.7	70 - 130
D 42 13C2_PFTeDA	956542	1010232			105.6	50 - 150
23 PFTeDA			1000.00	1041.57	104.2	70 - 130
35 PFHxDA			1000.00	929.85	93	70 - 130
D 40 13C2_PFHxDA	554043	576946			104.1	50 - 150
36 PFODA			1000.00	920.10	92	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LIMS\LCMSMS01.i\091521-DOD+ICAL.b\091521049.d
Injection Date: 15-Sep-2021 20:28:26 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 33
Sample Info: CCV 1000A_SVLC-1643 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1193454	1153418			96.6	50 - 150
8 PFBA			1000.00	1010.45	101	70 - 130
21 PFPeA			1000.00	935.88	93.6	70 - 130
D 50 13C5_PFPeA	1164243	1177792			101.2	50 - 150
D 44 13C3_PFBS	375554	372235			99.1	50 - 150
7 PFBS			884.00	877.91	99.3	70 - 130
D 63 13C2_4:2 FTS_2	327798	336762			102.7	50 - 150
1 4:2 FTS			934.00	970.59	103.9	70 - 130
D 49 13C5_PFHxA	1062655	1026154			96.6	50 - 150
15 PFHxA			1000.00	1056.46	105.6	70 - 130
22 PFPeS			938.00	927.80	98.9	70 - 130
28 GenX			2000.00	1911.50	95.6	70 - 130
D 66 13C3_GenX	838617	808089			96.4	50 - 150
D 47 13C4_PFHpA	1056209	1081962			102.4	50 - 150
13 PFHpA			1000.00	998.61	99.9	70 - 130
D 45 13C3_PFHxS	308635	287466			93.1	50 - 150
14 PFHxS			910.00	869.36	95.5	70 - 130
29 ADONA			942.00	845.55	89.8	70 - 130
2 6:2 FTS			948.00	943.13	99.5	70 - 130
D 64 13C2_6:2 FTS_2	361571	399653			110.5	50 - 150
D 53 13C8_PFOA	1095338	1118141			102.1	50 - 150
20 PFOA			1000.00	961.57	96.2	70 - 130
12 PFHpS			952.00	957.37	100.6	70 - 130
18 PFOS			928.00	891.82	96.1	70 - 130
D 54 13C8_PFOS	265582	243540			91.7	50 - 150
17 PFNA			1000.00	1015.34	101.5	70 - 130
D 56 13C9_PFNA	1088142	1074274			98.7	50 - 150
30 9Cl-PF3ONS			932.00	835.20	89.6	70 - 130
D 55 13C8_PFOSA	522841	469513			89.8	50 - 150
19 PFOSA			1000.00	991.28	99.1	70 - 130
16 PFNS			960.00	962.86	100.3	70 - 130
10 PFDA			1000.00	1019.88	102	70 - 130
3 8:2 FTS			958.00	1028.47	107.4	70 - 130
D 51 13C6_PFDA	921365	941532			102.2	50 - 150
D 65 13C2_8:2 FTS_2	254101	237838			93.6	50 - 150
D 58 d3-MeFOSAA	1348016	1398909			103.8	50 - 150

Report Date: 17-Sep-2021 11:28:13 AIM Revision: 2.0.2021.0812
Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521049.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	997.77	99.8	70 - 130
D 61 d7-MeFOSE	140684	141696			100.7	50 - 150
9 PFDS			964.00	924.40	95.9	70 - 130
32 MeFOSE			1000.00	913.06	91.3	70 - 130
25 PFUdA			1000.00	1097.81	109.8	70 - 130
D 60 d5-EtFOSAA	1200935	1206143			100.4	50 - 150
26 MeFOSA			1000.00	1006.52	100.7	70 - 130
D 57 d3-MeFOSA	71225	67073			94.2	50 - 150
D 52 13C7_PFUdA	831314	846477			101.8	50 - 150
5 N-EtFOSAA			1000.00	957.22	95.7	70 - 130
31 11Cl-PF3OUDS			942.00	885.35	94	70 - 130
D 62 d9-EtFOSE	130028	132210			101.7	50 - 150
33 EtFOSE			1000.00	1013.76	101.4	70 - 130
D 59 d5-EtFOSA	64923	68398			105.4	50 - 150
27 EtFOSA			1000.00	906.72	90.7	70 - 130
11 PFDoA			1000.00	1004.82	100.5	70 - 130
D 38 13C2_PFDoA	893930	871679			97.5	50 - 150
4 10:2 FTS			964.00	955.53	99.1	70 - 130
34 PFDOS			968.00	929.37	96	70 - 130
24 PFTrDA			1000.00	973.35	97.3	70 - 130
D 42 13C2_PFTeDA	956542	947012			99	50 - 150
23 PFTeDA			1000.00	996.08	99.6	70 - 130
35 PFHxDA			1000.00	967.63	96.8	70 - 130
D 40 13C2_PFHxDA	554043	534269			96.4	50 - 150
36 PFODA			1000.00	1006.09	100.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521063.d
Injection Date: 15-Sep-2021 22:56:59 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 46
Sample Info: CCV 1000B_SVLC-1643 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1193454	1221607			102.4	50 - 150
8 PFBA			1000.00	972.51	97.3	70 - 130
21 PFPeA			1000.00	971.88	97.2	70 - 130
D 50 13C5_PFPeA	1164243	1211887			104.1	50 - 150
D 44 13C3_PFBS	375554	385408			102.6	50 - 150
7 PFBS			884.00	933.18	105.6	70 - 130
D 63 13C2_4:2 FTS_2	327798	320740			97.8	50 - 150
1 4:2 FTS			934.00	1050.75	112.5	70 - 130
D 49 13C5_PFHxA	1062655	1021235			96.1	50 - 150
15 PFHxA			1000.00	1009.96	101	70 - 130
22 PFPeS			938.00	953.78	101.7	70 - 130
28 GenX			2000.00	1938.66	96.9	70 - 130
D 66 13C3_GenX	838617	859152			102.4	50 - 150
D 47 13C4_PFHpA	1056209	989583			93.7	50 - 150
13 PFHpA			1000.00	1135.68	113.6	70 - 130
D 45 13C3_PFHxS	308635	303921			98.5	50 - 150
14 PFHxS			910.00	921.70	101.3	70 - 130
29 ADONA			942.00	856.32	90.9	70 - 130
2 6:2 FTS			948.00	781.67	82.5	70 - 130
D 64 13C2_6:2 FTS_2	361571	541346			149.7	50 - 150
D 53 13C8_PFOA	1095338	1178260			107.6	50 - 150
20 PFOA			1000.00	954.77	95.5	70 - 130
12 PFHpS			952.00	902.09	94.8	70 - 130
18 PFOS			928.00	886.60	95.5	70 - 130
D 54 13C8_PFOS	265582	240071			90.4	50 - 150
17 PFNA			1000.00	955.12	95.5	70 - 130
D 56 13C9_PFNA	1088142	1108299			101.9	50 - 150
30 9Cl-PF3ONS			932.00	903.23	96.9	70 - 130
D 55 13C8_PFOSA	522841	502606			96.1	50 - 150
19 PFOSA			1000.00	946.64	94.7	70 - 130
16 PFNS			960.00	914.66	95.3	70 - 130
10 PFDA			1000.00	1038.72	103.9	70 - 130
3 8:2 FTS			958.00	1031.30	107.7	70 - 130
D 51 13C6_PFDA	921365	920771			99.9	50 - 150
D 65 13C2_8:2 FTS_2	254101	235441			92.7	50 - 150
D 58 d3-MeFOSAA	1348016	1457088			108.1	50 - 150

Report Date: 17-Sep-2021 11:28:29 AIM Revision: 2.0.2021.0812
Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521063.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	947.13	94.7	70 - 130
D 61 d7-MeFOSE	140684	139264			99	50 - 150
9 PFDS			964.00	985.29	102.2	70 - 130
32 MeFOSE			1000.00	952.63	95.3	70 - 130
25 PFUdA			1000.00	974.59	97.5	70 - 130
D 60 d5-EtFOSAA	1200935	1238868			103.2	50 - 150
26 MeFOSA			1000.00	1013.10	101.3	70 - 130
D 57 d3-MeFOSA	71225	74055			104	50 - 150
D 52 13C7_PFUdA	831314	863459			103.9	50 - 150
5 N-EtFOSAA			1000.00	978.57	97.9	70 - 130
31 11Cl-PF3OUDS			942.00	941.25	99.9	70 - 130
D 62 d9-EtFOSE	130028	134087			103.1	50 - 150
33 EtFOSE			1000.00	911.34	91.1	70 - 130
D 59 d5-EtFOSA	64923	63712			98.1	50 - 150
27 EtFOSA			1000.00	982.06	98.2	70 - 130
11 PFDoA			1000.00	1062.20	106.2	70 - 130
D 38 13C2_PFDoA	893930	820215			91.8	50 - 150
4 10:2 FTS			964.00	914.39	94.9	70 - 130
34 PFDOS			968.00	940.81	97.2	70 - 130
24 PFTrDA			1000.00	1038.85	103.9	70 - 130
D 42 13C2_PFTeDA	956542	943367			98.6	50 - 150
23 PFTeDA			1000.00	991.88	99.2	70 - 130
35 PFHxDA			1000.00	942.72	94.3	70 - 130
D 40 13C2_PFHxDA	554043	530637			95.8	50 - 150
36 PFODA			1000.00	978.15	97.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521072.d
Injection Date: 16-Sep-2021 00:32:31 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 54
Sample Info: CCV 1000C_SVLC-1643 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1193454	1192661			99.9	50 - 150
8 PFBA			1000.00	1002.22	100.2	70 - 130
21 PFPeA			1000.00	934.98	93.5	70 - 130
D 50 13C5_PFPeA	1164243	1162503			99.9	50 - 150
D 44 13C3_PFBS	375554	374865			99.8	50 - 150
7 PFBS			884.00	863.23	97.7	70 - 130
D 63 13C2_4:2 FTS_2	327798	331801			101.2	50 - 150
1 4:2 FTS			934.00	956.86	102.4	70 - 130
D 49 13C5_PFHxA	1062655	1066953			100.4	50 - 150
15 PFHxA			1000.00	940.36	94	70 - 130
22 PFPeS			938.00	913.93	97.4	70 - 130
28 GenX			2000.00	1965.85	98.3	70 - 130
D 66 13C3_GenX	838617	859682			102.5	50 - 150
D 47 13C4_PFHpA	1056209	1056441			100	50 - 150
13 PFHpA			1000.00	1027.65	102.8	70 - 130
D 45 13C3_PFHxS	308635	294242			95.3	50 - 150
14 PFHxS			910.00	868.71	95.5	70 - 130
29 ADONA			942.00	890.10	94.5	70 - 130
2 6:2 FTS			948.00	886.02	93.5	70 - 130
D 64 13C2_6:2 FTS_2	361571	398350			110.2	50 - 150
D 53 13C8_PFOA	1095338	1085806			99.1	50 - 150
20 PFOA			1000.00	1142.56	114.3	70 - 130
12 PFHpS			952.00	934.30	98.1	70 - 130
18 PFOS			928.00	925.88	99.8	70 - 130
D 54 13C8_PFOS	265582	227539			85.7	50 - 150
17 PFNA			1000.00	909.62	91	70 - 130
D 56 13C9_PFNA	1088142	1189598			109.3	50 - 150
30 9Cl-PF3ONS			932.00	967.99	103.9	70 - 130
D 55 13C8_PFOSA	522841	453312			86.7	50 - 150
19 PFOSA			1000.00	1007.37	100.7	70 - 130
16 PFNS			960.00	1096.36	114.2	70 - 130
10 PFDA			1000.00	945.46	94.5	70 - 130
3 8:2 FTS			958.00	918.51	95.9	70 - 130
D 51 13C6_PFDA	921365	969348			105.2	50 - 150
D 65 13C2_8:2 FTS_2	254101	257825			101.5	50 - 150
D 58 d3-MeFOSAA	1348016	1472933			109.3	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	877.01	87.7	70 - 130
D 61 d7-MeFOSE	140684	133838			95.1	50 - 150
9 PFDS			964.00	980.49	101.7	70 - 130
32 MeFOSE			1000.00	971.46	97.1	70 - 130
25 PFUdA			1000.00	1077.76	107.8	70 - 130
D 60 d5-EtFOSAA	1200935	1190911			99.2	50 - 150
26 MeFOSA			1000.00	1002.01	100.2	70 - 130
D 57 d3-MeFOSA	71225	67119			94.2	50 - 150
D 52 13C7_PFUdA	831314	827057			99.5	50 - 150
5 N-EtFOSAA			1000.00	986.81	98.7	70 - 130
31 11Cl-PF3OUDS			942.00	1023.09	108.6	70 - 130
D 62 d9-EtFOSE	130028	134557			103.5	50 - 150
33 EtFOSE			1000.00	955.32	95.5	70 - 130
D 59 d5-EtFOSA	64923	65365			100.7	50 - 150
27 EtFOSA			1000.00	915.09	91.5	70 - 130
11 PFDoA			1000.00	984.78	98.5	70 - 130
D 38 13C2_PFDoA	893930	890895			99.7	50 - 150
4 10:2 FTS			964.00	871.58	90.4	70 - 130
34 PFDOS			968.00	991.65	102.4	70 - 130
24 PFTrDA			1000.00	908.68	90.9	70 - 130
D 42 13C2_PFTeDA	956542	953460			99.7	50 - 150
23 PFTeDA			1000.00	988.62	98.9	70 - 130
35 PFHxDA			1000.00	940.37	94	70 - 130
D 40 13C2_PFHxDA	554043	522162			94.2	50 - 150
36 PFODA			1000.00	980.19	98	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521082.d
Injection Date: 16-Sep-2021 02:18:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 63
Sample Info: CCV 1000D_SVLC-1643 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1193454	1144225			95.9	50 - 150
8 PFBA			1000.00	1024.05	102.4	70 - 130
21 PFPeA			1000.00	1005.81	100.6	70 - 130
D 50 13C5_PFPeA	1164243	1124478			96.6	50 - 150
D 44 13C3_PFBS	375554	387096			103.1	50 - 150
7 PFBS			884.00	855.26	96.7	70 - 130
D 63 13C2_4:2 FTS_2	327798	332252			101.4	50 - 150
1 4:2 FTS			934.00	885.84	94.8	70 - 130
D 49 13C5_PFHxA	1062655	1002279			94.3	50 - 150
15 PFHxA			1000.00	931.96	93.2	70 - 130
22 PFPeS			938.00	859.95	91.7	70 - 130
28 GenX			2000.00	2328.49	116.4	70 - 130
D 66 13C3_GenX	838617	758485			90.4	50 - 150
D 47 13C4_PFHpA	1056209	1054725			99.9	50 - 150
13 PFHpA			1000.00	911.97	91.2	70 - 130
D 45 13C3_PFHxS	308635	304229			98.6	50 - 150
14 PFHxS			910.00	774.34	85.1	70 - 130
29 ADONA			942.00	802.05	85.1	70 - 130
2 6:2 FTS			948.00	936.82	98.8	70 - 130
D 64 13C2_6:2 FTS_2	361571	385122			106.5	50 - 150
D 53 13C8_PFOA	1095338	1109917			101.3	50 - 150
20 PFOA			1000.00	950.46	95	70 - 130
12 PFHpS			952.00	899.26	94.5	70 - 130
18 PFOS			928.00	1022.72	110.2	70 - 130
D 54 13C8_PFOS	265582	219013			82.5	50 - 150
17 PFNA			1000.00	1187.10	118.7	70 - 130
D 56 13C9_PFNA	1088142	904634			83.1	50 - 150
30 9Cl-PF3ONS			932.00	1015.21	108.9	70 - 130
D 55 13C8_PFOSA	522841	465177			89	50 - 150
19 PFOSA			1000.00	1008.48	100.8	70 - 130
16 PFNS			960.00	1024.08	106.7	70 - 130
10 PFDA			1000.00	936.53	93.7	70 - 130
3 8:2 FTS			958.00	1046.89	109.3	70 - 130
D 51 13C6_PFDA	921365	945712			102.6	50 - 150
D 65 13C2_8:2 FTS_2	254101	250168			98.5	50 - 150
D 58 d3-MeFOSAA	1348016	1410258			104.6	50 - 150

Report Date: 17-Sep-2021 11:27:40 AIM Revision: 2.0.2021.0812
Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521082.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	906.03	90.6	70 - 130
D 61 d7-MeFOSE	140684	127384			90.5	50 - 150
9 PFDS			964.00	1092.51	113.3	70 - 130
32 MeFOSE			1000.00	930.81	93.1	70 - 130
25 PFUdA			1000.00	1031.35	103.1	70 - 130
D 60 d5-EtFOSAA	1200935	1249186			104	50 - 150
26 MeFOSA			1000.00	979.85	98	70 - 130
D 57 d3-MeFOSA	71225	67333			94.5	50 - 150
D 52 13C7_PFUdA	831314	807926			97.2	50 - 150
5 N-EtFOSAA			1000.00	908.01	90.8	70 - 130
31 11Cl-PF3OUDS			942.00	957.95	101.7	70 - 130
D 62 d9-EtFOSE	130028	121385			93.4	50 - 150
33 EtFOSE			1000.00	1012.23	101.2	70 - 130
D 59 d5-EtFOSA	64923	63378			97.6	50 - 150
27 EtFOSA			1000.00	1012.75	101.3	70 - 130
11 PFDoA			1000.00	1055.27	105.5	70 - 130
D 38 13C2_PFDoA	893930	864979			96.8	50 - 150
4 10:2 FTS			964.00	833.31	86.4	70 - 130
34 PFDOS			968.00	1040.08	107.4	70 - 130
24 PFTrDA			1000.00	978.00	97.8	70 - 130
D 42 13C2_PFTeDA	956542	932217			97.5	50 - 150
23 PFTeDA			1000.00	969.11	96.9	70 - 130
35 PFHxDA			1000.00	991.10	99.1	70 - 130
D 40 13C2_PFHxDA	554043	479952			86.6	50 - 150
36 PFODA			1000.00	1027.84	102.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\091921-DOD.b\091921005.d
Injection Date: 19-Sep-2021 16:29:12 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: ID CCV 100_SVLC-1656 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	96.074	96.1	70 - 130
D 46 13C4_PFBA	701901	714609			101.8	50 - 150
D 50 13C5_PFPeA	675625	663276			98.2	50 - 150
21 PFPeA			100.00	93.261	93.3	70 - 130
D 44 13C3_PFBS	215935	209199			96.9	50 - 150
7 PFBS			88.400	86.563	97.9	70 - 130
D 63 13C2_4:2 FTS_2	113488	122950			108.3	50 - 150
1 4:2 FTS			93.400	99.045	106	70 - 130
D 49 13C5_PFHxA	781501	722926			92.5	50 - 150
15 PFHxA			100.00	102.96	103	70 - 130
22 PFPeS			93.800	89.978	95.9	70 - 130
D 66 13C3_GenX	1356476	1251462			92.3	50 - 150
28 GenX			200.00	203.30	101.6	70 - 130
13 PFHpA			100.00	95.073	95.1	70 - 130
D 47 13C4_PFHpA	612258	627704			102.5	50 - 150
D 45 13C3_PFHxS	155449	146212			94.1	50 - 150
14 PFHxS			91.000	81.369	89.4	70 - 130
29 ADONA			94.200	88.893	94.4	70 - 130
2 6:2 FTS			94.800	29.828	31.5	70 - 130
D 64 13C2_6:2 FTS_2	121867	101702			83.5	50 - 150
20 PFOA			100.00	86.120	86.1	70 - 130
D 53 13C8_PFOA	638893	601306			94.1	50 - 150
12 PFHpS			95.200	95.174	100	70 - 130
D 54 13C8_PFOS	153883	145556			94.6	50 - 150
18 PFOS			92.800	91.050	98.1	70 - 130
D 56 13C9_PFNA	733051	718315			98	50 - 150
17 PFNA			100.00	98.023	98	70 - 130
30 9Cl-PF3ONS			93.200	86.177	92.5	70 - 130
19 PFOSA			100.00	91.769	91.8	70 - 130
D 55 13C8_PFOSA	307704	293257			95.3	50 - 150
16 PFNS			96.000	91.973	95.8	70 - 130
3 8:2 FTS			95.800	115.71	120.8	70 - 130
D 51 13C6_PFDA	760550	725288			95.4	50 - 150
D 65 13C2_8:2 FTS_2	120707	122847			101.8	50 - 150
10 PFDA			100.00	87.630	87.6	70 - 130
6 N-MeFOSAA			100.00	106.42	106.4	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	819099	769495			93.9	50 - 150
D 61 d7-MeFOSE	93575	90817			97.1	50 - 150
9 PFDS			96.400	84.638	87.8	70 - 130
32 MeFOSE			100.00	106.57	106.6	70 - 130
26 MeFOSA			100.00	104.45	104.5	70 - 130
25 PFUdA			100.00	119.51	119.5	70 - 130
D 60 d5-EtFOSAA	746635	670500			89.8	50 - 150
D 52 13C7_PFUdA	776873	682968			87.9	50 - 150
D 57 d3-MeFOSA	53750	51183			95.2	50 - 150
5 N-EtFOSAA			100.00	79.281	79.3	70 - 130
D 62 d9-EtFOSE	113265	108291			95.6	50 - 150
31 11Cl-PF3OUDS			94.200	84.486	89.7	70 - 130
33 EtFOSE			100.00	90.776	90.8	70 - 130
D 59 d5-EtFOSA	52395	40667			77.6	50 - 150
27 EtFOSA			100.00	146.44	146.4	70 - 130
D 38 13C2_PFDoA	860250	794951			92.4	50 - 150
11 PFDoA			100.00	94.528	94.5	70 - 130
4 10:2 FTS			96.400	97.730	101.4	70 - 130
34 PFDOS			96.800	89.223	92.2	70 - 130
24 PFTrDA			100.00	89.550	89.6	70 - 130
23 PFTeDA			100.00	101.81	101.8	70 - 130
D 42 13C2_PFTeDA	1086817	1037362			95.4	50 - 150
35 PFHxDA			100.00	105.23	105.2	70 - 130
D 40 13C2_PFHxDA	1110985	982408			88.4	50 - 150
36 PFODA			100.00	101.00	101	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\091921-DOD.b\091921006.d
Injection Date: 19-Sep-2021 16:39:46 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: ID CCV 200_SVLC-1641 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	199.87	99.9	70 - 130
D 46 13C4_PFBA	714609	671697			94	50 - 150
D 50 13C5_PFPeA	663276	609625			91.9	50 - 150
21 PFPeA			200.00	205.69	102.8	70 - 130
D 44 13C3_PFBS	209199	190774			91.2	50 - 150
7 PFBS			176.80	193.60	109.5	70 - 130
D 63 13C2_4:2 FTS_2	122950	109645			89.2	50 - 150
1 4:2 FTS			186.80	217.71	116.5	70 - 130
D 49 13C5_PFHxA	722926	681100			94.2	50 - 150
15 PFHxA			200.00	213.41	106.7	70 - 130
22 PFPeS			187.60	190.85	101.7	70 - 130
D 66 13C3_GenX	1251462	1161263			92.8	50 - 150
28 GenX			400.00	396.25	99.1	70 - 130
13 PFHpA			200.00	216.91	108.5	70 - 130
D 47 13C4_PFHpA	627704	538321			85.8	50 - 150
D 45 13C3_PFHxS	146212	130150			89	50 - 150
14 PFHxS			182.00	188.88	103.8	70 - 130
29 ADONA			188.40	220.01	116.8	70 - 130
2 6:2 FTS			189.60	137.32	72.4	70 - 130
D 64 13C2_6:2 FTS_2	101702	94047			92.5	50 - 150
20 PFOA			200.00	206.11	103.1	70 - 130
D 53 13C8_PFOA	601306	570547			94.9	50 - 150
12 PFHpS			190.40	178.53	93.8	70 - 130
D 54 13C8_PFOS	145556	136488			93.8	50 - 150
18 PFOS			185.60	190.37	102.6	70 - 130
D 56 13C9_PFNA	718315	675547			94	50 - 150
17 PFNA			200.00	204.05	102	70 - 130
30 9Cl-PF3ONS			186.40	188.45	101.1	70 - 130
19 PFOSA			200.00	202.07	101	70 - 130
D 55 13C8_PFOSA	293257	267284			91.1	50 - 150
16 PFNS			192.00	181.85	94.7	70 - 130
3 8:2 FTS			191.60	176.87	92.3	70 - 130
D 51 13C6_PFDA	725288	646512			89.1	50 - 150
D 65 13C2_8:2 FTS_2	122847	116384			94.7	50 - 150
10 PFDA			200.00	209.43	104.7	70 - 130
6 N-MeFOSAA			200.00	189.14	94.6	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	769495	723553			94	50 - 150
D 61 d7-MeFOSE	90817	89308			98.3	50 - 150
9 PFDS			192.80	170.29	88.3	70 - 130
32 MeFOSE			200.00	197.09	98.5	70 - 130
26 MeFOSA			200.00	201.32	100.7	70 - 130
25 PFUdA			200.00	199.93	100	70 - 130
D 60 d5-EtFOSAA	670500	621265			92.7	50 - 150
D 52 13C7_PFUdA	682968	694834			101.7	50 - 150
D 57 d3-MeFOSA	51183	49033			95.8	50 - 150
5 N-EtFOSAA			200.00	213.75	106.9	70 - 130
D 62 d9-EtFOSE	108291	102275			94.4	50 - 150
31 11Cl-PF3OUDS			188.40	192.64	102.3	70 - 130
33 EtFOSE			200.00	208.76	104.4	70 - 130
D 59 d5-EtFOSA	40667	39827			97.9	50 - 150
27 EtFOSA			200.00	224.77	112.4	70 - 130
D 38 13C2_PFDoA	794951	690928			86.9	50 - 150
11 PFDoA			200.00	205.63	102.8	70 - 130
4 10:2 FTS			192.80	152.80	79.3	70 - 130
34 PFDOS			193.60	163.52	84.5	70 - 130
24 PFTrDA			200.00	202.85	101.4	70 - 130
23 PFTeDA			200.00	208.95	104.5	70 - 130
D 42 13C2_PFTeDA	1037362	967999			93.3	50 - 150
35 PFHxDA			200.00	216.93	108.5	70 - 130
D 40 13C2_PFHxDA	982408	909163			92.5	50 - 150
36 PFODA			200.00	202.41	101.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\091921-DOD.b\091921022.d
Injection Date: 19-Sep-2021 19:29:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 15
Sample Info: ID CCV 1000_SVLC-1638 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	979.43	97.9	70 - 130
D 46 13C4_PFBA	714609	669801			93.7	50 - 150
D 50 13C5_PFPeA	663276	619281			93.4	50 - 150
21 PFPeA			1000.00	971.11	97.1	70 - 130
D 44 13C3_PFBS	209199	199952			95.6	50 - 150
7 PFBS			884.00	870.31	98.5	70 - 130
D 63 13C2_4:2 FTS_2	122950	127064			103.3	50 - 150
1 4:2 FTS			934.00	859.58	92	70 - 130
D 49 13C5_PFHxA	722926	709398			98.1	50 - 150
15 PFHxA			1000.00	992.51	99.3	70 - 130
22 PFPeS			938.00	883.79	94.2	70 - 130
D 66 13C3_GenX	1251462	1122880			89.7	50 - 150
28 GenX			2000.00	1993.88	99.7	70 - 130
13 PFHpA			1000.00	985.93	98.6	70 - 130
D 47 13C4_PFHpA	627704	571213			91	50 - 150
D 45 13C3_PFHxS	146212	143615			98.2	50 - 150
14 PFHxS			910.00	920.60	101.2	70 - 130
29 ADONA			942.00	912.05	96.8	70 - 130
2 6:2 FTS			948.00	985.35	103.9	70 - 130
D 64 13C2_6:2 FTS_2	101702	97993			96.4	50 - 150
20 PFOA			1000.00	971.16	97.1	70 - 130
D 53 13C8_PFOA	601306	569550			94.7	50 - 150
12 PFHpS			952.00	870.94	91.5	70 - 130
D 54 13C8_PFOS	145556	147416			101.3	50 - 150
18 PFOS			928.00	788.60	85	70 - 130
D 56 13C9_PFNA	718315	668673			93.1	50 - 150
17 PFNA			1000.00	1005.77	100.6	70 - 130
30 9Cl-PF3ONS			932.00	876.74	94.1	70 - 130
19 PFOSA			1000.00	936.05	93.6	70 - 130
D 55 13C8_PFOSA	293257	289577			98.7	50 - 150
16 PFNS			960.00	802.20	83.6	70 - 130
3 8:2 FTS			958.00	899.56	93.9	70 - 130
D 51 13C6_PFDA	725288	664883			91.7	50 - 150
D 65 13C2_8:2 FTS_2	122847	116808			95.1	50 - 150
10 PFDA			1000.00	1012.82	101.3	70 - 130
6 N-MeFOSAA			1000.00	944.91	94.5	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	769495	764672			99.4	50 - 150
D 61 d7-MeFOSE	90817	98894			108.9	50 - 150
9 PFDS			964.00	888.75	92.2	70 - 130
32 MeFOSE			1000.00	940.71	94.1	70 - 130
26 MeFOSA			1000.00	927.24	92.7	70 - 130
25 PFUdA			1000.00	1027.10	102.7	70 - 130
D 60 d5-EtFOSAA	670500	715418			106.7	50 - 150
D 52 13C7_PFUdA	682968	678595			99.4	50 - 150
D 57 d3-MeFOSA	51183	49023			95.8	50 - 150
5 N-EtFOSAA			1000.00	896.65	89.7	70 - 130
D 62 d9-EtFOSE	108291	102918			95	50 - 150
31 11Cl-PF3OUDS			942.00	827.07	87.8	70 - 130
33 EtFOSE			1000.00	1099.40	109.9	70 - 130
D 59 d5-EtFOSA	40667	48698			119.7	50 - 150
27 EtFOSA			1000.00	912.24	91.2	70 - 130
D 38 13C2_PFDoA	794951	709467			89.2	50 - 150
11 PFDoA			1000.00	1007.76	100.8	70 - 130
4 10:2 FTS			964.00	786.54	81.6	70 - 130
34 PFDOS			968.00	784.29	81	70 - 130
24 PFTrDA			1000.00	1023.05	102.3	70 - 130
23 PFTeDA			1000.00	988.55	98.9	70 - 130
D 42 13C2_PFTeDA	1037362	1007462			97.1	50 - 150
35 PFHxDA			1000.00	964.63	96.5	70 - 130
D 40 13C2_PFHxDA	982408	952870			97	50 - 150
36 PFODA			1000.00	953.79	95.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\091921-DOD.b\091921034.d
Injection Date: 19-Sep-2021 21:37:11 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 26
Sample Info: ID CCV 1000A_SVLC-1638 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	978.56	97.9	70 - 130
D 46 13C4_PFBA	714609	815238			114.1	50 - 150
D 50 13C5_PFPeA	663276	748849			112.9	50 - 150
21 PFPeA			1000.00	997.65	99.8	70 - 130
D 44 13C3_PFBS	209199	234831			112.3	50 - 150
7 PFBS			884.00	881.68	99.7	70 - 130
D 63 13C2_4:2 FTS_2	122950	142496			115.9	50 - 150
1 4:2 FTS			934.00	907.13	97.1	70 - 130
D 49 13C5_PFHxA	722926	848070			117.3	50 - 150
15 PFHxA			1000.00	963.81	96.4	70 - 130
22 PFPeS			938.00	953.15	101.6	70 - 130
D 66 13C3_GenX	1251462	1373506			109.8	50 - 150
28 GenX			2000.00	1956.14	97.8	70 - 130
13 PFHpA			1000.00	972.43	97.2	70 - 130
D 47 13C4_PFHpA	627704	696189			110.9	50 - 150
D 45 13C3_PFHxS	146212	174280			119.2	50 - 150
14 PFHxS			910.00	881.31	96.8	70 - 130
29 ADONA			942.00	901.79	95.7	70 - 130
2 6:2 FTS			948.00	872.64	92.1	70 - 130
D 64 13C2_6:2 FTS_2	101702	117365			115.4	50 - 150
20 PFOA			1000.00	912.54	91.3	70 - 130
D 53 13C8_PFOA	601306	719163			119.6	50 - 150
12 PFHpS			952.00	917.79	96.4	70 - 130
D 54 13C8_PFOS	145556	177450			121.9	50 - 150
18 PFOS			928.00	799.05	86.1	70 - 130
D 56 13C9_PFNA	718315	806221			112.2	50 - 150
17 PFNA			1000.00	995.31	99.5	70 - 130
30 9Cl-PF3ONS			932.00	834.75	89.6	70 - 130
19 PFOSA			1000.00	953.12	95.3	70 - 130
D 55 13C8_PFOSA	293257	355497			121.2	50 - 150
16 PFNS			960.00	828.02	86.3	70 - 130
3 8:2 FTS			958.00	947.80	98.9	70 - 130
D 51 13C6_PFDA	725288	833524			114.9	50 - 150
D 65 13C2_8:2 FTS_2	122847	147158			119.8	50 - 150
10 PFDA			1000.00	1010.48	101	70 - 130
6 N-MeFOSAA			1000.00	939.78	94	70 - 130

Report Date: 20-Sep-2021 10:29:34 AIM Revision: 2.0.2021.0812
Data File: \\Organics\LL\LCMSMS02.i\091921-DOD.b\091921034.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	769495	939105			122	50 - 150
D 61 d7-MeFOSE	90817	111190			122.4	50 - 150
9 PFDS			964.00	850.91	88.3	70 - 130
32 MeFOSE			1000.00	988.44	98.8	70 - 130
26 MeFOSA			1000.00	947.12	94.7	70 - 130
25 PFUdA			1000.00	935.52	93.6	70 - 130
D 60 d5-EtFOSAA	670500	796177			118.7	50 - 150
D 52 13C7_PFUdA	682968	873776			127.9	50 - 150
D 57 d3-MeFOSA	51183	60024			117.3	50 - 150
5 N-EtFOSAA			1000.00	1002.25	100.2	70 - 130
D 62 d9-EtFOSE	108291	135599			125.2	50 - 150
31 11Cl-PF3OUDS			942.00	863.35	91.7	70 - 130
33 EtFOSE			1000.00	976.81	97.7	70 - 130
D 59 d5-EtFOSA	40667	54121			133.1	50 - 150
27 EtFOSA			1000.00	940.71	94.1	70 - 130
D 38 13C2_PFDoA	794951	840653			105.7	50 - 150
11 PFDoA			1000.00	997.28	99.7	70 - 130
4 10:2 FTS			964.00	710.61	73.7	70 - 130
34 PFDOS			968.00	773.25	79.9	70 - 130
24 PFTrDA			1000.00	1012.60	101.3	70 - 130
23 PFTeDA			1000.00	979.90	98	70 - 130
D 42 13C2_PFTeDA	1037362	1226442			118.2	50 - 150
35 PFHxDA			1000.00	972.21	97.2	70 - 130
D 40 13C2_PFHxDA	982408	1219614			124.1	50 - 150
36 PFODA			1000.00	912.79	91.3	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS02.i\091921-DOD.b\091921040.d
Injection Date: 19-Sep-2021 22:41:02 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 31
Sample Info: ID CCV 1000B_SVLC-1638 Misc. Info:
Inst. ID: LCMSMS02.i Operator: Justin Gavin

Method: LCMSMS02_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	977.85	97.8	70 - 130
D 46 13C4_PFBA	714609	646544			90.5	50 - 150
D 50 13C5_PFPeA	663276	590744			89.1	50 - 150
21 PFPeA			1000.00	961.82	96.2	70 - 130
D 44 13C3_PFBS	209199	195798			93.6	50 - 150
7 PFBS			884.00	821.32	92.9	70 - 130
D 63 13C2_4:2 FTS_2	122950	116075			94.4	50 - 150
1 4:2 FTS			934.00	836.72	89.6	70 - 130
D 49 13C5_PFHxA	722926	692598			95.8	50 - 150
15 PFHxA			1000.00	953.83	95.4	70 - 130
22 PFPeS			938.00	868.15	92.6	70 - 130
D 66 13C3_GenX	1251462	1106610			88.4	50 - 150
28 GenX			2000.00	1961.81	98.1	70 - 130
13 PFHpA			1000.00	1015.09	101.5	70 - 130
D 47 13C4_PFHpA	627704	544743			86.8	50 - 150
D 45 13C3_PFHxS	146212	144341			98.7	50 - 150
14 PFHxS			910.00	847.72	93.2	70 - 130
29 ADONA			942.00	877.19	93.1	70 - 130
2 6:2 FTS			948.00	936.55	98.8	70 - 130
D 64 13C2_6:2 FTS_2	101702	97561			95.9	50 - 150
20 PFOA			1000.00	992.72	99.3	70 - 130
D 53 13C8_PFOA	601306	550328			91.5	50 - 150
12 PFHpS			952.00	855.08	89.8	70 - 130
D 54 13C8_PFOS	145556	136715			93.9	50 - 150
18 PFOS			928.00	848.91	91.5	70 - 130
D 56 13C9_PFNA	718315	639374			89	50 - 150
17 PFNA			1000.00	981.23	98.1	70 - 130
30 9Cl-PF3ONS			932.00	892.08	95.7	70 - 130
19 PFOSA			1000.00	1004.13	100.4	70 - 130
D 55 13C8_PFOSA	293257	267649			91.3	50 - 150
16 PFNS			960.00	854.14	89	70 - 130
3 8:2 FTS			958.00	885.42	92.4	70 - 130
D 51 13C6_PFDA	725288	663944			91.5	50 - 150
D 65 13C2_8:2 FTS_2	122847	110114			89.6	50 - 150
10 PFDA			1000.00	937.88	93.8	70 - 130
6 N-MeFOSAA			1000.00	1009.83	101	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	769495	736544			95.7	50 - 150
D 61 d7-MeFOSE	90817	88282			97.2	50 - 150
9 PFDS			964.00	922.48	95.7	70 - 130
32 MeFOSE			1000.00	1036.94	103.7	70 - 130
26 MeFOSA			1000.00	974.25	97.4	70 - 130
25 PFUdA			1000.00	1040.90	104.1	70 - 130
D 60 d5-EtFOSAA	670500	666178			99.4	50 - 150
D 52 13C7_PFUdA	682968	659845			96.6	50 - 150
D 57 d3-MeFOSA	51183	47966			93.7	50 - 150
5 N-EtFOSAA			1000.00	936.67	93.7	70 - 130
D 62 d9-EtFOSE	108291	101063			93.3	50 - 150
31 11Cl-PF3OUDS			942.00	876.20	93	70 - 130
33 EtFOSE			1000.00	1080.47	108	70 - 130
D 59 d5-EtFOSA	40667	44115			108.5	50 - 150
27 EtFOSA			1000.00	856.69	85.7	70 - 130
D 38 13C2_PFDoA	794951	685111			86.2	50 - 150
11 PFDoA			1000.00	982.35	98.2	70 - 130
4 10:2 FTS			964.00	750.97	77.9	70 - 130
34 PFDOS			968.00	798.25	82.5	70 - 130
24 PFTrDA			1000.00	968.74	96.9	70 - 130
23 PFTeDA			1000.00	997.07	99.7	70 - 130
D 42 13C2_PFTeDA	1037362	955492			92.1	50 - 150
35 PFHxDA			1000.00	961.07	96.1	70 - 130
D 40 13C2_PFHxDA	982408	955339			97.2	50 - 150
36 PFODA			1000.00	922.12	92.2	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\organics\LL\LCMSMS01.i\091321-DOD-R.b\091321007.d		
Injection Date:	13-Sep-2021 13:29:12	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V17	16-Sep-2021 08:57:04
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.727	1.727	0	1158065	22	>100:1			1001.00	920.26	106.1	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.727		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.110	2.120	0	1115758	17	>100:1			1001.00	913.83	108.3	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.120		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.172	2.183	0	346473	17	>100:1			1001.00	885.37	102.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.172		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.545		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.459	2.467	0	300015	19	>100:1			5005.00	4118.15	102.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.467		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.511	2.511	1	924080	19	>100:1			1001.00	861.46	98.5	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.511		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.625	2.632	0	865325	22	>100:1			5005.00	5928.77	117.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.625		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.897	2.913	0	964266	20	>100:1			1001.00	877.00	101.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.905		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.913	2.920	0	278011	21	>100:1			1001.00	936.02	104.6	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.920		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.946		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.298		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.272	3.278	0	269332	23	>100:1			5005.00	4407.17	101.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.278		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.291	3.298	0	1099256	35	>100:1			1001.00	983.84	106.9	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.298		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.678	3.678	0	214433	25	>100:1			1001.00	871.66	95.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.678		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.881		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		4.023		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.339		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.498		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.858		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.678	3.684	0	1166788	24	>100:1			1001.00	1105.44	118.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.684		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.911	3.911	0	462661	21	>100:1			1001.00	969.69	102.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.911		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		4.033	4.043	0	869095	17	>100:1			1001.00	948.32	99.2	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													
513 > 469	51	4.023	4.043	-1/-1	3873	18	3.8:1	Target = 10.67		4.7135	4.7135		
513 > 169	51	4.033	4.043		282	10	1.9:1	13.73 (5.33-16.01)					
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		4.033	4.033	1	265288	23	>100:1			5005.00	5894.56	102.8	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		4.033		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.654		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.202	4.193	1	1415193	22	>100:1			5005.00	5408.78	110.1	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													
570 > 419	58	4.202	4.193	1/0	1286	39	8.9:1	Target = 1.46	1.42	5.5248	5.5248		
570 > 483	58	4.202	4.193		1318	74	2.9:1	0.97 (0.73-2.20)	1.37				
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.312	4.311	1	136918	17	>100:1			1001.00	976.19	102.7	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.321		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.349	4.358	0	799003	18	>100:1			1001.00	976.10	102.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.358		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.358	4.358	1	1162978	19	>100:1			5005.00	5107.60	100.1	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.366		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.330	4.339	0	63354	15	>100:1			1001.00	875.67	99.3	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.339		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.474	4.473	1	127910	21	>100:1			1001.00	928.65	87.6	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.481		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.498	4.498	1	64594	20	>100:1			1001.00	952.36	108.3	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.514		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.632	4.639	0	902340	21	>100:1			1001.00	1004.08	100.2	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.639		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.889		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.110	5.116	0	991092	25	>100:1			1001.00	949.80	104.8	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		5.116		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.555	5.562	0	560134	26	>100:1			1001.00	1087.24	106.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													U
813 > 769	40		5.562		ND								
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		6.017		ND								
*** 37 13C2_PFDA**													
515 > 470		4.033	4.043	0	948131	17	>100:1			200.00			
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.511	2.511	1	1023083	19	>100:1			200.00			
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.298	3.298	0	1334857	34	>100:1			200.00			
*** 43 13C3_PFBA**													
216 > 172		1.727	1.727	0	1343296	22	>100:1			200.00			
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.678	3.671	1	258506	23	>100:1			200.00			

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521029.d		
Injection Date:	15-Sep-2021 16:56:47	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	13
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS01.i	Operator:	Matthew M. Miller
Method:	LCMSMS01_PFAS-ID	Version: V17	16-Sep-2021 08:57:04
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.727	1.721	1	1126792	20	>100:1			1001.00	1007.24	94.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.702	1.727	-1/-2	2140	12	-5.842:1			1.6820	1.6820		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.110	2.110	1	1133981	15	>100:1			1001.00	1044.84	97.4	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.110		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.172	2.162	1	343176	15	>100:1			1001.00	970.21	91.4	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.162		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.528		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.459	2.459	1	270774	18	>100:1			5005.00	4406.96	82.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													
327 > 307	63	2.476	2.459	2/1	278	17	2.9:1	Target = 1.49		2.5577	2.5577		
327 > 81	63	2.493	2.459		4125	20	11:1	0.06 (0.74-2.24)					J
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.502	2.493	1	909492	19	>100:1			1001.00	926.62	85.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.493		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.625	2.625	1	803711	19	>100:1			5005.00	5222.06	95.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.625		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.890	2.890	1	992869	18	>100:1			1001.00	979.02	94	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.890		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.906	2.906	1	273834	18	>100:1			1001.00	1001.19	88.7	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.906		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.928		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.287		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.259	3.261	0	261850	22	>100:1			5005.00	4025.20	72.4	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													
427 > 407	64		3.254		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.285	3.280	1	1015581	22	>100:1			1001.00	988.81	92.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.280		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.666	3.662	1	202572	21	>100:1			1001.00	873.67	76.3	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.662		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													
531 > 351	54	3.871	3.865	1/0	986	18	5.6:1			1.4836	1.4836		
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													
549 > 80	54	3.863	4.004	-8/-9	444	20	2.5:1	Target = 3.18		2.3134	2.3134		
549 > 99	54	3.863	4.004		213	12	2.9:1	2.08 (1.59-4.77)					
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													
599 > 80	54	4.260	4.305	-2/-3	1020	13	3.5:1	Target = 3.04		5.0318	5.0318		
599 > 99	54	4.260	4.305		85	13	1.5:1	12.00 (1.52-4.56)					J
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													
631 > 451	54	4.476	4.470	1/0	1036	20	7.3:1			1.7801	1.7801		
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.821		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.666	3.669	0	1039803	20	>100:1			1001.00	1023.30	95.6	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.669		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.901	3.903	0	439541	18	>100:1			1001.00	963.38	84.1	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.910		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		4.023	4.014	1	832055	18	>100:1			1001.00	980.57	90.3	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		4.014		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		4.013	4.014	0	249506	18	>100:1			5005.00	5668.00	98.2	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		4.014		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.622		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.172	4.173	0	1353652	19	>100:1			5005.00	5278.83	100.4	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.181		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.313	4.305	1	129808	18	>100:1			1001.00	986.28	92.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.314		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.331	4.332	0	853175	17	>100:1			1001.00	1071.33	102.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.323		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.331	4.332	0	59530	16	>100:1			1001.00	878.53	83.6	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													
512 > 169	57		4.332		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.340	4.332	1	1226640	18	>100:1			5005.00	5611.36	102.1	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													
584 > 419	60	4.348	4.332	1/0	2681	36	7.3:1	Target = 1.64	1.29	10.388	10.388		
584 > 526	60	4.331	4.332		1936	35	6.8:1	1.38 (0.82-2.46)	2.91				
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.476	4.470	1	114031	20	>100:1			1001.00	908.50	87.7	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.484		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.498	4.492	1	63348	17	>100:1			1001.00	1037.02	97.6	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.499		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.613	4.606	1	891690	19	>100:1			1001.00	1082.76	99.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.606		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													
663 > 619	38	4.866	4.850	1/0	538	13	2.2:1	Target = 4.33		1.0372	1.0372		
663 > 169	38	4.866	4.850		281	16	16:1	1.91 (2.16-6.50)					J
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.091	5.085	1	908089	22	>100:1			1001.00	1008.77	94.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													
713 > 669	42	5.084	5.085	0/-1	2592	15	3.9:1	Target = 9.81		3.0015	3.0015		
713 > 169	42	5.098	5.085		191	14	3.9:1	13.57 (4.90-14.72)					
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.521	5.512	1	499398	18	>100:1			1001.00	982.25	90.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.521	5.512	1/0	7578	15	19:1	Target = 13.10		9.1542	9.1542		
813 > 269	40	5.541	5.512		620	15	10:1	12.22 (6.55-19.66)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.960		ND								
*** 37 13C2_PFDA**													
515 > 470		4.013	4.014	0	805438	16	>100:1			200.00			
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.502	2.493	1	987818	18	>100:1			200.00			
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.279	3.287	0	1042920	21	>100:1			200.00			
*** 43 13C3_PFBA**													
216 > 172		1.727	1.727	1	1100607	19	>100:1			200.00			
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.659	3.662	0	215264	23	>100:1			200.00			

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File:	\\Organics\LL\LCMSMS02.i\091921-DOD.b\091921007.d		
Injection Date:	19-Sep-2021 16:50:19	Injection Vol:	10.0 uL
Sample Type:	InstBlk	Auto Sampler:	97
Lab Sample ID:	ID IBLK A	Lab Prep. Batch:	
Sample Info:	ID IBLK A	Misc. Info:	
Inst. ID:	LCMSMS02.i	Operator:	Justin Gavin
Method:	LCMSMS02_PFAS-ID	Version: V17	16-Sep-2021 08:57:04
Calib Method:	PFAS-ID	Lock State:	Unlocked
Quant Method:	IsoDil	Integrator:	picker

Reagent:	Istds	Conc. Level:	Smp	Vol. Added:	0.0100 ml
Reagent:	Surrogates	Conc. Level:	Smp	Vol. Added:	0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.705	1.705	0	711947	22	>100:1			1001.00	1119.91	99.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.705		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.077	2.077	0	656757	16	>100:1			1001.00	1097.40	99	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.088		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.130	2.141	0	211354	15	>100:1			1001.00	1113.63	101	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.141		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.478		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.407	2.407	0	124934	19	>100:1			5005.00	5906.39	101.6	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.407		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.442	2.442	0	742062	19	>100:1			1001.00	1086.33	102.6	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.442		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.558	2.558	0	1236433	18	>100:1			5005.00	5179.87	98.8	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.567		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.818	2.818	0	593680	19	>100:1			1001.00	1066.40	94.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.818		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.827	2.836	0	140793	18	>100:1			1001.00	1017.46	96.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.827		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.855		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.208		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.174	3.174	0	98594	23	>100:1			5005.00	4623.95	96.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.188		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.194	3.201	0	617395	22	>100:1			1001.00	1083.28	102.7	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.194		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.569	3.577	0	126539	19	>100:1			1001.00	918.46	86.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.577		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.791		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.929		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.237		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.391		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.739		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.577	3.585	0	730679	21	>100:1			1001.00	1083.30	101.7	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.585		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.853	3.855	0	282009	19	>100:1			1001.00	1020.37	96.2	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.855		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.935	3.937	0	679686	18	>100:1			1001.00	1029.68	93.7	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.937		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.927	3.929	0	118747	20	>100:1			5005.00	5547.21	96.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.937		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.546		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.087	4.089	0	767026	18	>100:1			5005.00	5111.75	99.7	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.098		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.286	4.288	0	90289	16	>100:1			1001.00	1030.18	99.4	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.288		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.255	4.258	0	714836	16	>100:1			1001.00	1014.48	104.7	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.258		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.306	4.298	1	52857	16	>100:1			1001.00	1054.85	103.3	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.308		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.245	4.258	0	681591	16	>100:1			5005.00	5506.20	101.7	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.258		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.453	4.446	1	106314	17	>100:1			1001.00	1048.40	98.2	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.455		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.471	4.474	0	41874	18	>100:1			1001.00	927.28	103	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.483		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.526	4.528	0	744634	18	>100:1			1001.00	962.13	93.7	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.528		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.774		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		4.994	4.995	0	1036797	22	>100:1			1001.00	1063.16	99.9	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		4.995		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.401	5.397	1	952071	19	>100:1			1001.00	937.37	96.9	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.401	5.407	0/-1	7274	16	28:1	Target = 10.92		11.497	11.497		
813 > 269	40	5.401	5.407		669	20	18:1	10.87 (5.46-16.39)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													
913 > 869	40	5.797	5.801	0/-1	2354	16	7.0:1	Target = 14.05		2.7674	2.7674		
913 > 319	40	5.812	5.801		231	22	5.5:1	10.19 (7.02-21.07)					
*** 37 13C2_PFDA**													
515 > 470		3.935	3.937	0	737167	19	>100:1			200.00			
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.442	2.442	0	781242	18	>100:1			200.00			
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.194	3.201	0	610450	23	>100:1			200.00			
*** 43 13C3_PFBA**													
216 > 172		1.705	1.705	0	630338	22	>100:1			200.00			
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.577	3.577	0	124604	20	>100:1			200.00			

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Extract Dilution Preparations

537	**1X**	**5X**	**10X**	**20X**	**50X**	**100X**	**200X**	**500X**	**1000X**	**2000X**
EXTRACT (uL)	950	200	100	50	20	10	20	8	4	2
IS (uL)	50	40	45	47.5	49	49.5	199	199.6	199.8	199.9
96% MeOH (uL)	-	760	855	902.5	931	940.5	3781	3792.4	3796.2	3798.1
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/Vol	1/(Vol*0.2)	1/(Vol*0.1)	1/(Vol*0.05)	1/(Vol*0.02)	1/(Vol*0.01)	1/(Vol*0.005)	1/(Vol*0.002)	1/(Vol*0.001)	1/(Vol*0.0005)
ID Aq	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	(1/0.91)* (FV/V_o)	5* (FV/V_o)	10* (FV/V_o)	20* (FV/V_o)	50* (FV/V_o)	100* (FV/V_o)	200* (FV/V_o)	500* (FV/V_o)	1000* (FV/V_o)	2000* (FV/V_o)
DAI	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
SAMPLE (uL)	700	140	70	35	14	7	14	5.6	2.8	1.4
SUR (uL)	25	25	25	25	25	25	100	100	100	100
MeOH (uL)	275	275	275	275	275	275	1100	1100	1100	1100
Water (uL)	0	560	630	665	686	693	2786	2794.4	2797.2	2798.6
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/.7	1/.14	1/.07	1/.035	1/.014	1/.007	4/.014	4/.0056	4/.0028	4/.0014
ID Solid	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	((V_E/(M*S))/ 0.91)/1000	((V_E/(M*S))/ 0.2)/1000	((V_E/(M*S))/ 0.1)/1000	((V_E/(M*S))/ 0.05)/1000	((V_E/(M*S))/ 0.02)/1000	((V_E/(M*S))/ 0.01)/1000	((V_E/(M*S))/ 0.005)/1000	((V_E/ (M*S))/ 0.002)/1000	((V_E/ (M*S))/ 0.001)/1000	((V_E/ (M*S))/ 0.0005)/1000

NOTE: Dilutions of 100x or below will be prepped in 1-mL FV; dilutions higher than 100x and will be prepped in 4-mL FV.

Pace Environmental Services, LLC
Analyte Quantitation Report

SAMPLE CALC PFHxA REPORTED RESULT 22 NG/L

Data File: \\Organics\LL\LCMSMS01.i\091521-DOD+ICAL.b\091521042.d
Injection Date: 15-Sep-2021 19:14:20 Injection Vol: 10.0 uL ((561445 * 1000) / 1074702) / 1.063649 = 491.15
Sample Type: Client Auto Sampler: 26
Lab Sample ID: WH19014-001 Lab Prep. Batch: 15107
Client ID: AOPC14-SW01-EF-081821 Sample Group: WH19014 491.15 * 1 * 0.0452223 = 22.2 NG/L
Sample Info: WH19014-001 DOD Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Matrix: Aqueous
Final Conc.: Amt * DF * CF
Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0452223

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	243	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.721	1.721	0	1212955	19	>100:1			1001.00	1084.26	101.6	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													
212.9 > 168.9	46	1.727	1.727	0/0	308817	19	>100:1			225.49	10.197		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.110	2.110	0	1211927	15	>100:1			1001.00	1116.66	104.1	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													
262.9 > 218.9	50	2.110	2.110	0/0	285269	11	69:1			211.19	9.5504		M
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.162	2.162	0	365215	14	>100:1			1001.00	1032.52	97.2	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.162	2.162	0/0	272886	16	>100:1	Target = 3.57		541.33	24.480		
298.9 > 99	44	2.162	2.162		79158	17	>100:1	3.44 (1.78-5.36)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													
349 > 80	44	2.528	2.528	0/0	163131	14	>100:1	Target = 3.21		438.93	19.849		
349 > 99	44	2.528	2.528		54257	14	>100:1	3.00 (1.60-4.82)					M
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.450	2.459	0	433691	16	>100:1			5005.00	7058.50	132.3	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.459		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.493	2.493	0	1074702	17	>100:1			1001.00	1094.95	101.1	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													
313 > 269	49	2.493	2.493	0/0	561445	13	>100:1	Target = 16.78		491.65	22.233		
313 > 119	49	2.502	2.493		34023	13	>100:1	16.50 (8.39-25.17)					M
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.617	2.625	0	846511	18	>100:1			5005.00	5500.15	100.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.625		ND								

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **D. WILSON** **DATE:** **JANUARY 12, 2022**

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

SUBJECT: **ORGANIC DATA VALIDATION – POLYFLUOROALKYL SUBSTANCES (PFAS)**
NASA-AMES
SAMPLE DELIVERY GROUP (SDG) WK24009

SAMPLES: 4/Aqueous

B191-P-111221	SBOF-P-111221
SCOF-P-111221	SWRP-P-111221

Overview

The sample set for NASA-Ames, SDG WK24009, consisted of four (4) aqueous samples. All samples were analyzed for polyfluoroalkyl substances (PFAS).

The samples were collected by NASA on November 12, 2021 and analyzed by Pace Analytical Services. All analyses were conducted in accordance with Department of Defense ((DOD)/Department of Energy (DOE) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3, PFAS using LC/MS/MS Appendix B Table B-15 (2019). The data contained in this SDG was validated via EPA Stage 4 with regard to the following parameters:

* • Data completeness
* • Hold times/Sample Preservation
* • Mass Calibration
* • LC/MS/MS System Tuning and Performance
* • Mass Spectral Acquisition Rate
* • Instrument Sensitivity Check
* • Ion Transition Check
* • Ion Ratios
• Initial/Continuing Calibrations
• Laboratory Instrument / Method Blank Results
• Extraction Internal Standard Recoveries
* • Laboratory Control Sample Results
• Matrix Spike Results
• Laboratory Duplicate Results
* • Compound Identification
* • Compound Quantitation
* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, and documentation supporting these findings is presented in Appendix C.

PFAS

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

The matrix spike (MS) percent recovery for perfluorooctadecanoic acid (PFODA) was below the quality control limits for sample SBOF-P-111221. The nondetected result reported for PFODA in the affected sample was qualified as estimated (UJ).

Laboratory duplicate imprecision (relative percent difference greater than 20%) was noted for 6:2 fluorotelomer sulfonate (6:2FTS), perfluorobutanesulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorononanoic acid (PFNA), pentadecafluorooctanoic acid (PFOA) and perfluoropentanoic acid (PFPeA) for sample B191-P-111221. The detected results reported for these compounds in the affected sample were qualified as estimated (J).

The extracted internal standard recoveries for 13:C2-4:2FTS, 13C4-PFBA and 13C5-PFHxA were below the 50% quality control limit but greater than the 20% quality control limit for sample SWRP-P-111221. All other extracted internal standard recoveries were below the 20% quality control limit. The laboratory did not re-extract the sample. The detected results reported for perfluorobutanoic acid (PFBA) and perfluorohexanoic acid (PFHxA) were qualified as estimated biased high (J+). The nondetected result reported for 4:2 fluorotelomer sulfonate (4:2FTS) was qualified as estimated (UJ). The detected and nondetected results reported for the remaining compounds were qualified (X) and (UX), respectively.

The continuing calibration verifications performed on instrument LCMSMS01 on 12/10/2021 at 19:51 and 22:09 had percent recoveries below the 70% quality control limit for 10:2 fluorotelomer sulfonate (10:2FTS). All samples were affected. The nondetected results reported for 10:2FTS were qualified as estimated (UJ).

Additional Comments

The laboratory reported a sample ID as B1914-P-111221. The chain of custody listed the sample as B191-P-111221. The validator amended the Form I and electronic deliverable to match the chain of custody.

Non-detected results were reported to the limit of detection (LOD).

Instances of manual integrations were present in this data package. All manual integrations were documented by the laboratory and are noted in the raw data of the original data package.

The compounds perfluorohexanesulfonic acid (PFHxS) and perfluorooctanesulfonic acid (PFOS) for sample B191-P-111221 were analyzed at a 5X dilution.

A detected result for perfluorohexadecanoic acid (PFHxDA) (9.2049 ug/L) was present in the instrument blank analyzed on 12/10/2021. All samples were affected. No validation actions were required as all affected results were nondetects.

Executive Summary

Laboratory Performance Issues: Several extracted internal standard recoveries were below the quality control limits. Laboratory duplicate imprecision was noted for several compounds. Two continuing calibration percent recoveries were below the quality control limits.

Other Factors Affecting Data Quality: Detected results below the LOQ were estimated. One MS percent recovery was outside the quality control limits.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled “Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis be QSM Table B15” (May 1, 2020). The text of this report has been formulated to address only those areas affecting data quality.

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

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

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

Data Qualifier Definitions

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

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

Appendix A

Qualified Analytical Results

Qualifier Codes:

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

PROJ_NO: 09033A	NSAMPLE	B191-P-111221			B191-P-111221-DL			SBOF-P-111221			SCOF-P-111221		
SDG: WK24009	LAB_ID	WK24009-004			WK24009-004			WK24009-001			WK24009-003		
FRACTION: PFAS	SAMP_DATE	11/12/2021			11/12/2021			11/12/2021			11/12/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
10:2 FLUOROTELOMER SULFONATE (10:2FTS)		4.2	UJ	C				3.5	UJ	C	3.5	UJ	C
11CL-PF3OUDS		4.2	U					3.5	U		3.5	U	
2-(N-ETHYL PERFLUOROOCTANESULFONAMIDO-ETHANOL) (N-ETFOSE)		4.2	U					3.5	U		3.5	U	
2-(N-METHYL PERFLUOROOCTANESULFONAMIDO-ETHANOL) (N-MEFOSE)		4.2	U					3.5	U		3.5	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		4.2	U					3.5	U		3.5	U	
4:2 FLUOROTELOMER SULFONATE		4.2	U					3.5	U		3.5	U	
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		230	J	F				3.5	U		3.5	U	
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		30						3.5	U		3.5	U	
9CL-PF3ONS		4.2	U					3.5	U		3.5	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		4.2	U					3.5	U		3.5	U	
N-ETHYLPERFLUORO-1-OCTANESULFONAMIDE (N-ETFOSA)		4.2	U					3.5	U		3.5	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		4.2	U					3.5	U		3.5	U	
N-METHYLPERFLUORO-1-OCTANESULFONAMIDE (N-MEFOSA)		8.5	U					7	U		7	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		4.2	U					3.5	U		3.5	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		340	J	F				1.1	J	P	1.1	J	P
PERFLUOROBUTANESULFONIC ACID (PFBS)		130	J	F				4			1.3	J	P
PERFLUOROBUTANOIC ACID (PFBA)		66						2.9	J	P	1.5	J	P
PERFLUORODECANESULFONIC ACID (PFDS)		2.1	U					1.8	U		1.7	U	
PERFLUORODECANOIC ACID (PFDA)		1.1	J	P				1.8	U		1.7	U	
PERFLUORODODECANESULFONIC ACID (PFDOS)		4.2	U					3.5	U		3.5	U	
PERFLUORODODECANOIC ACID (PFDOA)		2.1	U					1.8	U		1.7	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		31						1.8	U		1.7	U	

PROJ_NO: 09033A	NSAMPLE	SWRP-P-111221		
SDG: WK24009	LAB_ID	WK24009-002		
FRACTION: PFAS	SAMP_DATE	11/12/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
10:2 FLUOROTELOMER SULFONATE (10:2FTS)		19	UX	N
11CL-PF3OUDS		19	UX	N
2-(N-ETHYL PERFLUOROOCTANESULFONAMIDO-ETHANOL) (N-ETFOSE)		19	UX	N
2-(N-METHYL PERFLUOROOCTANESULFONAMIDO-ETHANOL) (N-MEFOSE)		19	UX	N
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		19	UX	N
4:2 FLUOROTELOMER SULFONATE		19	UJ	N
6:2 FLUOROTELOMER SULFONATE (6:2FTS)		19	UX	N
8:2 FLUOROTELOMER SULFONATE (8:2FTS)		19	UX	N
9CL-PF3ONS		19	UX	N
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		19	UX	N
N-ETHYLPERFLUORO-1-OCTANESULFONAMIDE (N-ETFOSA)		19	UX	N
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		19	UX	N
N-METHYLPERFLUORO-1-OCTANESULFONAMIDE (N-MEFOSA)		38	UX	N
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		19	UX	N
PENTADECAFLUOROOCTANOIC ACID (PFOA)		21	X	N
PERFLUOROBUTANESULFONIC ACID (PFBS)		40	X	N
PERFLUOROBUTANOIC ACID (PFBA)		43	J+	N
PERFLUORODECANESULFONIC ACID (PFDS)		9.5	UX	N
PERFLUORODECANOIC ACID (PFDA)		9.5	UX	N
PERFLUORODODECANESULFONIC ACID (PFDOS)		19	UX	N
PERFLUORODODECANOIC ACID (PFDOA)		9.5	UX	N
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		9.5	UX	N

PROJ_NO: 09033A	NSAMPLE	B191-P-111221			B191-P-111221-DL			SBOF-P-111221			SCOF-P-111221		
SDG: WK24009	LAB_ID	WK24009-004			WK24009-004			WK24009-001			WK24009-003		
FRACTION: PFAS	SAMP_DATE	11/12/2021			11/12/2021			11/12/2021			11/12/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PERFLUOROHEPTANOIC ACID (PFHPA)		78	J	F				1.8	U		1.7	U	
PERFLUOROHEXADECANOIC ACID (PFHXDA)		4.2	U					3.5	U		3.5	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)					930			6			5.4		
PERFLUOROHEXANOIC ACID (PFHXA)		220						1.5	J	P	2.1	J	P
PERFLUORONONANESULFONIC ACID (PFNS)		2.1	U					1.8	U		1.7	U	
PERFLUORONONANOIC ACID (PFNA)		13	J	F				1.8	U		1.7	U	
PERFLUOROOCTADECANOIC ACID (PFODA)		4.2	U					3.5	UJ	D	3.5	U	
PERFLUOROOCTANE SULFONAMIDE (FOSA)		1.2	J	P				1.8	U		1.7	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)					1400			5.5			7.4		
PERFLUOROPENTANESULFONIC ACID (PFPES)		110						1.2	J	P	0.99	J	P
PERFLUOROPENTANOIC ACID (PFPEA)		160	J	F				1.7	J	P	1.1	J	P
PERFLUOROTETRADECANOIC ACID (PFTEA)		2.1	U					1.8	U		1.7	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2.1	U					1.8	U		1.7	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		2.1	U					1.8	U		1.7	U	

PROJ_NO: 09033A	NSAMPLE	SWRP-P-111221		
SDG: WK24009	LAB_ID	WK24009-002		
FRACTION: PFAS	SAMP_DATE	11/12/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PERFLUOROHEPTANOIC ACID (PFHPA)		14	X	NP
PERFLUOROHEXADECANOIC ACID (PFHXDA)		19	UX	N
PERFLUOROHEXANESULFONIC ACID (PFHXS)		86	X	N
PERFLUOROHEXANOIC ACID (PFHXA)		41	J+	N
PERFLUORONONANESULFONIC ACID (PFNS)		9.5	UX	N
PERFLUORONONANOIC ACID (PFNA)		9.5	UX	N
PERFLUOROOCTADECANOIC ACID (PFODA)		19	UX	N
PERFLUOROOCTANE SULFONAMIDE (FOSA)		9.5	UX	N
PERFLUOROOCTANESULFONIC ACID (PFOS)		100	X	N
PERFLUOROPENTANESULFONIC ACID (PFPES)		9	X	NP
PERFLUOROPENTANOIC ACID (PFPEA)		71	X	N
PERFLUOROTETRADECANOIC ACID (PFTEA)		9.5	UX	N
PERFLUOROTRIDECANOIC ACID (PFTRIA)		9.5	UX	N
PERFLUOROUNDECANOIC ACID (PFUNA)		9.5	UX	N

Appendix B

Results as Reported by the Laboratory

PFAS by LC/MS/MS

Client: BB&E, Inc.
Description: SBOF-P-111221
Date Sampled: 11/12/2021 1110
Date Received: 11/17/2021

Laboratory ID: WK24009-001
Matrix: Aqueous

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/10/2021 2033	MMM	12/08/2021 1451	24928

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2 FTS)	120226-60-0	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	7.0	U	14	7.0	3.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	4.0		3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.2	J	3.5	1.8	0.87	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	6.0		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.9	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.5	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	PFAS by ID SOP	3.5	US	7.0	3.5	1.7	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.1	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5.5		3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		115	50-150
13C2_6:2FTS		100	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		81	50-150
13C2_PFHxDA		84	50-150
13C2_PFTeDA		81	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Description: SBOF-P-111221
Date Sampled: 11/12/2021 1110
Date Received: 11/17/2021

Laboratory ID: WK24009-001
Matrix: Aqueous

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C3_PFBS		87	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		93	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		87	50-150
d-EtFOSA		91	50-150
d5-EtFOSAA		93	50-150
d9-EtFOSE		79	50-150
d-MeFOSA		81	50-150
d3-MeFOSAA		93	50-150
d7-MeFOSE		92	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: BB&E, Inc.
Description: SWRP-P-111221
Date Sampled: 11/12/2021 1120
Date Received: 11/17/2021

Laboratory ID: WK24009-002
Matrix: Aqueous

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/10/2021 2054	MMM	12/08/2021 1451	24928

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2 FTS)	120226-60-0	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	38	UQ	75	38	19	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	40	Q	19	9.5	4.7	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	9.0	JQ	19	9.5	4.7	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	86	Q	19	9.5	4.7	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	43	Q	19	9.5	4.7	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	14	JQ	19	9.5	4.7	ng/L	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	41	Q	19	9.5	4.7	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	PFAS by ID SOP	19	UQ	38	19	9.4	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	21	Q	19	9.5	4.7	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	71	Q	19	9.5	4.7	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	9.5	UQ	19	9.5	4.7	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	100	Q	19	9.5	4.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	20	50-150
13C2_6:2FTS	N	19	50-150
13C2_8:2FTS	N	17	50-150
13C2_PFDoA	N	17	50-150
13C2_PFHxDA	N	16	50-150
13C2_PFTeDA	N	15	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Description: SWRP-P-111221
Date Sampled: 11/12/2021 1120
Date Received: 11/17/2021

Laboratory ID: WK24009-002
Matrix: Aqueous

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C3_PFBS	N	18	50-150
13C3_PFHxS	N	18	50-150
13C3-HFPO-DA	N	18	50-150
13C4_PFBA	N	20	50-150
13C4_PFHpA	N	19	50-150
13C5_PFHxA	N	20	50-150
13C5_PFPeA	N	18	50-150
13C6_PFDA	N	16	50-150
13C7_PFUdA	N	17	50-150
13C8_PFOA	N	17	50-150
13C8_PFOS	N	17	50-150
13C8_PFOSA	N	19	50-150
13C9_PFNA	N	17	50-150
d-EtFOSA	N	16	50-150
d5-EtFOSAA	N	19	50-150
d9-EtFOSE	N	15	50-150
d-MeFOSA	N	13	50-150
d3-MeFOSAA	N	18	50-150
d7-MeFOSE	N	19	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: BB&E, Inc.
Description: SCOF-P-111221
Date Sampled: 11/12/2021 1130
Date Received: 11/17/2021

Laboratory ID: WK24009-003
Matrix: Aqueous

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/10/2021 2105	MMM	12/08/2021 1451	24928

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2 FTS)	120226-60-0	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	7.0	U	14	7.0	3.4	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.3	J	3.4	1.7	0.86	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	0.99	J	3.4	1.7	0.86	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.4		3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.5	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.1	J	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	7.4		3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		112	50-150
13C2_6:2FTS		120	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		93	50-150
13C2_PFHxDA		95	50-150
13C2_PFTeDA		96	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Description: SCOF-P-111221
Date Sampled: 11/12/2021 1130
Date Received: 11/17/2021

Laboratory ID: WK24009-003
Matrix: Aqueous

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C3_PFBS		101	50-150
13C3_PFHxS		100	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		98	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		102	50-150
13C8_PFOS		103	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		95	50-150
d-EtFOSA		85	50-150
d5-EtFOSAA		99	50-150
d9-EtFOSE		93	50-150
d-MeFOSA		88	50-150
d3-MeFOSAA		98	50-150
d7-MeFOSE		108	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Description: B1914-P-111221
Date Sampled: 11/12/2021 1440
Date Received: 11/17/2021

TLS
01/12/2022

Laboratory ID: WK24009-004
Matrix: Aqueous

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/10/2021 2116	MMM	12/08/2021 1451	24928
2	SOP SPE	PFAS by ID SOP QSM B-15	5	12/11/2021 2330	MMM	12/08/2021 1451	24928

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	30		8.3	4.2	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	230		8.3	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorododecane sulfonic acid (10:2 FTS)	120226-60-0	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	8.5	U	17	8.5	4.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	130		4.1	2.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	31		4.1	2.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	1.2	J	4.1	2.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	110		4.1	2.1	1.0	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	930		21	11	5.2	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	66		4.1	2.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.1	J	4.1	2.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	78		4.1	2.1	1.0	ng/L	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	220		4.1	2.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	13		4.1	2.1	1.0	ng/L	1
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	PFAS by ID SOP	4.2	U	8.3	4.2	2.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	340		4.1	2.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	160		4.1	2.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.1	U	4.1	2.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1400		21	11	5.2	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		102	50-150		107	50-150
13C2_6:2FTS		84	50-150		93	50-150
13C2_8:2FTS		69	50-150		87	50-150
13C2_PFDoA		62	50-150		91	50-150
13C2_PFHxDA		65	50-150		105	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: BB&E, Inc.
Description: B1914-P-111221
Date Sampled: 11/12/2021 1440
Date Received: 11/17/2021

Laboratory ID: WK24009-004
Matrix: Aqueous

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_PFTeDA		53	50-150		87	50-150
13C3_PFBS		77	50-150		93	50-150
13C3_PFHxS		76	50-150		89	50-150
13C3-HFPO-DA		74	50-150		100	50-150
13C4_PFBA		76	50-150		91	50-150
13C4_PFHpA		72	50-150		86	50-150
13C5_PFHxA		76	50-150		90	50-150
13C5_PFPeA		73	50-150		88	50-150
13C6_PFDA		69	50-150		93	50-150
13C7_PFUdA		65	50-150		81	50-150
13C8_PFOA		73	50-150		94	50-150
13C8_PFOS		69	50-150		84	50-150
13C8_PFOSA		69	50-150		94	50-150
13C9_PFNA		63	50-150		90	50-150
d-EtFOSA		66	50-150		97	50-150
d5-EtFOSAA		70	50-150		95	50-150
d9-EtFOSE		63	50-150		84	50-150
d-MeFOSA		57	50-150		80	50-150
d3-MeFOSAA		70	50-150		89	50-150
d7-MeFOSE		66	50-150		93	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Appendix C

Support Documentation

SHEALY

Chain of Custody Record

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number

Client: BBE	Report to Contact: brian.d.reddig@nasa.gov	Telephone No. / E-mail: 408-903-7672	Quote No.
Address: NASA Ames	Sampler's Signature: X [signature]	Analysis (Attach list if more space is needed): Full List 36 PFAS by Dod ID	Page 1 of 1
City: Moffat Field; State: CA; Zip Code: 94035	Printed Name: BR/MN/JZ		
Project Name: PFAS Outfall			
Project Number:	P.O No.		

WK24009

MKM

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	See above	Remarks / Cooler I.D.
SBOF-P-111221	11-12-21	1110	G	X									X	
SWRP-P-111221	↓	1120	G	X									X	
SCOF-P-111221	↓	1130	G	X									X	
B191-P-111221	11-12-21	1440	G	X									X	

Turn Around Time Required (Prior lab approval required for expedited TAT): [X] Standard [ ] Rush (Please Specify)

Sample Disposal: [ ] Return to Client [X] Disposal by Lab

Possible Hazard Identification (List any known hazards in the remarks): [X] Non-Hazardous [ ] Flammable [ ] Skin Irritant [ ] SDS provided [ ] Unknown

QC Requirements

	Date	Time		Date	Time
1. Relinquished by: [signature]	11-15-21	1130	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fedex	11/17/21	1605	4. Laboratory Received by: [signature]	11/17/21	1605

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Check) [ ] Y [ ] N [ ] Ice Pack

Receipt Temp. 3.1 °C

Document Number: ME002OW-01

Sample Summary
BB&E, Inc.
Lot Number: WK24009

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	SBOF-P-111221	Aqueous	11/12/2021 1110	11/17/2021
002	SWRP-P-111221	Aqueous	11/12/2021 1120	11/17/2021
003	SCOF-P-111221	Aqueous	11/12/2021 1130	11/17/2021
004	B1914-P-111221	Aqueous	11/12/2021 1440	11/17/2021

(4 samples)

Case Narrative
BB&E, Inc.
Lot Number: WK24009

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs, the DoD QSM, or policies are qualified on the results page or discussed below.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation:

Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, Fecal Coliform SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, Solid Chemical Material: TOC Walkley-Black.

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

Sample Notes:

Sample matrix for the listed samples prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Recoveries for the Surrogates (SUR; Extracted Internal Standard/EIS) were outside control limits for the first listed sample. As evidence of matrix interference is present, re-extraction/re-analysis was not performed. Results for the first listed sample are qualified “Q”.
WK24009-002 (SWRP-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-004 (B1914-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)

The continuing calibration verification (CCV) associated with the listed samples exceeded limits with a positive bias for the 6:2 FTS surrogate (SUR; Extracted Internal Standard/EIS). The associated target analyte passed; therefore, the data has been reported.
WK24009-001 (SBOF-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-002 (SWRP-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-003 (SCOF-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive

List PFAS by Isotope Dilution (DOD)
WK24009-004 (B1914-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)

6:2 FTS surrogate (SUR; Extracted Internal Standard/EIS) recovery for the method blank (MB) associated with the listed samples exceeded the upper control limit. The MB did not contain the associated target analyte; therefore, re-extraction/re-analysis was not performed.
WK24009-001 (SBOF-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-002 (SWRP-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-003 (SCOF-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)
WK24009-004 (B1914-P-111221) (Run 1) (Analysis Batch 25247) (Prep Batch 24928) Comprehensive List PFAS by Isotope Dilution (DOD)

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

Cs is on column concentration of target analyte in the sample (ng/L)
Cis is concentration of internal standard in the sample (ng/L)
As is peak response of target analyte in the sample
Ais is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

CLIENT SAMPLE ID

WQ24928-001

FORM 4
METHOD BLANK SUMMARY

Lab Name: Pace Analytical Services, LLC
Lot No.: WK24009
Project No.:
Lab Sample ID: WQ24928-001
Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Water
Instrument ID: Sciex 4500_LCMSMS1
Lab File ID: WQ24928-001.txt
Extraction Type: SOP SPE
Date Extracted: 12/08/2021
LC Column: Gemini C18 ID: 2.00 (mm)
Date Analyzed: 12/10/2021
Time Analyzed: 19:19

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE/TIME ANALYZED
SBOF-P-111221	WK24009-001	WK24009-001.txt	20:33
SWRP-P-111221	WK24009-002	WK24009-002.txt	20:54
SCOF-P-111221	WK24009-003	WK24009-003.txt	21:05
B1914-P-111221	WK24009-004	WK24009-004.txt	21:16
B1914-P-111221	WK24009-004	WK24009-004.txt	23:30
WQ24928-002	WQ24928-002	WQ24928-002.txt	17:37
SBOF-P-111221MS	WK24009-001MS	WK24009-001MS.txt	20:44
B1914-P-111221DUP	WK24009-004DUP	WK24009-004DU.txt	21:26

PFAS by LC/MS/MS - MB

Sample ID: WQ24928-001
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
10:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
EtFOSA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
EtFOSE	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
MeFOSA	8.0	U	1	16	8.0	4.0	ng/L	12/10/2021 1919
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
MeFOSE	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFOSA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFDOS	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFHxDA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFODA	4.0	U	1	8.0	4.0	2.0	ng/L	12/10/2021 1919
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	12/10/2021 1919

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		136	50-150
13C2_6:2FTS	N	195	50-150
13C2_8:2FTS		106	50-150
13C2_PFDoA		97	50-150
13C2_PFHxDA		55	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MB

Sample ID: WQ24928-001
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Surrogate	Q	% Rec	Acceptance Limit
13C2_PFTeDA		75	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		110	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBA		109	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		117	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		101	50-150
13C8_PFOA		121	50-150
13C8_PFOS		103	50-150
13C8_PFOSA		102	50-150
13C9_PFNA		99	50-150
d-EtFOSA		95	50-150
d5-EtFOSAA		102	50-150
d9-EtFOSE		98	50-150
d-MeFOSA		80	50-150
d3-MeFOSAA		103	50-150
d7-MeFOSE		113	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ24928-002
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	97	70-150	12/14/2021 1737
11Cl-PF3OUdS	15	13		1	89	70-150	12/14/2021 1737
8:2 FTS	15	16		1	104	67-138	12/14/2021 1737
6:2 FTS	15	15		1	101	64-140	12/14/2021 1737
10:2 FTS	15	16		1	101	70-150	12/14/2021 1737
4:2 FTS	15	15		1	103	63-143	12/14/2021 1737
GenX	32	32		1	99	70-150	12/14/2021 1737
ADONA	15	15		1	100	70-150	12/14/2021 1737
EtFOSA	16	20		1	123	70-150	12/14/2021 1737
EtFOSAA	16	16		1	103	61-135	12/14/2021 1737
EtFOSE	16	16		1	102	70-150	12/14/2021 1737
MeFOSA	16	18		1	112	68-141	12/14/2021 1737
MeFOSAA	16	17		1	106	65-136	12/14/2021 1737
MeFOSE	16	16		1	99	70-150	12/14/2021 1737
PFBS	14	15		1	108	72-130	12/14/2021 1737
PFDS	15	14		1	91	53-142	12/14/2021 1737
PFHpS	15	16		1	102	69-134	12/14/2021 1737
PFNS	15	15		1	98	69-127	12/14/2021 1737
PFOSA	16	17		1	106	67-137	12/14/2021 1737
PFPeS	15	17		1	113	71-127	12/14/2021 1737
PFDOS	15	11		1	68	60-135	12/14/2021 1737
PFHxS	15	15		1	101	68-131	12/14/2021 1737
PFBA	16	16		1	103	73-129	12/14/2021 1737
PFDA	16	15		1	95	71-129	12/14/2021 1737
PFDoA	16	18		1	114	72-134	12/14/2021 1737
PFHpA	16	16		1	101	72-130	12/14/2021 1737
PFHxDA	16	15		1	92	60-135	12/14/2021 1737
PFHxA	16	16		1	98	72-129	12/14/2021 1737
PFNA	16	16		1	99	69-130	12/14/2021 1737
PFODA	16	12		1	72	60-135	12/14/2021 1737
PFOA	16	17		1	105	71-133	12/14/2021 1737
PFPeA	16	16		1	101	72-129	12/14/2021 1737
PFTeDA	16	16		1	101	71-132	12/14/2021 1737
PFTrDA	16	14		1	89	65-144	12/14/2021 1737
PFUdA	16	17		1	106	69-133	12/14/2021 1737
PFOS	15	14		1	96	65-140	12/14/2021 1737

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		99	50-150
13C2_6:2FTS		107	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		76	50-150
13C2_PFHxDA		68	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - LCS

Sample ID: WQ24928-002
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Surrogate	Q	% Rec	Acceptance Limit
13C2_PFTeDA		74	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		97	50-150
13C6_PFDA		98	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		96	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		101	50-150
d-EtFOSA		79	50-150
d5-EtFOSAA		92	50-150
d9-EtFOSE		88	50-150
d-MeFOSA		75	50-150
d3-MeFOSAA		104	50-150
d7-MeFOSE		89	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WK24009-001MS
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	14		1	106	70-150	12/10/2021 2044
11Cl-PF3OUdS	ND	13	12		1	93	70-150	12/10/2021 2044
8:2 FTS	ND	13	13		1	99	67-138	12/10/2021 2044
6:2 FTS	ND	13	14		1	105	64-140	12/10/2021 2044
10:2 FTS	ND	14	9.7		1	72	70-150	12/10/2021 2044
4:2 FTS	ND	13	16		1	121	63-143	12/10/2021 2044
GenX	ND	28	30		1	106	70-150	12/10/2021 2044
ADONA	ND	13	14		1	107	70-150	12/10/2021 2044
EtFOSA	ND	14	14		1	102	70-150	12/10/2021 2044
EtFOSAA	ND	14	13		1	93	61-135	12/10/2021 2044
EtFOSE	ND	14	15		1	108	70-150	12/10/2021 2044
MeFOSA	ND	14	16		1	114	68-141	12/10/2021 2044
MeFOSAA	ND	14	14		1	97	65-136	12/10/2021 2044
MeFOSE	ND	14	13		1	96	70-150	12/10/2021 2044
PFBS	4.0	12	16		1	100	72-130	12/10/2021 2044
PFDS	ND	14	14		1	100	53-142	12/10/2021 2044
PFHpS	ND	13	15		1	111	69-134	12/10/2021 2044
PFNS	ND	13	13		1	98	69-127	12/10/2021 2044
PFOSA	ND	14	14		1	99	67-137	12/10/2021 2044
PFPeS	1.2	13	14		1	99	71-127	12/10/2021 2044
PFDOS	ND	14	13		1	97	60-135	12/10/2021 2044
PFHxS	6.0	13	20		1	111	68-131	12/10/2021 2044
PFBA	2.9	14	18		1	110	73-129	12/10/2021 2044
PFDA	ND	14	16		1	116	71-129	12/10/2021 2044
PFDoA	ND	14	16		1	115	72-134	12/10/2021 2044
PFHpA	ND	14	16		1	117	72-130	12/10/2021 2044
PFHxDA	ND	14	14		1	101	60-135	12/10/2021 2044
PFHxA	1.5	14	17		1	109	72-129	12/10/2021 2044
PFNA	ND	14	16		1	113	69-130	12/10/2021 2044
PFODA	ND	14	7.1	N	1	50	60-135	12/10/2021 2044
PFOA	1.1	14	16		1	108	71-133	12/10/2021 2044
PFPeA	1.7	14	17		1	110	72-129	12/10/2021 2044
PFTeDA	ND	14	15		1	108	71-132	12/10/2021 2044
PFTrDA	ND	14	16		1	111	65-144	12/10/2021 2044
PFUdA	ND	14	16		1	112	69-133	12/10/2021 2044
PFOS	5.5	13	20		1	109	65-140	12/10/2021 2044

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		106	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		83	50-150
13C2_PFHxDA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: WK24009-001MS
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Surrogate	Q	% Rec	Acceptance Limit
13C2_PFTeDA		76	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		87	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		92	50-150
13C8_PFOS		90	50-150
13C8_PFOSA		89	50-150
13C9_PFNA		82	50-150
d-EtFOSA		85	50-150
d5-EtFOSAA		95	50-150
d9-EtFOSE		88	50-150
d-MeFOSA		77	50-150
d3-MeFOSAA		90	50-150
d7-MeFOSE		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WK24009-004DU
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	12/10/2021 2126
11Cl-PF3OUdS	ND	ND		1	0.00	20	12/10/2021 2126
8:2 FTS	30	26		1	14	20	12/10/2021 2126
6:2 FTS	230	170	+	1	30	20	12/10/2021 2126
10:2 FTS	ND	ND		1	0.00	20	12/10/2021 2126
4:2 FTS	ND	ND		1	0.00	20	12/10/2021 2126
GenX	ND	ND		1	0.00	20	12/10/2021 2126
ADONA	ND	ND		1	0.00	20	12/10/2021 2126
EtFOSA	ND	ND		1	0.00	20	12/10/2021 2126
EtFOSAA	ND	ND		1	0.00	20	12/10/2021 2126
EtFOSE	ND	ND		1	0.00	20	12/10/2021 2126
MeFOSA	ND	ND		1	0.00	20	12/10/2021 2126
MeFOSAA	ND	ND		1	0.00	20	12/10/2021 2126
MeFOSE	ND	ND		1	0.00	20	12/10/2021 2126
PFBS	130	95	+	1	30	20	12/10/2021 2126
PFDS	ND	ND		1	0.00	20	12/10/2021 2126
PFHpS	31	26		1	17	20	12/10/2021 2126
PFNS	ND	ND		1	0.00	20	12/10/2021 2126
PFOSA	1.2	ND		1	0.00	20	12/10/2021 2126
PFPeS	110	94		1	20	20	12/10/2021 2126
PFDOS	ND	ND		1	0.00	20	12/10/2021 2126
PFHxS	1000	820	E	1	20	20	12/10/2021 2126
PFBA	66	54		1	19	20	12/10/2021 2126
PFDA	1.1	ND		1	0.00	20	12/10/2021 2126
PFDoA	ND	ND		1	0.00	20	12/10/2021 2126
PFHpA	78	56	+	1	33	20	12/10/2021 2126
PFHxDA	ND	ND		1	0.00	20	12/10/2021 2126
PFHxA	220	190		1	16	20	12/10/2021 2126
PFNA	13	11	+	1	22	20	12/10/2021 2126
PFODA	ND	ND		1	0.00	20	12/10/2021 2126
PFOA	340	260	+	1	25	20	12/10/2021 2126
PFPeA	160	120	+	1	31	20	12/10/2021 2126
PFTeDA	ND	ND		1	0.00	20	12/10/2021 2126
PFTrDA	ND	ND		1	0.00	20	12/10/2021 2126
PFUdA	ND	ND		1	0.00	20	12/10/2021 2126
PFOS	1500	1300	E	1	19	20	12/10/2021 2126

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		123	50-150
13C2_6:2FTS		106	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		82	50-150
13C2_PFHxDA		79	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: WK24009-004DU
Batch: 24928
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/08/2021 1451

Surrogate	Q	% Rec	Acceptance Limit
13C2_PFTeDA		79	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		90	50-150
13C8_PFOS		84	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		77	50-150
d-EtFOSA		93	50-150
d5-EtFOSAA		93	50-150
d9-EtFOSE		87	50-150
d-MeFOSA		86	50-150
d3-MeFOSAA		90	50-150
d7-MeFOSE		103	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Pace Analytical Services, LLC Lot No.: WK24009

Project No.:

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS1	IDS2	IDS3	IDS4	IDS5	IDS6	IDS7	IDS8	IDS9
SBOF-P-111221	115	100	100	81	84	81	87	98	88
SWRP-P-111221	20 *	19 *	17 *	17 *	16 *	15 *	18 *	18 *	18 *
SCOF-P-111221	112	120	94	93	95	96	101	100	97
B1914-P-111221	102	84	69	62	65	53	77	76	74
B1914-P-111221	107	93	87	91	105	87	93	89	100
WQ24928-001	136	195 *	106	97	55	75	110	110	100
WQ24928-002	99	107	87	76	68	74	87	90	103
SBOF-P-111221MS	92	106	93	83	79	76	94	95	88
B1914-P-111221DUP	123	106	89	82	79	79	95	89	87

IDS1 = 13C2_4:2FTS
IDS2 = 13C2_6:2FTS
IDS3 = 13C2_8:2FTS
IDS4 = 13C2_PFDoA
IDS5 = 13C2_PFHxDA
IDS6 = 13C2_PFTeDA
IDS7 = 13C3_PFBS
IDS8 = 13C3_PFHxS
IDS9 = 13C3-HFPO-DA

QC LIMITS
50-150
50-150
50-150
50-150
50-150
50-150
50-150
50-150
50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Pace Analytical Services, LLC Lot No.: WK24009

Project No.:

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS10	IDS11	IDS12	IDS13	IDS14	IDS15	IDS16	IDS17	
SBOF-P-111221	94	95	94	83	96	84	93	89	
SWRP-P-111221	20 *	19 *	20 *	18 *	16 *	17 *	17 *	17 *	
SCOF-P-111221	102	102	101	91	98	87	102	103	
B1914-P-111221	76	72	76	73	69	65	73	69	
B1914-P-111221	91	86	90	88	93	81	94	84	
WQ24928-001	109	102	117	96	103	101	121	103	
WQ24928-002	93	93	89	97	98	91	96	98	
SBOF-P-111221MS	94	89	90	87	87	84	92	90	
B1914-P-111221DUP	87	90	96	89	89	88	90	84	

	QC LIMITS
IDS10 = 13C4_PFBA	50-150
IDS11 = 13C4_PFHpA	50-150
IDS12 = 13C5_PFHxA	50-150
IDS13 = 13C5_PFPeA	50-150
IDS14 = 13C6_PFDA	50-150
IDS15 = 13C7_PFUdA	50-150
IDS16 = 13C8_PFOA	50-150
IDS17 = 13C8_PFOS	50-150

* Recoveries outside QC limits
D IDS Diluted Out

FORM 2
ISOTOPE DILUTION STANDARD RECOVERY

Lab Name: Pace Analytical Services, LLC Lot No.: WK24009

Project No.:

AnalyticalMethod: PFAS by ID SOP QSM B-15 Matrix: Water

CLIENT SAMPLE ID	IDS18	IDS19	IDS20	IDS21	IDS22	IDS23	IDS24	IDS25	TOT OUT
SBOF-P-111221	87	87	91	93	79	81	93	92	0
SWRP-P-111221	19 *	17 *	16 *	19 *	15 *	13 *	18 *	19 *	25
SCOF-P-111221	101	95	85	99	93	88	98	108	0
B1914-P-111221	69	63	66	70	63	57	70	66	0
B1914-P-111221	94	90	97	95	84	80	89	93	0
WQ24928-001	102	99	95	102	98	80	103	113	1
WQ24928-002	91	101	79	92	88	75	104	89	0
SBOF-P-111221MS	89	82	85	95	88	77	90	90	0
B1914-P-111221DUP	84	77	93	93	87	86	90	103	0

	QC LIMITS
IDS18 = 13C8_PFOSA	50-150
IDS19 = 13C9_PFNA	50-150
IDS20 = d-EtFOSA	50-150
IDS21 = d5-EtFOSAA	50-150
IDS22 = d9-EtFOSE	50-150
IDS23 = d-MeFOSA	50-150
IDS24 = d3-MeFOSAA	50-150
IDS25 = d7-MeFOSE	50-150

* Recoveries outside QC limits
D IDS Diluted Out

Report Date: 09-Dec-2021 08:50:17 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 08-Dec-2021 16:22:41 Cal End Date: 08-Dec-2021 17:57:54
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	120821014.d	ICAL 50_SVLC-1740	08-Dec-2021 16:22:41
2	120821015.d	ICAL 100_SVLC-1741	08-Dec-2021 16:33:13
3	120821016.d	ICAL 200_SVLC-1742	08-Dec-2021 16:43:46
4	120821017.d	ICAL 500_SVLC-1743	08-Dec-2021 16:54:20
5	120821018.d	ICAL 1000_SVLC-1761	08-Dec-2021 17:04:53
6	120821019.d	ICAL 2000_SVLC-1745	08-Dec-2021 17:15:28
7	120821020.d	ICAL 5000_SVLC-1746	08-Dec-2021 17:26:02
8	120821021.d	ICAL 10000_SVLC-1747	08-Dec-2021 17:36:39
9	120821022.d	ICAL 15000_SVLC-1748	08-Dec-2021 17:47:15
10	120821023.d	ICAL 20000_SVLC-1749	08-Dec-2021 17:57:54

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	Avg. +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.362	3.956	3.472	3.902	3.635	3.974	3.723	3.861	3.865	3.850	3.760	3.092-4.427	0.22242	1.880
1 4:2 FTS	1.123	1.612	1.175	1.434	1.839	1.596	1.532	1.530	1.634	1.612	1.508	0.883-2.134	0.20851	0.754
15 PFHxA	16.703	18.787	19.561	16.397	18.109	17.965	16.716	17.604	17.158	17.440	17.644	14.612-20.675	1.01053	8.822
22 PFPeS	2.890	2.902	3.778	3.320	3.650	3.212	3.494	3.570	3.395	3.467	3.367	2.462-4.273	0.30181	1.683
28 GenX	0.728	0.718	0.780	0.786	0.768	0.722	0.706	0.775	0.753	0.755	0.749	0.666-0.832	0.02766	0.374
13 PFHpA	3.077	3.147	3.044	2.926	2.938	3.125	2.889	2.809	2.967	2.838	2.976	2.602-3.349	0.12464	1.488
14 PFHxS	3.802	3.407	3.677	3.457	3.127	3.550	3.452	3.300	3.440	3.468	3.468	2.936-3.999	0.17713	1.734
29 ADONA	2.377	2.694	2.545	2.401	2.296	2.426	2.452	2.255	2.250	2.234	2.393	1.967-2.818	0.14175	1.196
2 6:2 FTS	Disabled	1.290	1.356	1.249	1.305	1.204	1.329	1.296	1.359	1.304	1.299	1.144-1.453	0.05158	0.649
20 PFOA	2.358	2.344	2.600	2.755	2.585	2.566	2.569	2.488	2.442	2.358	2.506	2.088-2.924	0.13937	1.253
12 PFHpS	4.048	3.530	3.504	3.598	3.652	3.743	3.634	3.681	3.650	3.615	3.665	3.213-4.117	0.15058	1.832
18 PFOS	3.728	4.694	3.987	3.759	3.835	3.779	3.864	4.061	3.851	3.975	3.953	3.042-4.864	0.30375	1.976
17 PFNA	4.784	4.945	4.609	4.793	4.689	4.792	4.701	4.667	4.623	4.451	4.705	4.262-5.148	0.14777	2.352
19 PFOSA	45.791	50.496	36.946	41.563	47.339	49.526	39.961	47.154	44.731	44.718	44.822	31.006-58.638	4.60536	22.411
16 PFNS	5.055	3.274	4.841	3.596	3.753	3.543	3.690	3.688	3.965	3.773	3.917	2.073-5.762	0.61487	1.958
3 8:2 FTS	1.472	2.241	1.397	1.492	1.366	1.455	1.360	1.558	1.433	1.403	1.517	0.751-2.284	0.25554	0.758
10 PFDA	8.872	9.569	10.847	8.633	10.750	9.763	10.163	9.137	8.844	9.700	9.627	7.290-11.964	0.77906	4.813
6 N-MeFOSAA	1.754	1.645	1.408	1.341	1.383	1.429	1.403	1.396	1.473	1.364	1.459	0.973-1.946	0.16216	0.729
9 PFDS	4.029	4.005	3.653	3.297	3.673	3.397	3.397	3.631	3.819	3.725	3.662	2.574-4.751	0.36286	1.831
25 PFUdA	10.009	9.924	9.164	10.871	8.912	10.073	11.031	10.196	9.247	9.149	9.857	7.720-11.994	0.71224	4.928
5 N-EtFOSAA	Disabled	1.688	1.723	1.596	1.908	1.654	1.671	1.722	1.616	1.663	1.693	1.411-1.975	0.09400	0.846
26 MeFOSA	0.882	1.546	1.502	1.233	0.999	1.096	1.097	1.036	1.106	1.135	1.163	0.500-1.826	0.22100	0.581
27 EtFOSA	0.884	1.115	0.908	1.058	1.015	1.088	1.146	1.078	1.002	1.112	1.040	0.762-1.318	0.09268	0.520
11 PFDoA	5.189	6.068	7.629	6.596	6.957	7.461	6.903	7.124	7.094	6.591	6.761	4.687-8.834	0.69114	3.380
4 10:2 FTS	3.352	2.192	2.482	2.673	2.270	2.518	2.376	2.364	2.327	2.408	2.496	1.490-3.502	0.33530	1.248
34 PFDOS	3.077	3.896	3.506	3.579	3.410	3.638	3.541	3.490	3.555	3.700	3.539	2.907-4.170	0.21057	1.769
24 PFTrDA	3.051	2.867	2.796	2.631	2.695	2.938	2.976	2.960	3.189	3.134	2.923	2.390-3.456	0.17758	1.461
23 PFTeDA	7.678	7.227	7.800	8.059	7.417	7.504	8.180	7.642	7.471	7.130	7.610	6.542-8.679	0.35610	3.805
35 PFHxDA	11.652	11.874	13.090	12.756	12.918	12.611	12.050	12.871	12.670	13.367	12.585	10.876-14.294	0.56967	6.292
36 PFODA	165.040	148.756	142.104	145.435	138.057	153.838	142.492	162.958	164.150	173.211	153.604	16.795-190.41	12.2694(	76.802

Report Date: 09-Dec-2021 08:50:16 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 08-Dec-2021 16:22:41 Cal End Date: 08-Dec-2021 17:57:54

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	120821014.d	ICAL 50_SVLC-1740	08-Dec-2021 16:22:41
2	120821015.d	ICAL 100_SVLC-1741	08-Dec-2021 16:33:13
3	120821016.d	ICAL 200_SVLC-1742	08-Dec-2021 16:43:46
4	120821017.d	ICAL 500_SVLC-1743	08-Dec-2021 16:54:20
5	120821018.d	ICAL 1000_SVLC-1761	08-Dec-2021 17:04:53
6	120821019.d	ICAL 2000_SVLC-1745	08-Dec-2021 17:15:28
7	120821020.d	ICAL 5000_SVLC-1746	08-Dec-2021 17:26:02
8	120821021.d	ICAL 10000_SVLC-1747	08-Dec-2021 17:36:39
9	120821022.d	ICAL 15000_SVLC-1748	08-Dec-2021 17:47:15
10	120821023.d	ICAL 20000_SVLC-1749	08-Dec-2021 17:57:54

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	1063	1159	1148	1003	1177	1097	980	1005	937	988	Avg:A Wt:C2	1056		RSD=8.1	
	100.7	109.8	108.8	95	111.5	103.9	92.9	95.2	88.7	93.6	Org:N Dep:R				
8 PFBA	1.105617	1.060063	1.070245	1.081028	0.970749	1.066182	1.117837	1.042375	1.043255	0.991901	Avg:A Wt:C2	1.054925		RSD=4.3	
	104.8	100.5	101.5	102.5	92	101.1	106	98.8	98.9	94	Org:N Dep:R				
D 50 13C5_PFPeA	942	1007	1035	903	996	998	929	929	871	921	Avg:A Wt:C2	953		RSD=5.5	
	98.8	105.7	108.6	94.7	104.5	104.7	97.4	97.5	91.4	96.6	Org:N Dep:R				
21 PFPeA	1.086739	1.098454	1.097681	1.115079	1.034256	1.095753	1.093542	1.069272	1.065285	1.034228	Avg:A Wt:C2	1.079029		RSD=2.6	
	100.7	101.8	101.7	103.3	95.9	101.5	101.3	99.1	98.7	95.8	Org:N Dep:R				
D 44 13C3_PFBS	329	343	339	311	349	332	312	328	294	322	Avg:A Wt:C2	326		RSD=5.1	
	100.8	105.3	104	95.3	107	102	95.7	100.7	90.2	98.9	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
7 PFBS	1.510773	1.624484	1.442087	1.355213	1.231671	1.297834	1.271889	1.261593	1.288440	1.272885	Avg:A Wt:C2	1.355687		RSD=9.5	
	111.4	119.8	106.4	100	90.9	95.7	93.8	93.1	95	93.9	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	46.9066	50.9228	52.6770	44.2100	56.0910	47.8256	48.6152	49.6710	44.2626	52.2938	Avg:A Wt:C2	49.3476		RSD=7.7	
	95.1	103.2	106.7	89.6	113.7	96.9	98.5	100.7	89.7	106	Org:N Dep:R				
1 4:2 FTS	2.012747	1.966911	1.833626	1.859821	1.801466	1.956050	1.725080	1.762460	1.843483	1.707792	Avg:A Wt:C2	1.846944		RSD=5.6	
	109	106.5	99.3	100.7	97.5	105.9	93.4	95.4	99.8	92.5	Org:N Dep:R				
D 49 13C5_PFHxA	894	944	869	811	1044	906	830	873	788	832	Avg:A Wt:C2	879		RSD=8.5	
	101.7	107.4	98.9	92.2	118.8	103.1	94.5	99.2	89.6	94.6	Org:N Dep:R				
15 PFHxA	1.075983	1.029216	1.105682	0.986549	0.909301	0.963553	1.003636	0.950482	0.956436	0.947644	Avg:A Wt:C2	0.992848		RSD=6.2	
	108.4	103.7	111.4	99.4	91.6	97	101.1	95.7	96.3	95.4	Org:N Dep:R				
22 PFPeS	1.018454	1.085326	1.120417	1.006016	1.026902	0.969964	1.018303	1.012073	1.011076	0.948709	Avg:A Wt:C2	1.021724		RSD=4.9	
	99.7	106.2	109.7	98.5	100.5	94.9	99.7	99.1	99	92.9	Org:N Dep:R				
28 GenX	0.821112	0.766946	0.830246	0.775486	0.750769	0.754865	0.721808	0.818943	0.717033	0.768043	Avg:A Wt:C2	0.772525		RSD=5.2	
	106.3	99.3	107.5	100.4	97.2	97.7	93.4	106	92.8	99.4	Org:N Dep:R				
D 66 13C3_GenX	142	148	148	137	148	135	135	124	132	129	Avg:A Wt:C2	138		RSD=6.2	
	103.1	107.4	107.3	99.2	107.7	98.2	97.7	89.8	96.2	93.4	Org:N Dep:R				
13 PFHpA	0.945067	0.921340	0.907793	0.903954	0.831966	0.879228	0.970829	0.945151	0.867981	0.840308	Avg:A Wt:C2	0.901362		RSD=5.1	
	104.8	102.2	100.7	100.3	92.3	97.5	107.7	104.9	96.3	93.2	Org:N Dep:R				
D 47 13C4_PFHpA	850	936	929	860	943	907	793	835	836	834	Avg:A Wt:C2	872		RSD=6.0	
	97.5	107.3	106.5	98.6	108.2	104	90.9	95.7	95.9	95.6	Org:N Dep:R				
D 45 13C3_PFHxS	251	279	284	259	315	306	242	273	241	249	Avg:A Wt:C2	270		RSD=9.7	
	93	103.5	105.1	96.1	116.7	113.2	89.7	101.2	89.3	92.2	Org:N Dep:R				
14 PFHxS	1.119323	1.156345	1.118837	1.248978	0.954883	1.114222	1.220440	1.109225	1.154823	1.191182	Avg:A Wt:C2	1.138826		RSD=7.1	
	98.3	101.5	98.2	109.7	83.8	97.8	107.2	97.4	101.4	104.6	Org:N Dep:R				
29 ADONA	5.673058	5.883471	5.503880	5.437855	4.635137	4.958322	5.798550	4.943465	5.232954	5.321005	Avg:A Wt:C2	5.338770		RSD=7.6	
	106.3	110.2	103.1	101.9	86.8	92.9	108.6	92.6	98	99.7	Org:N Dep:R				
2 6:2 FTS	Disabled	1.487498	1.737395	1.559942	1.721429	1.458746	1.718619	1.574949	1.626254	1.600273	Avg:A Wt:C2	1.609456		RSD=6.3	
	Disabled	92.4	107.9	96.9	107	90.6	106.8	97.9	101	99.4	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	38.2768	44.4776	45.1838	40.1562	44.1990	43.2272	38.1654	39.8250	36.4944	39.9318	Avg:A Wt:C2	40.9937		RSD=7.4	
	93.4	108.5	110.2	98	107.8	105.4	93.1	97.1	89	97.4	Org:N Dep:R				
D 53 13C8_PFOA	827	882	965	771	935	864	794	725	690	744	Avg:A Wt:C2	820		RSD=11.1	
	100.9	107.6	117.7	94.1	114	105.4	96.9	88.4	84.2	90.7	Org:N Dep:R				
20 PFOA	1.038449	0.995902	0.996377	1.093731	0.926722	0.993258	1.011610	1.007736	0.981509	0.971591	Avg:A Wt:C2	1.001689		RSD=4.3	
	103.7	99.4	99.5	109.2	92.5	99.2	101	100.6	98	97	Org:N Dep:R				
12 PFHpS	1.164805	1.080471	1.081060	1.051052	0.890882	0.928102	1.078004	0.914911	0.977278	1.034953	Avg:A Wt:C2	1.020152		RSD=8.7	
	114.2	105.9	106	103	87.3	91	105.7	89.7	95.8	101.5	Org:N Dep:R				
D 54 13C8_PFOS	244	247	234	238	262	246	237	235	205	224	Avg:A Wt:C2	237		RSD=6.4	
	102.8	104	98.5	100.4	110.6	103.7	100	98.9	86.4	94.6	Org:N Dep:R				
18 PFOS	1.299710	1.164910	1.288202	1.073211	1.076193	1.178861	1.084632	1.112551	1.151442	1.221316	Avg:A Wt:C2	1.165103		RSD=7.1	
	111.6	100	110.6	92.1	92.4	101.2	93.1	95.5	98.8	104.8	Org:N Dep:R				
17 PFNA	0.911505	0.993820	0.915125	0.915148	0.849613	0.885453	0.902939	0.901454	0.873399	0.852101	Avg:A Wt:C2	0.900056		RSD=4.6	
	101.3	110.4	101.7	101.7	94.4	98.4	100.3	100.2	97	94.7	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 56 13C9_PFNA	854	843	921	782	932	857	795	782	753	840	Avg:A Wt:C2	836		RSD=7.1	
	102.2	100.9	110.2	93.6	111.5	102.5	95.1	93.5	90.1	100.5	Org:N Dep:R				
30 9Cl-PF3ONS	2.715089	2.842426	3.151001	2.779231	2.661623	3.026959	2.902914	2.929519	3.230840	3.139015	Avg:A Wt:C2	2.937862		RSD=6.6	
	92.4	96.8	107.3	94.6	90.6	103	98.8	99.7	110	106.8	Org:N Dep:R				
19 PFOSA	1.216329	1.176897	1.087619	1.074156	1.111177	1.059028	1.097737	1.045656	1.052369	1.065296	Avg:A Wt:C2	1.098626		RSD=5.1	
	110.7	107.1	99	97.8	101.1	96.4	99.9	95.2	95.8	97	Org:N Dep:R				
D 55 13C8_PFOSA	427	487	483	423	505	461	407	451	410	434	Avg:A Wt:C2	449		RSD=7.6	
	95.1	108.5	107.5	94.3	112.6	102.8	90.6	100.4	91.5	96.7	Org:N Dep:R				
16 PFNS	0.868721	0.937280	1.137838	0.981333	0.951999	0.944295	0.953852	0.966892	1.026388	0.965641	Avg:A Wt:C2	0.973424		RSD=7.2	
	89.2	96.3	116.9	100.8	97.8	97	98	99.3	105.4	99.2	Org:N Dep:R				
D 51 13C6_PFDA	764	821	837	731	871	783	701	757	699	708	Avg:A Wt:C2	767		RSD=7.9	
	99.6	107	109.1	95.3	113.6	102.1	91.4	98.7	91.1	92.3	Org:N Dep:R				
3 8:2 FTS	1.385833	2.108682	1.684758	1.588972	1.434739	1.588933	1.621682	1.805675	1.647974	1.539901	Avg:A Wt:C2	1.640715		RSD=12.4	
	84.5	128.5	102.7	96.8	87.4	96.8	98.8	110.1	100.4	93.9	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	41.4122	39.3294	38.4604	38.1610	43.9286	40.2198	34.3244	33.4198	31.3656	31.1872	Avg:A Wt:C2	37.1808		RSD=11.8	
	111.4	105.8	103.4	102.6	118.1	108.2	92.3	89.9	84.4	83.9	Org:N Dep:R				
10 PFDA	1.222792	0.998959	1.018531	1.000271	0.941521	0.980776	1.030134	0.922935	0.940200	0.938133	Avg:A Wt:C2	0.999425		RSD=8.7	
	122.3	100	101.9	100.1	94.2	98.1	103.1	92.3	94.1	93.9	Org:N Dep:R				
D 58 d3-MeFOSAA	193	204	202	183	221	201	185	173	188	203	Avg:A Wt:C2	195		RSD=7.0	
	99	104.2	103.2	93.5	113.4	102.8	94.9	88.7	96.3	104.1	Org:N Dep:R				
6 N-MeFOSAA	0.965207	0.864728	0.830652	0.727566	0.698156	0.819245	0.809288	0.890988	0.803596	0.761164	Avg:A Wt:C2	0.817059		RSD=9.6	
	118.1	105.8	101.7	89	85.4	100.3	99	109	98.4	93.2	Org:N Dep:R				
9 PFDS	0.826911	0.946596	0.921291	0.811832	0.854741	0.908420	0.877598	0.938744	1.005766	0.938307	Avg:A Wt:C2	0.903021		RSD=6.6	
	91.6	104.8	102	89.9	94.7	100.6	97.2	104	111.4	103.9	Org:N Dep:R				
D 60 d5-EtFOSAA	169	197	189	178	194	186	165	163	146	142	Avg:A Wt:C2	173		RSD=11.2	
	98	113.9	109.3	103.1	112.4	107.3	95.2	94.1	84.6	82	Org:N Dep:R				
D 52 13C7_PFUdA	745	825	805	758	786	725	649	692	644	663	Avg:A Wt:C2	729		RSD=9.0	
	102.2	113.2	110.4	103.9	107.8	99.4	89.1	94.9	88.3	90.9	Org:N Dep:R				
25 PFUdA	0.889673	0.936353	0.846776	0.908946	0.867449	0.977023	0.979867	0.937762	0.875216	0.873308	Avg:A Wt:C2	0.909237		RSD=5.1	
	97.8	103	93.1	100	95.4	107.5	107.8	103.1	96.3	96	Org:N Dep:R				
5 N-EtFOSAA	Disabled	0.879365	1.018478	0.886046	0.924758	0.922734	0.971371	0.959941	0.965690	1.039927	Avg:A Wt:C2	0.952034		RSD=5.8	
	Disabled	92.4	107	93.1	97.1	96.9	102	100.8	101.4	109.2	Org:N Dep:R				
D 61 d7-MeFOSE	112	120	135	119	137	125	108	127	115	133	Avg:A Wt:C2	123		RSD=8.1	
	91.4	97.2	109.6	96.5	111.2	102	87.5	103	93.3	108.4	Org:N Dep:R				
32 MeFOSE	1.142877	1.083110	1.053926	0.992502	0.973882	0.981942	1.058739	0.961884	0.986574	0.984289	Avg:A Wt:C2	1.021973		RSD=5.8	
	111.8	106	103.1	97.1	95.3	96.1	103.6	94.1	96.5	96.3	Org:N Dep:R				
26 MeFOSA	1.096511	1.252074	1.351117	1.153859	1.163779	1.024431	1.050626	0.969624	1.074546	0.982178	Avg:A Wt:C2	1.111875		RSD=10.9	
	98.6	112.6	121.5	103.8	104.7	92.1	94.5	87.2	96.6	88.3	Org:N Dep:R				
D 57 d3-MeFOSA	55.6310	65.0760	66.2230	59.7820	56.5700	69.1550	63.4730	66.1470	61.9150	72.3970	Avg:A Wt:C2	63.6369		RSD=8.4	
	87.4	102.3	104.1	93.9	88.9	108.7	99.7	103.9	97.3	113.8	Org:N Dep:R				
31 11Cl-PF3OUDS	2.416412	2.343736	2.630778	2.323093	2.171273	2.475857	2.368692	2.481449	2.692482	2.547382	Avg:A Wt:C2	2.445115		RSD=6.3	
	98.8	95.9	107.6	95	88.8	101.3	96.9	101.5	110.1	104.2	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 62 d9-EtFOSE	98.8980	116	110	107	120	112	99.3620	111	107	105	Avg:A Wt:C2	109		RSD=6.1	
	91.1	106.4	101	98.3	110.6	102.7	91.5	102.5	98.8	97.1	Org:N Dep:R				
33 EtFOSE	1.023479	0.714069	0.681669	0.807694	0.665465	0.730544	0.936610	0.788346	0.754219	0.803565	Avg:A Wt:C2	0.790566		RSD=14.3	
	129.5	90.3	86.2	102.2	84.2	92.4	118.5	99.7	95.4	101.6	Org:N Dep:R				
D 59 d5-EtFOSA	57.6400	59.8770	62.1870	57.3230	60.1470	59.6570	55.3810	63.4520	53.1040	58.8780	Avg:A Wt:C2	58.7646		RSD=5.2	
	98.1	101.9	105.8	97.5	102.4	101.5	94.2	108	90.4	100.2	Org:N Dep:R				
D 38 13C2_PFDoA	825	817	829	774	876	778	763	725	700	777	Avg:A Wt:C2	786		RSD=6.6	
	104.9	103.8	105.5	98.4	111.3	98.9	97	92.2	89.1	98.9	Org:N Dep:R				
27 EtFOSA	1.392783	1.250230	1.067908	1.236083	1.215522	1.291869	1.260898	1.085597	1.154118	1.139540	Avg:A Wt:C2	1.209455		RSD=8.2	
	115.2	103.4	88.3	102.2	100.5	106.8	104.3	89.8	95.4	94.2	Org:N Dep:R				
11 PFDoA	0.890988	1.043781	1.033752	0.946356	0.937151	1.027406	0.982624	1.007158	0.946795	0.859591	Avg:A Wt:C2	0.967560		RSD=6.4	
	92.1	107.9	106.8	97.8	96.9	106.2	101.6	104.1	97.9	88.8	Org:N Dep:R				
4 10:2 FTS	2.662234	2.693760	2.786721	2.745302	2.278240	2.599306	2.657322	2.588541	2.513367	2.558128	Avg:A Wt:C2	2.608292		RSD=5.5	
	102.1	103.3	106.8	105.3	87.3	99.7	101.9	99.2	96.4	98.1	Org:N Dep:R				
34 PFDOS	0.770702	0.786101	0.878000	0.763942	0.720703	0.803421	0.806278	0.820232	0.936460	0.922946	Avg:A Wt:C2	0.820878		RSD=8.6	
	93.9	95.8	107	93.1	87.8	97.9	98.2	99.9	114.1	112.4	Org:N Dep:R				
24 PFTrDA	0.429054	0.404707	0.399512	0.391201	0.395617	0.464613	0.451972	0.476353	0.495964	0.442508	Avg:A Wt:C2	0.435150		RSD=8.5	
	98.6	93	91.8	89.9	90.9	106.8	103.9	109.5	114	101.7	Org:N Dep:R				
D 42 13C2_PFTeDA	809	930	929	821	1004	936	857	918	887	902	Avg:A Wt:C2	899		RSD=6.5	
	90	103.4	103.3	91.3	111.6	104.1	95.3	102.1	98.6	100.3	Org:N Dep:R				
23 PFTeDA	1.047178	0.957068	0.905963	0.934204	0.858778	0.891532	0.954019	0.862990	0.838560	0.835369	Avg:A Wt:C2	0.908566		RSD=7.3	
	115.3	105.3	99.7	102.8	94.5	98.1	105	95	92.3	91.9	Org:N Dep:R				
35 PFHxDA	2.285254	2.241504	2.007746	2.082574	1.824050	1.990210	1.804223	1.945784	1.938052	1.831360	Avg:A Wt:C2	1.995076		RSD=8.4	
	114.5	112.4	100.6	104.4	91.4	99.8	90.4	97.5	97.1	91.8	Org:N Dep:R				
D 40 13C2_PFHxDA	292	309	323	285	348	327	306	316	286	320	Avg:A Wt:C2	311		RSD=6.5	
	93.8	99.2	103.8	91.5	112	105	98.2	101.7	91.8	102.9	Org:N Dep:R				
36 PFODA	1.402793	1.503515	1.469934	1.476383	1.254690	1.454301	1.399631	1.496303	1.551378	1.466192	Avg:A Wt:C2	1.447512		RSD=5.6	
	96.9	103.9	101.5	102	86.7	100.5	96.7	103.4	107.2	101.3	Org:N Dep:R				

Report Date: 09-Dec-2021 08:50:17 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 08-Dec-2021 16:22:41 Cal End Date: 08-Dec-2021 17:57:54
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	120821014.d	ICAL 50_SVLC-1740	08-Dec-2021 16:22:41
2	120821015.d	ICAL 100_SVLC-1741	08-Dec-2021 16:33:13
3	120821016.d	ICAL 200_SVLC-1742	08-Dec-2021 16:43:46
4	120821017.d	ICAL 500_SVLC-1743	08-Dec-2021 16:54:20
5	120821018.d	ICAL 1000_SVLC-1761	08-Dec-2021 17:04:53
6	120821019.d	ICAL 2000_SVLC-1745	08-Dec-2021 17:15:28
7	120821020.d	ICAL 5000_SVLC-1746	08-Dec-2021 17:26:02
8	120821021.d	ICAL 10000_SVLC-1747	08-Dec-2021 17:36:39
9	120821022.d	ICAL 15000_SVLC-1748	08-Dec-2021 17:47:15
10	120821023.d	ICAL 20000_SVLC-1749	08-Dec-2021 17:57:54

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	778625	789238	811382	750361	800013	820307	682597	741608	674817	704087	2.51
* 39 13C2_PFHxA	871480	931865	965671	827625	939741	909177	832712	873324	778240	846492	0.72
* 41 13C2_PFOA	817761	948193	924213	781817	866427	864167	762064	754590	677146	756691	1.93
* 43 13C3_PFBA	984443	1051780	1054292	949825	1024386	1037122	913808	934117	880868	941892	1.10
* 48 13C4_PFOS	253524	250930	269766	246075	242028	268912	242455	244234	220232	238563	1.52

13C2_PFDA ((|704087 - 778625| / (704087 + 778625)) / 2) * 100 = 2.51
13C2_PFHxA ((|846492 - 871480| / (846492 + 871480)) / 2) * 100 = 0.73
13C2_PFOA ((|756691 - 817761| / (756691 + 817761)) / 2) * 100 = 1.94
13C3_PFBA ((|941892 - 984443| / (941892 + 984443)) / 2) * 100 = 1.10
13C4_PFOS ((|238563 - 253524| / (238563 + 253524)) / 2) * 100 = 1.52

Report Date: 09-Dec-2021 08:50:17 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 08-Dec-2021 16:22:41 Cal End Date: 08-Dec-2021 17:57:54
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	120821014.d	ICAL 50_SVLC-1740	08-Dec-2021 16:22:41
2	120821015.d	ICAL 100_SVLC-1741	08-Dec-2021 16:33:13
3	120821016.d	ICAL 200_SVLC-1742	08-Dec-2021 16:43:46
4	120821017.d	ICAL 500_SVLC-1743	08-Dec-2021 16:54:20
5	120821018.d	ICAL 1000_SVLC-1761	08-Dec-2021 17:04:53
6	120821019.d	ICAL 2000_SVLC-1745	08-Dec-2021 17:15:28
7	120821020.d	ICAL 5000_SVLC-1746	08-Dec-2021 17:26:02
8	120821021.d	ICAL 10000_SVLC-1747	08-Dec-2021 17:36:39
9	120821022.d	ICAL 15000_SVLC-1748	08-Dec-2021 17:47:15
10	120821023.d	ICAL 20000_SVLC-1749	08-Dec-2021 17:57:54

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1062827	1159007	1148078	1002971	1177068	1096852	980111	1004505	936517	987695	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	58754	122862	245745	542120	1142637	2338887	5478021	10470707	14655389	19593913	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	941753	1007343	1035378	903059	996217	997692	928733	929057	870778	921157	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	51172	110652	227303	503491	1030343	2186449	5078041	9934150	13914403	19053728	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	328710	343367	338993	310522	348906	332474	311997	328109	293942	322414	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	21950	49309	86430	186004	379888	762885	1753969	3659229	5021916	7255803	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	234533	254614	263385	221050	280455	239128	243076	248355	221313	261469	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	4409	9355	18043	38398	94377	174750	391650	817653	1143179	1668254	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	894159	944272	869206	811112	1044461	906451	830486	872580	788218	831888	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	871480	931865	965671	827625	939741	909177	832712	873324	778240	846492	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	48105	97186	192213	400101	949729	1746827	4167529	8293714	11308196	15766673	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	15701	34956	71253	146511	336078	604987	1490048	3114818	4181573	5738252	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	11660	22694	49097	105991	222756	408268	971137	2024794	2849258	3953126	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	710013	739752	739194	683384	741759	676061	672711	618112	662280	643376	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	40186	86229	168611	388609	784848	1595284	3847313	7890038	10889023	14009107	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	850437	935909	928686	859798	943366	907207	792583	834791	836349	833570	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	251133	279319	283826	259368	315109	305667	242200	273239	241054	248842	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	12790	29392	57795	147395	273812	619857	1344937	2758061	3799816	5394773	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	67103	154805	294308	664301	1375860	2855382	6614766	12724042	17823928	24945845	
2 6:2 FTS	Disabled	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	Disabled	6272	14884	29692	72129	119557	310905	594608	843945	1211578	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	191384	222388	225919	200781	220995	216136	190827	199125	182472	199659	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	827176	882045	964555	771462	934678	864281	794356	725036	690371	743667	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	42949	87843	192212	421886	866187	1716908	4017894	7306450	10164077	14450809	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	817761	948193	924213	781817	866427	864167	762064	754590	677146	756691	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	13924	28731	58421	129762	267250	540146	1242801	2379900	3364035	4903557	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	243821	246680	233644	237946	262115	245874	237132	234554	204818	224394	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	253524	250930	269766	246075	242028	268912	242455	244234	220232	238563	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	14704	26667	55862	118490	261776	537964	1193412	2421647	3282837	5086477	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	38923	83801	168554	358030	792004	1517427	3587490	7045942	9864274	14322835	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	854038	843221	920934	782453	932194	856865	794625	781620	752941	840442	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	30849	65349	137230	308169	650211	1387283	3207822	6404055	9251044	13129570	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	25964	57313	104965	227394	561352	976767	2231369	4711515	6478134	9242147	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	426924	486984	482545	423391	505187	461162	406540	450580	410384	433783	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	10167	22196	51043	112082	239552	445781	1085706	2177169	3027206	4160333	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	763646	820674	836587	731048	871063	783251	700774	756839	698991	707825	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	2749	7945	12415	29045	60379	122445	266627	578108	742781	920163	
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	778625	789238	811382	750361	800013	820307	682597	741608	674817	704087	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	207061	196647	192302	190805	219643	201099	171622	167099	156828	155936	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	46689	81982	170418	365623	820124	1536388	3609456	6985129	9857873	13280683	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	966528	1017661	1007762	913072	1107074	1004089	926372	866776	940902	1016325	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	9329	17600	33484	66432	154582	329038	749702	1544574	2268315	3094359	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	9718	22510	41501	93109	215975	430632	1003074	2122595	2978746	4059415	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	847291	984802	944424	890800	971935	927846	823281	813682	731077	708433	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	745285	825319	804764	757664	786201	724758	649450	691933	644196	662758	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	33153	77279	136291	344338	681989	1416211	3181874	6488683	8457158	11575832	
5 N-EtFOSAA	Disabled	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	Disabled	17320	38475	78929	179761	342462	799711	1562173	2117981	2946874	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	112383	119600	134834	118706	136765	125403	107584	126625	114707	133297	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	6422	12954	28421	58908	133193	246277	569517	1217985	1697505	2624055	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	3050	8148	17895	34490	65835	141689	333432	641377	997958	1422135	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	55631	65076	66223	59782	56570	69155	63473	66147	61915	72397	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	27750	54462	115803	260355	536114	1146883	2645572	5482758	7792253	10769268	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	98898	115535	109628	106778	120116	111536	99362	111276	107284	105414	
33 EtFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	5061	8250	14946	43122	79933	162964	465317	877240	1213735	1694141	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	57640	59877	62187	57323	60147	59657	55381	63452	53104	58878	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	824837	816541	829425	773791	875501	777508	762851	725152	700367	777386	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	4014	7486	13282	35428	73110	154138	349149	688833	919324	1341877	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	36746	85229	171484	366141	820477	1597632	3747977	7303424	9946562	13364680	
4 10:2 FTS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	5314	10213	20664	50496	96477	201560	439637	833942	1139929	1538175	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	9095	18771	39715	87980	182862	382438	925381	1862322	2784992	4009524	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	17695	33046	66273	151354	346363	722481	1723935	3454280	5210355	6879987	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	809070	930206	929034	820632	1003760	936120	857271	917760	886697	902170	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	42362	89027	168334	383319	862007	1669162	4089262	7920181	11153223	15072901	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	33339	69193	129657	296443	635634	1300642	2757267	6155564	8304883	11724916	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	291775	308690	322892	284689	348474	326760	305646	316354	285678	320115	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	20465	46412	94926	210155	437227	950415	2138958	4733615	6647917	9387002	

Report Date: 09-Dec-2021 08:50:17 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 08-Dec-2021 16:22:41 Cal End Date: 08-Dec-2021 17:57:54

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	120821014.d	ICAL 50_SVLC-1740	08-Dec-2021 16:22:41
2	120821015.d	ICAL 100_SVLC-1741	08-Dec-2021 16:33:13
3	120821016.d	ICAL 200_SVLC-1742	08-Dec-2021 16:43:46
4	120821017.d	ICAL 500_SVLC-1743	08-Dec-2021 16:54:20
5	120821018.d	ICAL 1000_SVLC-1761	08-Dec-2021 17:04:53
6	120821019.d	ICAL 2000_SVLC-1745	08-Dec-2021 17:15:28
7	120821020.d	ICAL 5000_SVLC-1746	08-Dec-2021 17:26:02
8	120821021.d	ICAL 10000_SVLC-1747	08-Dec-2021 17:36:39
9	120821022.d	ICAL 15000_SVLC-1748	08-Dec-2021 17:47:15
10	120821023.d	ICAL 20000_SVLC-1749	08-Dec-2021 17:57:54

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.714	1.713	1.719	1.720	1.719	1.719	1.719	1.719	1.719	1.712	1.717	0.180
8 PFBA	1.720	1.719	1.719	1.720	1.719	1.719	1.719	1.719	1.719	1.719	1.719	0.049
D 50 13C5_PFPeA	2.087	2.084	2.095	2.098	2.095	2.095	2.095	2.095	2.084	2.084	2.091	0.259
21 PFPeA	2.087	2.095	2.095	2.098	2.095	2.095	2.095	2.095	2.084	2.084	2.092	0.235
D 44 13C3_PFBS	2.140	2.147	2.147	2.151	2.148	2.147	2.147	2.147	2.147	2.147	2.147	0.130
7 PFBS	2.140	2.147	2.147	2.151	2.148	2.147	2.147	2.147	2.147	2.147	2.147	0.130
D 63 13C2_4:2 FTS_2	2.425	2.431	2.431	2.434	2.432	2.431	2.431	2.431	2.431	2.422	2.430	0.145
1 4:2 FTS	2.425	2.431	2.431	2.434	2.440	2.431	2.431	2.431	2.431	2.422	2.431	0.197
D 49 13C5_PFHxA	2.470	2.467	2.475	2.479	2.476	2.475	2.475	2.466	2.466	2.466	2.471	0.199
* 39 13C2_PFHxA	2.470	2.475	2.475	2.479	2.476	2.475	2.475	2.466	2.466	2.466	2.472	0.190
15 PFHxA	2.470	2.467	2.475	2.470	2.476	2.475	2.475	2.466	2.466	2.466	2.470	0.174
22 PFPeS	2.505	2.502	2.511	2.514	2.511	2.511	2.502	2.502	2.502	2.502	2.505	0.202
28 GenX	2.593	2.590	2.590	2.601	2.599	2.598	2.598	2.598	2.590	2.590	2.595	0.170
D 66 13C3_GenX	2.585	2.590	2.598	2.601	2.599	2.598	2.598	2.598	2.590	2.590	2.595	0.213
13 PFHpA	2.863	2.861	2.869	2.872	2.870	2.869	2.869	2.860	2.860	2.860	2.865	0.171
D 47 13C4_PFHpA	2.863	2.861	2.869	2.872	2.870	2.869	2.869	2.869	2.860	2.860	2.866	0.164
D 45 13C3_PFHxS	2.872	2.878	2.878	2.881	2.888	2.878	2.878	2.878	2.878	2.878	2.879	0.128
14 PFHxS	2.872	2.878	2.887	2.881	2.888	2.887	2.878	2.878	2.878	2.878	2.880	0.176
29 ADONA	2.908	2.905	2.914	2.908	2.914	2.914	2.905	2.905	2.905	2.905	2.907	0.147
2 6:2 FTS	Disabled	3.233	3.239	3.247	3.240	3.239	3.239	3.233	3.233	3.233	3.237	0.153
D 64 13C2_6:2 FTS_2	3.234	3.233	3.239	3.240	3.240	3.239	3.239	3.233	3.233	3.233	3.236	0.115
D 53 13C8_PFOA	3.253	3.258	3.265	3.266	3.265	3.265	3.265	3.265	3.265	3.258	3.262	0.133
20 PFOA	3.259	3.265	3.265	3.266	3.271	3.265	3.265	3.265	3.265	3.258	3.264	0.107
* 41 13C2_PFOA	3.259	3.258	3.265	3.266	3.271	3.265	3.265	3.258	3.258	3.264	3.263	0.129
12 PFHpS	3.259	3.265	3.271	3.272	3.271	3.271	3.271	3.271	3.271	3.264	3.268	0.130
D 54 13C8_PFOS	3.631	3.630	3.638	3.646	3.638	3.643	3.636	3.635	3.635	3.635	3.636	0.138
* 48 13C4_PFOS	3.631	3.637	3.638	3.639	3.638	3.643	3.643	3.635	3.635	3.635	3.637	0.097
18 PFOS	3.631	3.637	3.638	3.646	3.638	3.643	3.643	3.635	3.635	3.635	3.638	0.126
17 PFNA	3.631	3.645	3.645	3.646	3.645	3.650	3.643	3.643	3.643	3.643	3.643	0.142
D 56 13C9_PFNA	3.638	3.637	3.645	3.654	3.645	3.643	3.643	3.643	3.643	3.643	3.643	0.121
30 9Cl-PF3ONS	3.833	3.838	3.845	3.841	3.845	3.838	3.843	3.844	3.844	3.838	3.840	0.105
19 PFOSA	3.941	3.939	3.940	3.949	3.947	3.946	3.945	3.939	3.939	3.939	3.942	0.110

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 55 13C8_PFOSA	3.933	3.939	3.940	3.949	3.947	3.946	3.945	3.939	3.939	3.939	3.941	0.131
16 PFNS	3.978	3.969	3.977	3.980	3.977	3.976	3.975	3.976	3.969	3.976	3.975	0.092
D 51 13C6_PFDA	3.978	3.985	3.985	3.995	3.985	3.984	3.990	3.984	3.984	3.984	3.985	0.110
3 8:2 FTS	3.971	3.977	3.985	3.987	3.985	3.984	3.983	3.976	3.976	3.984	3.980	0.133
* 37 13C2_PFDA	3.978	3.985	3.985	3.987	3.985	3.984	3.990	3.984	3.984	3.984	3.984	0.077
D 65 13C2_8:2 FTS_2	3.971	3.977	3.977	3.987	3.985	3.976	3.983	3.976	3.976	3.976	3.978	0.124
10 PFDA	3.978	3.985	3.985	3.987	3.992	3.984	3.983	3.984	3.984	3.991	3.985	0.106
D 58 d3-MeFOSAA	4.128	4.134	4.143	4.146	4.143	4.142	4.142	4.134	4.134	4.134	4.138	0.139
6 N-MeFOSAA	4.128	4.142	4.143	4.154	4.143	4.142	4.142	4.142	4.142	4.142	4.142	0.149
9 PFDS	4.268	4.267	4.276	4.280	4.277	4.276	4.276	4.267	4.267	4.267	4.271	0.128
D 60 d5-EtFOSAA	4.287	4.285	4.295	4.299	4.295	4.294	4.294	4.285	4.294	4.294	4.292	0.108
D 52 13C7_PFUdA	4.287	4.285	4.295	4.289	4.295	4.294	4.294	4.285	4.285	4.285	4.289	0.102
25 PFUdA	4.287	4.285	4.295	4.299	4.295	4.294	4.294	4.285	4.285	4.285	4.290	0.121
5 N-EtFOSAA	Disabled	4.294	4.304	4.299	4.304	4.304	4.304	4.294	4.294	4.294	4.299	0.108
D 61 d7-MeFOSE	4.359	4.358	4.367	4.362	4.367	4.358	4.358	4.358	4.358	4.358	4.360	0.096
32 MeFOSE	4.368	4.367	4.376	4.380	4.376	4.376	4.376	4.367	4.367	4.367	4.372	0.123
26 MeFOSA	4.386	4.376	4.385	4.389	4.385	4.385	4.385	4.385	4.376	4.385	4.383	0.099
D 57 d3-MeFOSA	4.377	4.376	4.385	4.380	4.385	4.376	4.376	4.376	4.376	4.376	4.378	0.094
31 11Cl-PF3OUDS	4.422	4.421	4.421	4.425	4.431	4.421	4.421	4.421	4.421	4.421	4.422	0.072
D 62 d9-EtFOSE	4.519	4.525	4.526	4.521	4.526	4.525	4.525	4.518	4.517	4.517	4.521	0.086
33 EtFOSE	4.534	4.533	4.541	4.536	4.534	4.533	4.533	4.526	4.533	4.533	4.533	0.086
D 59 d5-EtFOSA	4.534	4.541	4.549	4.544	4.549	4.541	4.541	4.541	4.541	4.541	4.542	0.100
D 38 13C2_PFDoA	4.542	4.549	4.557	4.552	4.557	4.557	4.556	4.549	4.549	4.549	4.551	0.109
27 EtFOSA	4.542	4.549	4.549	4.552	4.557	4.549	4.549	4.541	4.541	4.541	4.546	0.122
11 PFDoA	4.550	4.549	4.557	4.560	4.557	4.557	4.556	4.549	4.556	4.549	4.554	0.093
4 10:2 FTS	4.558	4.557	4.565	4.567	4.565	4.572	4.564	4.565	4.564	4.564	4.564	0.099
34 PFDOS	4.757	4.756	4.762	4.758	4.762	4.762	4.762	4.756	4.756	4.756	4.758	0.067
24 PFTrDA	4.774	4.779	4.791	4.782	4.791	4.791	4.785	4.786	4.785	4.785	4.784	0.114
D 42 13C2_PFTeDA	4.991	4.990	4.999	4.992	4.999	4.998	4.998	4.991	4.990	4.990	4.994	0.079
23 PFTeDA	4.991	4.990	4.999	5.000	4.999	4.998	4.998	4.991	4.998	4.990	4.995	0.085
35 PFHxDA	5.365	5.364	5.373	5.373	5.373	5.372	5.372	5.373	5.372	5.372	5.371	0.064
D 40 13C2_PFHxDA	5.365	5.364	5.364	5.373	5.373	5.372	5.372	5.365	5.364	5.364	5.367	0.083
36 PFODA	5.721	5.727	5.727	5.728	5.728	5.727	5.727	5.728	5.727	5.727	5.726	0.033

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b\120821025.d
Injection Date: 08-Dec-2021 18:19:15 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 11
Sample Info: ICV 500_SVLC-1765 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			500.00	475.03	95	70 - 130
D 46 13C4_PFBA	1177068	1201711			102.1	50 - 150
21 PFPeA			500.00	474.61	94.9	70 - 130
D 50 13C5_PFPeA	996217	1103961			110.8	50 - 150
7 PFBS			442.50	408.47	92.3	70 - 130
D 44 13C3_PFBS	348906	367691			105.4	50 - 150
D 63 13C2_4:2 FTS_2	280455	274712			98	50 - 150
1 4:2 FTS			467.50	417.46	89.3	70 - 130
D 49 13C5_PFHxA	1044461	975210			93.4	50 - 150
15 PFHxA			500.00	466.84	93.4	70 - 130
22 PFPeS			470.00	442.31	94.1	70 - 130
28 GenX			2500.00	2388.39	95.5	70 - 130
D 66 13C3_GenX	741759	799107			107.7	50 - 150
D 47 13C4_PFHpA	943366	955956			101.3	50 - 150
13 PFHpA			500.00	458.80	91.8	70 - 130
14 PFHxS			456.00	412.64	90.5	70 - 130
D 45 13C3_PFHxS	315109	313958			99.6	50 - 150
29 ADONA			2355.00	2266.43	96.2	70 - 130
2 6:2 FTS			475.00	441.64	93	70 - 130
D 64 13C2_6:2 FTS_2	220995	229201			103.7	50 - 150
D 53 13C8_PFOA	934678	944796			101.1	50 - 150
12 PFHpS			475.00	432.86	91.1	70 - 130
20 PFOA			500.00	491.67	98.3	70 - 130
D 54 13C8_PFOS	262115	287144			109.5	50 - 150
18 PFOS			462.75	410.88	88.8	70 - 130
17 PFNA			500.00	482.20	96.4	70 - 130
D 56 13C9_PFNA	932194	931096			99.9	50 - 150
30 9Cl-PF3ONS			2330.00	2087.67	89.6	70 - 130
19 PFOSA			500.00	459.90	92	70 - 130
D 55 13C8_PFOSA	505187	532566			105.4	50 - 150
16 PFNS			480.00	424.80	88.5	70 - 130
3 8:2 FTS			480.00	446.70	93.1	70 - 130
D 51 13C6_PFDA	871063	901120			103.5	50 - 150
D 65 13C2_8:2 FTS_2	219643	234544			106.8	50 - 150
10 PFDA			500.00	490.59	98.1	70 - 130
6 N-MeFOSAA			500.00	548.38	109.7	70 - 130

Report Date: 09-Dec-2021 08:50:14 AIM Revision: 2.0.2021.1020
Data File: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b\120821025.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1107074	1202037			108.6	50 - 150
9 PFDS			482.50	461.34	95.6	70 - 130
25 PFUdA			500.00	470.13	94	70 - 130
D 52 13C7_PFUdA	786201	865535			110.1	50 - 150
D 60 d5-EtFOSAA	971935	1021127			105.1	50 - 150
5 N-EtFOSAA			500.00	532.59	106.5	70 - 130
D 61 d7-MeFOSE	136765	136892			100.1	50 - 150
D 57 d3-MeFOSA	56570	63002			111.4	50 - 150
31 11Cl-PF3OUDS			2355.00	1945.67	82.6	70 - 130
D 62 d9-EtFOSE	120116	129908			108.2	50 - 150
D 59 d5-EtFOSA	60147	66366			110.3	50 - 150
D 38 13C2_PFDoA	875501	920101			105.1	50 - 150
11 PFDoA			500.00	456.47	91.3	70 - 130
4 10:2 FTS			2410.00	2205.98	91.5	70 - 130
24 PFTrDA			500.00	451.88	90.4	70 - 130
D 42 13C2_PFTeDA	1003760	959611			95.6	50 - 150
23 PFTeDA			500.00	475.42	95.1	70 - 130
D 40 13C2_PFHxDA	348474	364966			104.7	50 - 150

Report Date: 14-Dec-2021 14:13:11 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Initial Calibration Signal Ratios Report

Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 11-Dec-2021 12:00:51 Cal End Date: 11-Dec-2021 13:36:15
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	121121012.d	ICAL 50_SVLC-1740	11-Dec-2021 12:00:51
2	121121013.d	ICAL 100_SVLC-1741	11-Dec-2021 12:11:24
3	121121014.d	ICAL 200_SVLC-1742	11-Dec-2021 12:22:00
4	121121015.d	ICAL 500_SVLC-1743	11-Dec-2021 12:32:35
5	121121016.d	ICAL 1000_SVLC-1761	11-Dec-2021 12:43:12
6	121121017.d	ICAL 2000_SVLC-1745	11-Dec-2021 12:53:46
7	121121018.d	ICAL 5000_SVLC-1746	11-Dec-2021 13:04:23
8	121121019.d	ICAL 10000_SVLC-1747	11-Dec-2021 13:15:00
9	121121020.d	ICAL 15000_SVLC-1748	11-Dec-2021 13:25:36
10	121121021.d	ICAL 20000_SVLC-1749	11-Dec-2021 13:36:15

Column: 1 Detector: LCMS-Q3

Compound	Ratio Level 1	Ratio Level 2	Ratio Level 3	Ratio Level 4	Ratio Level 5	Ratio Level 6	Ratio Level 7	Ratio Level 8	Ratio Level 9	Ratio Level 10	Average Ratio	Avg. +/-3 SD Ratio Limits	StdD Limit	50% Limit
7 PFBS	3.738	3.347	3.830	3.785	3.978	3.759	3.704	3.609	3.865	3.743	3.735	3.254-4.216	0.16036	1.867
1 4:2 FTS	1.211	1.650	1.230	1.627	1.488	1.609	1.747	1.607	1.611	1.544	1.532	0.918-2.146	0.20466	0.766
15 PFHxA	16.230	16.837	21.730	18.194	17.677	16.690	16.235	16.383	17.215	19.451	17.664	12.498-22.830	1.72203	8.832
22 PFPeS	3.861	3.140	3.051	3.065	3.250	3.305	3.663	3.348	3.360	3.357	3.340	2.602-4.077	0.24570	1.670
28 GenX	0.972	0.773	0.779	0.823	0.835	0.803	0.783	0.749	0.706	0.810	0.803	0.603-1.003	0.06668	0.401
13 PFHpA	2.787	3.081	3.006	3.131	3.139	3.104	2.858	3.124	2.950	2.903	3.008	2.630-3.386	0.12605	1.504
14 PFHxS	3.141	3.375	3.384	3.588	3.455	3.536	3.480	3.521	3.367	3.478	3.432	3.040-3.824	0.13078	1.716
29 ADONA	2.203	2.321	2.285	2.359	2.461	2.456	2.371	2.282	2.291	2.237	2.326	2.050-2.602	0.09209	1.163
2 6:2 FTS	1.131	1.194	1.176	1.256	1.337	1.320	1.313	1.337	1.247	1.285	1.259	0.989-1.529	0.08996	0.629
20 PFOA	2.281	2.504	2.677	2.458	2.529	2.581	2.568	2.379	2.525	2.492	2.499	2.168-2.829	0.11019	1.249
12 PFHpS	3.158	3.195	3.623	3.796	3.619	3.735	3.685	3.709	3.938	3.636	3.609	2.883-4.334	0.24182	1.804
18 PFOS	4.357	3.592	4.569	3.921	4.262	3.436	3.892	3.745	4.091	4.078	3.994	2.927-5.061	0.35574	1.997
17 PFNA	4.500	4.326	4.439	4.601	4.574	4.568	4.661	4.672	4.651	4.451	4.544	4.195-4.892	0.11615	2.272
19 PFOSA	34.632	31.228	47.372	46.271	36.417	40.022	40.547	45.552	42.389	44.216	40.864	25.084-56.644	5.26001	20.432
16 PFNS	4.697	3.443	2.795	3.282	3.856	3.728	3.785	3.624	3.601	3.745	3.655	2.213-5.098	0.48085	1.827
3 8:2 FTS	2.094	1.388	1.579	1.348	1.468	1.422	1.435	1.390	1.513	1.554	1.519	0.853-2.184	0.22186	0.759
10 PFDA	7.439	8.798	8.572	9.044	9.652	9.349	10.578	9.597	9.697	10.408	9.313	6.560-12.066	0.91757	4.656
6 N-MeFOSAA	1.943	1.390	1.395	1.378	1.454	1.437	1.382	1.486	1.659	1.467	1.499	0.959-2.038	0.17996	0.749
9 PFDS	4.059	3.431	3.519	3.959	3.916	3.644	3.627	3.579	3.626	3.847	3.720	2.933-4.507	0.26239	1.860
25 PFUdA	8.487	9.704	10.168	9.159	9.370	10.019	10.021	9.136	9.131	9.432	9.462	7.872-11.053	0.53014	4.731
5 N-EtFOSAA	1.449	1.664	1.449	1.630	1.656	1.675	1.521	1.771	1.676	1.674	1.616	1.204-2.028	0.13734	0.808
26 MeFOSA	1.004	0.975	1.031	1.061	1.110	0.972	1.074	1.072	1.040	1.086	1.042	0.899-1.185	0.04758	0.521
27 EtFOSA	0.839	1.058	0.894	0.990	0.942	1.042	1.039	1.094	1.065	1.053	1.001	0.721-1.281	0.09330	0.500
11 PFDoA	7.498	5.878	7.119	6.631	7.085	7.122	6.314	7.057	7.430	7.397	6.953	5.371-8.534	0.52729	3.476
4 10:2 FTS	Disabled	2.495	3.036	2.443	2.509	2.426	2.472	2.429	2.441	2.548	2.533	1.914-3.151	0.20615	1.266
34 PFDOS	3.791	4.074	3.574	4.020	3.628	3.649	3.596	3.698	3.725	3.695	3.745	3.207-4.282	0.17926	1.872
24 PFTrDA	2.606	2.565	2.641	2.569	2.513	2.945	2.904	2.959	2.977	2.975	2.765	2.141-3.389	0.20801	1.382
23 PFTeDA	6.841	7.216	7.875	8.197	7.176	7.551	7.598	7.177	7.474	7.406	7.451	6.329-8.572	0.37384	3.725
35 PFHxDA	13.786	13.958	12.741	12.858	13.417	12.007	12.784	12.632	12.678	11.946	12.880	10.837-14.924	0.68122	6.440
36 PFODA	144.347	190.826	106.659	126.723	151.816	143.623	133.956	143.779	147.961	154.249	144.393	79.833-208.954	21.52023	72.196

Report Date: 14-Dec-2021 14:13:11 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Initial Calibration RF Report

Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 11-Dec-2021 12:00:51 Cal End Date: 11-Dec-2021 13:36:15

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	121121012.d	ICAL 50_SVLC-1740	11-Dec-2021 12:00:51
2	121121013.d	ICAL 100_SVLC-1741	11-Dec-2021 12:11:24
3	121121014.d	ICAL 200_SVLC-1742	11-Dec-2021 12:22:00
4	121121015.d	ICAL 500_SVLC-1743	11-Dec-2021 12:32:35
5	121121016.d	ICAL 1000_SVLC-1761	11-Dec-2021 12:43:12
6	121121017.d	ICAL 2000_SVLC-1745	11-Dec-2021 12:53:46
7	121121018.d	ICAL 5000_SVLC-1746	11-Dec-2021 13:04:23
8	121121019.d	ICAL 10000_SVLC-1747	11-Dec-2021 13:15:00
9	121121020.d	ICAL 15000_SVLC-1748	11-Dec-2021 13:25:36
10	121121021.d	ICAL 20000_SVLC-1749	11-Dec-2021 13:36:15

Curve Legend: Ex. Avg:H Wt:C2 Org:F Dep:R

Curve Type: Avg, Ln, Qd Response Type: H-Height, A-Area

Wt: Curve Weighting, C-1/Conc, C2-1/Conc^2, R-1/Rsp, R2-1/Rsp^2, N-None

Org: Origin, F-Force, I-Include, N-Neither

Dep: Dependent Variable, C-Concentration, R-Response

%Rec = (Measured Amount / True Amount) * 100

Column: 1 Detector: LCMS-Q3

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 46 13C4_PFBA	1193	1317	1274	1182	1371	1266	1157	1143	1089	1092	Avg:A Wt:C2	1208		RSD=7.9	
	98.7	109	105.5	97.8	113.4	104.8	95.7	94.6	90.1	90.3	Org:N Dep:R				
8 PFBA	1.153038	1.126028	1.127304	1.094701	1.045566	1.057639	1.088531	1.024833	1.009946	0.973828	Avg:A Wt:C2	1.070141		RSD=5.4	
	107.7	105.2	105.3	102.3	97.7	98.8	101.7	95.8	94.4	91	Org:N Dep:R				
D 50 13C5_PFPeA	1050	1159	1139	1021	1196	1084	966	997	966	991	Avg:A Wt:C2	1057		RSD=7.9	
	99.4	109.6	107.7	96.6	113.2	102.6	91.4	94.3	91.4	93.8	Org:N Dep:R				
21 PFPeA	1.159683	1.049387	1.074566	1.105101	0.961660	1.078908	1.175354	1.067423	1.037309	1.006338	Avg:A Wt:C2	1.071573		RSD=6.0	
	108.2	97.9	100.3	103.1	89.7	100.7	109.7	99.6	96.8	93.9	Org:N Dep:R				
D 44 13C3_PFBS	336	370	364	357	398	370	341	329	328	330	Avg:A Wt:C2	352		RSD=6.6	
	95.4	105.1	103.4	101.4	112.8	105.1	96.7	93.4	93.1	93.7	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
7 PFBS	1.698031	1.545080	1.516044	1.311967	1.317485	1.311159	1.334199	1.270297	1.240042	1.280053	Avg:A Wt:C2	1.382436		RSD=10.9	
	122.8	111.8	109.7	94.9	95.3	94.8	96.5	91.9	89.7	92.6	Org:N Dep:R				
1 4:2 FTS	2.114866	1.851053	1.794735	1.874808	1.939870	1.839627	1.859496	1.785256	1.883407	1.755520	Avg:A Wt:C2	1.869864		RSD=5.4	
	113.1	99	96	100.3	103.7	98.4	99.4	95.5	100.7	93.9	Org:N Dep:R				
D 63 13C2_4:2 FTS_2	65.0944	77.5240	78.1700	70.0326	69.6188	75.1994	70.0108	66.4728	63.0312	65.2528	Avg:A Wt:C2	70.0407		RSD=7.6	
	92.9	110.7	111.6	100	99.4	107.4	100	94.9	90	93.2	Org:N Dep:R				
D 49 13C5_PFHxA	956	979	996	934	1079	995	971	907	850	878	Avg:A Wt:C2	954		RSD=6.9	
	100.2	102.5	104.3	97.8	113.1	104.3	101.7	95	89.1	91.9	Org:N Dep:R				
15 PFHxA	1.156167	1.152797	1.131706	1.010494	0.971584	0.949649	0.970191	0.981865	0.969208	0.975650	Avg:A Wt:C2	1.026931		RSD=8.2	
	112.6	112.3	110.2	98.4	94.6	92.5	94.5	95.6	94.4	95	Org:N Dep:R				
22 PFPeS	1.110196	0.970216	1.046340	0.900575	0.982692	1.007329	1.023878	1.025734	0.998767	0.994857	Avg:A Wt:C2	1.006058		RSD=5.4	
	110.4	96.4	104	89.5	97.7	100.1	101.8	102	99.3	98.9	Org:N Dep:R				
28 GenX	0.845734	0.720072	0.760996	0.795270	0.773628	0.759985	0.742913	0.726647	0.715604	0.811610	Avg:A Wt:C2	0.765246		RSD=5.5	
	110.5	94.1	99.4	103.9	101.1	99.3	97.1	95	93.5	106.1	Org:N Dep:R				
D 66 13C3_GenX	132	146	140	128	142	138	125	115	118	111	Avg:A Wt:C2	129		RSD=9.4	
	101.8	112.6	108.2	98.6	110.1	106.6	96.7	88.8	91.2	85.4	Org:N Dep:R				
D 47 13C4_PFHpA	975	968	956	904	1101	995	924	831	782	806	Avg:A Wt:C2	924		RSD=10.5	
	105.5	104.7	103.5	97.8	119.2	107.6	100	89.9	84.6	87.2	Org:N Dep:R				
13 PFHpA	0.921847	1.025470	0.914767	0.893534	0.861917	0.895108	0.886072	0.957022	0.935203	0.904809	Avg:A Wt:C2	0.919575		RSD=5.0	
	100.2	111.5	99.5	97.2	93.7	97.3	96.4	104.1	101.7	98.4	Org:N Dep:R				
D 45 13C3_PFHxS	290	306	316	291	345	297	275	271	269	260	Avg:A Wt:C2	292		RSD=8.7	
	99.2	104.8	108.2	99.6	118	101.7	94.3	92.9	92.2	89.1	Org:N Dep:R				
14 PFHxS	1.269728	1.112489	1.109183	1.125440	1.073742	1.175115	1.191066	1.159210	1.109743	1.174827	Avg:A Wt:C2	1.150054		RSD=4.9	
	110.4	96.7	96.4	97.9	93.4	102.2	103.6	100.8	96.5	102.2	Org:N Dep:R				
29 ADONA	5.760181	5.874890	5.447871	5.385030	5.164068	5.754859	5.814380	5.452225	5.233270	5.278047	Avg:A Wt:C2	5.516482		RSD=4.8	
	104.4	106.5	98.8	97.6	93.6	104.3	105.4	98.8	94.9	95.7	Org:N Dep:R				
2 6:2 FTS	1.624763	1.809230	1.465586	1.477625	1.812481	1.621900	1.615475	1.653227	1.647760	1.496160	Avg:A Wt:C2	1.622421		RSD=7.5	
	100.1	111.5	90.3	91.1	111.7	100	99.6	101.9	101.6	92.2	Org:N Dep:R				
D 64 13C2_6:2 FTS_2	67.3386	72.8916	74.7638	71.2984	80.5328	68.7202	66.3664	55.4560	54.9070	56.9152	Avg:A Wt:C2	66.9190		RSD=13.0	
	100.6	108.9	111.7	106.5	120.3	102.7	99.2	82.9	82	85.1	Org:N Dep:R				
D 53 13C8_PFOA	917	973	963	908	1018	927	887	785	722	730	Avg:A Wt:C2	883		RSD=11.7	
	103.9	110.2	109	102.8	115.3	105	100.4	88.9	81.7	82.7	Org:N Dep:R				
20 PFOA	0.921363	1.047762	1.073766	0.981919	0.961388	1.024182	1.001762	1.006925	1.030093	1.009652	Avg:A Wt:C2	1.005881		RSD=4.3	
	91.6	104.2	106.7	97.6	95.6	101.8	99.6	100.1	102.4	100.4	Org:N Dep:R				
12 PFHpS	0.917188	1.090552	0.993196	1.046423	0.953276	1.064269	1.126401	1.010676	1.009501	1.026272	Avg:A Wt:C2	1.023775		RSD=6.1	
	89.6	106.5	97	102.2	93.1	104	110	98.7	98.6	100.2	Org:N Dep:R				
D 54 13C8_PFOS	259	266	271	270	316	266	257	249	232	250	Avg:A Wt:C2	264		RSD=8.3	
	98.3	100.9	102.8	102.5	119.8	100.8	97.6	94.5	88.1	94.8	Org:N Dep:R				
18 PFOS	1.417554	1.222662	1.221286	1.094893	1.032581	1.170522	1.107807	1.113789	1.159894	1.108044	Avg:A Wt:C2	1.164903		RSD=9.1	
	121.7	105	104.8	94	88.6	100.5	95.1	95.6	99.6	95.1	Org:N Dep:R				
D 56 13C9_PFNA	904	945	916	923	1015	918	863	848	764	858	Avg:A Wt:C2	895		RSD=7.5	
	101	105.5	102.3	103.1	113.3	102.6	96.4	94.7	85.3	95.8	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
17 PFNA	0.894250	0.868593	0.853556	0.865099	0.806385	0.855700	0.881994	0.864177	0.885417	0.788847	Avg:A Wt:C2	0.856402		RSD=3.9	
	104.4	101.4	99.7	101	94.2	99.9	103	100.9	103.4	92.1	Org:N Dep:R				
30 9Cl-PF3ONS	3.110531	3.384310	3.127875	2.889916	2.587903	2.983116	2.927399	3.006082	3.074884	3.002521	Avg:A Wt:C2	3.009454		RSD=6.7	
	103.4	112.5	103.9	96	86	99.1	97.3	99.9	102.2	99.8	Org:N Dep:R				
D 55 13C8_PFOSA	531	527	505	474	591	523	500	517	464	469	Avg:A Wt:C2	510		RSD=7.3	
	104	103.3	99.1	92.9	115.8	102.6	98	101.3	91	92	Org:N Dep:R				
19 PFOSA	0.926803	1.094600	1.165007	1.154187	0.958796	1.012668	1.026430	1.003288	1.054996	1.067607	Avg:A Wt:C2	1.046438		RSD=7.4	
	88.6	104.6	111.3	110.3	91.6	96.8	98.1	95.9	100.8	102	Org:N Dep:R				
16 PFNS	1.042088	1.060834	0.977033	0.940581	0.924395	1.063265	0.991612	0.991513	1.000598	0.939687	Avg:A Wt:C2	0.993161		RSD=5.0	
	104.9	106.8	98.4	94.7	93.1	107.1	99.8	99.8	100.7	94.6	Org:N Dep:R				
D 51 13C6_PFDA	826	851	882	836	914	844	809	731	692	692	Avg:A Wt:C2	808		RSD=9.6	
	102.3	105.4	109.2	103.5	113.1	104.5	100.2	90.5	85.7	85.6	Org:N Dep:R				
3 8:2 FTS	2.166538	1.623115	1.741104	1.739773	1.510603	1.624628	1.715740	1.729224	1.701751	1.646603	Avg:A Wt:C2	1.719908		RSD=10.0	
	126	94.4	101.2	101.2	87.8	94.5	99.8	100.5	98.9	95.7	Org:N Dep:R				
D 65 13C2_8:2 FTS_2	53.2198	59.3526	58.2322	55.6836	66.2008	59.4040	50.6464	43.5170	41.8618	41.0980	Avg:A Wt:C2	52.9216		RSD=16.1	
	100.6	112.2	110	105.2	125.1	112.2	95.7	82.2	79.1	77.7	Org:N Dep:R				
10 PFDA	0.990013	1.017294	1.095037	1.057742	0.989722	0.977738	1.032175	1.035408	1.004803	1.042913	Avg:A Wt:C2	1.024284		RSD=3.5	
	96.7	99.3	106.9	103.3	96.6	95.5	100.8	101.1	98.1	101.8	Org:N Dep:R				
D 58 d3-MeFOSAA	223	253	243	225	272	245	234	227	229	234	Avg:A Wt:C2	239		RSD=6.3	
	93.7	106.1	102	94.4	113.9	102.6	98.2	95.2	95.8	98.1	Org:N Dep:R				
6 N-MeFOSAA	1.023221	0.862792	0.834432	0.853998	0.742442	0.822496	0.784279	0.834776	0.866065	0.816321	Avg:A Wt:C2	0.844082		RSD=8.7	
	121.2	102.2	98.9	101.2	88	97.4	92.9	98.9	102.6	96.7	Org:N Dep:R				
9 PFDS	1.139061	0.951460	0.891705	0.943433	0.821171	0.931294	0.904743	0.898183	0.904914	0.892746	Avg:A Wt:C2	0.927871		RSD=8.9	
	122.8	102.5	96.1	101.7	88.5	100.4	97.5	96.8	97.5	96.2	Org:N Dep:R				
D 60 d5-EtFOSAA	227	231	216	208	239	214	189	204	158	172	Avg:A Wt:C2	206		RSD=12.7	
	110.4	112.4	104.8	100.9	116.4	103.9	91.8	99.1	76.8	83.6	Org:N Dep:R				
D 52 13C7_PFUdA	752	781	770	778	903	779	723	624	651	625	Avg:A Wt:C2	739		RSD=11.7	
	101.8	105.7	104.2	105.3	122.3	105.5	97.9	84.5	88.1	84.7	Org:N Dep:R				
25 PFUdA	1.001971	0.914006	0.957452	0.947782	0.843479	0.906663	0.915796	0.913685	0.817220	0.858733	Avg:A Wt:C2	0.907679		RSD=6.1	
	110.4	100.7	105.5	104.4	92.9	99.9	100.9	100.7	90	94.6	Org:N Dep:R				
5 N-EtFOSAA	0.905986	0.869926	0.895261	0.997923	0.927221	0.965712	0.981245	0.934261	1.054911	0.998453	Avg:A Wt:C2	0.953090		RSD=5.9	
	95.1	91.3	93.9	104.7	97.3	101.3	103	98	110.7	104.8	Org:N Dep:R				
D 61 d7-MeFOSE	111	112	119	109	117	109	104	103	112	112	Avg:A Wt:C2	111		RSD=4.5	
	99.8	101.3	107.4	98.5	105.3	98.6	94.2	92.6	101.1	101.3	Org:N Dep:R				
32 MeFOSE	1.037849	1.044832	0.926709	1.065816	0.982075	0.983740	0.967783	1.093903	0.988302	0.900689	Avg:A Wt:C2	0.999170		RSD=6.1	
	103.9	104.6	92.7	106.7	98.3	98.5	96.9	109.5	98.9	90.1	Org:N Dep:R				
D 57 d3-MeFOSA	68.7350	67.9360	67.6460	64.0640	76.5780	66.4500	66.7370	65.2360	65.9840	68.9420	Avg:A Wt:C2	67.8308		RSD=5.1	
	101.3	100.2	99.7	94.4	112.9	98	98.4	96.2	97.3	101.6	Org:N Dep:R				
26 MeFOSA	1.175529	1.080281	1.012255	1.032561	0.955993	1.002047	1.029432	1.034174	0.968625	0.973332	Avg:A Wt:C2	1.026423		RSD=6.3	
	114.5	105.2	98.6	100.6	93.1	97.6	100.3	100.8	94.4	94.8	Org:N Dep:R				
31 11Cl-PF3OUDS	2.421068	2.468879	2.384933	2.457695	2.141317	2.506214	2.519471	2.495543	2.528442	2.443460	Avg:A Wt:C2	2.436702		RSD=4.6	
	99.4	101.3	97.9	100.9	87.9	102.9	103.4	102.4	103.8	100.3	Org:N Dep:R				

Compound	Level 1 / %Rec	Level 2 / %Rec	Level 3 / %Rec	Level 4 / %Rec	Level 5 / %Rec	Level 6 / %Rec	Level 7 / %Rec	Level 8 / %Rec	Level 9 / %Rec	Level 10 / %Rec	Curve	M1	B	Curve Errors	Flags
D 62 d9-EtFOSE	92.6640	101	96.5060	98.0400	114	102	98.1040	97.8330	99.2050	94.4560	Avg:A Wt:C2	99.4349		RSD=6.0	
	93.2	102	97.1	98.6	115	102.3	98.7	98.4	99.8	95	Org:N Dep:R				
33 EtFOSE	Disabled	0.714638	0.768191	0.797226	0.716514	0.793926	0.764097	0.766999	0.765352	0.855269	Avg:A Wt:C2	0.771357		RSD=5.5	
	Disabled	92.6	99.6	103.4	92.9	102.9	99.1	99.4	99.2	110.9	Org:N Dep:R				
D 59 d5-EtFOSA	58.5270	59.5170	62.0030	60.9780	62.6330	62.5370	56.9590	62.4670	63.3450	59.8830	Avg:A Wt:C2	60.8849		RSD=3.4	
	96.1	97.8	101.8	100.2	102.9	102.7	93.6	102.6	104	98.4	Org:N Dep:R				
27 EtFOSA	1.210382	1.249391	1.080915	1.113943	1.137052	1.151926	1.223459	1.145888	1.081552	1.164017	Avg:A Wt:C2	1.155853		RSD=5.0	
	104.7	108.1	93.5	96.4	98.4	99.7	105.8	99.1	93.6	100.7	Org:N Dep:R				
D 38 13C2_PFDoA	690	718	770	703	794	769	645	684	614	644	Avg:A Wt:C2	703		RSD=8.6	
	98.1	102.2	109.6	100	112.9	109.4	91.7	97.3	87.4	91.6	Org:N Dep:R				
11 PFDoA	1.041489	0.970091	1.023905	0.986411	0.956402	0.951976	1.041053	0.934748	0.968582	0.954687	Avg:A Wt:C2	0.982934		RSD=4.0	
	106	98.7	104.2	100.4	97.3	96.9	105.9	95.1	98.5	97.1	Org:N Dep:R				
4 10:2 FTS	Disabled	1.764369	1.825394	1.790235	1.645550	1.753885	1.758130	1.938881	1.924886	2.045984	Avg:A Wt:C2	1.827479		RSD=6.7	
	Disabled	96.5	99.9	98	90	96	96.2	106.1	105.3	112	Org:N Dep:R				
34 PFDOS	0.805984	0.848931	0.839159	0.822234	0.725490	0.857721	0.847633	0.862599	0.906462	0.865735	Avg:A Wt:C2	0.838195		RSD=5.7	
	96.2	101.3	100.1	98.1	86.6	102.3	101.1	102.9	108.1	103.3	Org:N Dep:R				
24 PFTrDA	0.511174	0.492751	0.419128	0.445649	0.426054	0.447363	0.494364	0.469638	0.492554	0.459679	Avg:A Wt:C2	0.465835		RSD=6.7	
	109.7	105.8	90	95.7	91.5	96	106.1	100.8	105.7	98.7	Org:N Dep:R				
D 42 13C2_PFTeDA	853	915	903	809	950	878	838	858	855	822	Avg:A Wt:C2	868		RSD=5.0	
	98.3	105.4	104.1	93.2	109.4	101.1	96.5	98.8	98.5	94.7	Org:N Dep:R				
23 PFTeDA	1.027943	0.882960	0.897816	0.948781	0.849860	0.934492	0.907567	0.826985	0.791622	0.850416	Avg:A Wt:C2	0.891844		RSD=7.6	
	115.3	99	100.7	106.4	95.3	104.8	101.8	92.7	88.8	95.4	Org:N Dep:R				
35 PFHxDA	2.513558	2.121845	2.067290	2.217357	1.917506	1.916842	1.872083	1.863798	1.768470	1.784744	Avg:A Wt:C2	2.004349		RSD=11.5	
	125.4	105.9	103.1	110.6	95.7	95.6	93.4	93	88.2	89	Org:N Dep:R				
D 40 13C2_PFHxDA	302	347	345	303	358	342	327	307	318	324	Avg:A Wt:C2	328		RSD=6.1	
	92.3	105.9	105.5	92.5	109.2	104.6	100	93.9	97.2	99.1	Org:N Dep:R				
36 PFODA	1.346949	1.270536	1.252233	1.442788	1.304282	1.312347	1.309495	1.412545	1.268278	1.291235	Avg:A Wt:C2	1.321069		RSD=4.7	
	102	96.2	94.8	109.2	98.7	99.3	99.1	106.9	96	97.7	Org:N Dep:R				

Report Date: 14-Dec-2021 14:13:11 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Initial Calibration Ion Suppression Report

Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 11-Dec-2021 12:00:51 Cal End Date: 11-Dec-2021 13:36:15

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes

Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	121121012.d	ICAL 50_SVLC-1740	11-Dec-2021 12:00:51
2	121121013.d	ICAL 100_SVLC-1741	11-Dec-2021 12:11:24
3	121121014.d	ICAL 200_SVLC-1742	11-Dec-2021 12:22:00
4	121121015.d	ICAL 500_SVLC-1743	11-Dec-2021 12:32:35
5	121121016.d	ICAL 1000_SVLC-1761	11-Dec-2021 12:43:12
6	121121017.d	ICAL 2000_SVLC-1745	11-Dec-2021 12:53:46
7	121121018.d	ICAL 5000_SVLC-1746	11-Dec-2021 13:04:23
8	121121019.d	ICAL 10000_SVLC-1747	11-Dec-2021 13:15:00
9	121121020.d	ICAL 15000_SVLC-1748	11-Dec-2021 13:25:36
10	121121021.d	ICAL 20000_SVLC-1749	11-Dec-2021 13:36:15

Column: 1 Detector: LCMS-Q3

Compound	Response Level 1	Response Level 2	Response Level 3	Response Level 4	Response Level 5	Response Level 6	Response Level 7	Response Level 8	Response Level 9	Response Level 10	RPD
* 37 13C2_PFDA	834930	828967	802961	863281	1057507	848874	820187	734589	732528	682967	5.00
* 39 13C2_PFHxA	944986	973666	1009666	914394	992599	997801	925664	887606	844743	892418	1.43
* 41 13C2_PFOA	883033	959725	985357	861468	986762	928597	837873	817451	744035	762980	3.64
* 43 13C3_PFBA	1110536	1172059	1186196	1117505	1227846	1166369	1074573	1053270	1003980	998299	2.66
* 48 13C4_PFOS	265796	269363	295709	274705	282140	264300	271440	258779	235910	242397	2.30

13C2_PFDA ((|682967 - 834930| / (682967 + 834930)) / 2) * 100 = 5.01

13C2_PFHxA ((|892418 - 944986| / (892418 + 944986)) / 2) * 100 = 1.43

13C2_PFOA ((|762980 - 883033| / (762980 + 883033)) / 2) * 100 = 3.65

13C3_PFBA ((|998299 - 1110536| / (998299 + 1110536)) / 2) * 100 = 2.66

13C4_PFOS ((|242397 - 265796| / (242397 + 265796)) / 2) * 100 = 2.30

Report Date: 14-Dec-2021 14:13:11 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Initial Calibration Response Report

Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 11-Dec-2021 12:00:51 Cal End Date: 11-Dec-2021 13:36:15
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	121121012.d	ICAL 50_SVLC-1740	11-Dec-2021 12:00:51
2	121121013.d	ICAL 100_SVLC-1741	11-Dec-2021 12:11:24
3	121121014.d	ICAL 200_SVLC-1742	11-Dec-2021 12:22:00
4	121121015.d	ICAL 500_SVLC-1743	11-Dec-2021 12:32:35
5	121121016.d	ICAL 1000_SVLC-1761	11-Dec-2021 12:43:12
6	121121017.d	ICAL 2000_SVLC-1745	11-Dec-2021 12:53:46
7	121121018.d	ICAL 5000_SVLC-1746	11-Dec-2021 13:04:23
8	121121019.d	ICAL 10000_SVLC-1747	11-Dec-2021 13:15:00
9	121121020.d	ICAL 15000_SVLC-1748	11-Dec-2021 13:25:36
10	121121021.d	ICAL 20000_SVLC-1749	11-Dec-2021 13:36:15

Quantitation Standards (* - Istd) (D - Iso Dil Std)

* 37 13C2_PFDA	* 39 13C2_PFHxA	* 41 13C2_PFOA
* 43 13C3_PFBA	* 48 13C4_PFOS	D 38 13C2_PFDoA
D 40 13C2_PFHxDA	D 42 13C2_PFTeDA	D 44 13C3_PFBS
D 45 13C3_PFHxS	D 46 13C4_PFBA	D 47 13C4_PFHpA
D 49 13C5_PFHxA	D 50 13C5_PFPeA	D 51 13C6_PFDA
D 52 13C7_PFUdA	D 53 13C8_PFOA	D 54 13C8_PFOS
D 55 13C8_PFOSA	D 56 13C9_PFNA	D 57 d3-MeFOSA
D 58 d3-MeFOSAA	D 59 d5-EtFOSA	D 60 d5-EtFOSAA
D 61 d7-MeFOSE	D 62 d9-EtFOSE	D 63 13C2_4:2 FTS_2
D 64 13C2_6:2 FTS_2	D 65 13C2_8:2 FTS_2	D 66 13C3_GenX

Column: 1 Detector: LCMS-Q3

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
D 46 13C4_PFBA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1193144	1317232	1274474	1182030	1370567	1266105	1156951	1142876	1089290	1091815	
8 PFBA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#46
	68787	148324	287344	646985	1433018	2678165	6296885	11712571	16501857	21264808	
D 50 13C5_PFPeA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	1050270	1158553	1138678	1021020	1195849	1083964	966038	996795	965828	991154	
21 PFPeA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#50
	60899	121577	244717	564165	1150000	2338995	5677181	10640020	15027937	19948715	
D 44 13C3_PFBS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	336136	370326	364480	357282	397506	370428	340914	329185	328186	330328	
7 PFBS	44.200	88.400	176.80	442.00	884.00	1768.00	4420.00	8840.00	13260	17680	#44
	25228	50581	97694	207184	462958	858700	2010425	3696557	5396347	7475763	
1 4:2 FTS	46.700	93.400	186.80	467.00	934.00	1868.00	4670.00	9340.00	14010	18680	#63
	6429	13403	26207	61316	126138	258417	607963	1108387	1663175	2139842	
D 63 13C2_4:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	325472	387620	390850	350163	348094	375997	350054	332364	315156	326264	
D 49 13C5_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	956021	978611	995899	933787	1079140	995459	970623	907010	850426	877612	
* 39 13C2_PFHxA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	944986	973666	1009666	914394	992599	997801	925664	887606	844743	892418	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
15 PFHxA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#49
	55266	112814	225413	471793	1048475	1890673	4708450	8905611	12363591	17124850	
22 PFPeS	46.900	93.800	187.60	469.00	938.00	1876.00	4690.00	9380.00	14070	18760	#44
	17502	33702	71545	150905	366407	700016	1637065	3167215	4611882	6165085	
28 GenX	100.00	200.00	400.00	1000.00	2000.00	4000.00	10000	20000	30000	40000	#66
	11136	20979	42598	101488	220405	419040	929512	1668660	2532766	3587711	
D 66 13C3_GenX	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	658363	728365	699708	638073	712245	689224	625586	574096	589890	552561	
D 47 13C4_PFHpA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	974891	967829	956211	904160	1101347	994774	924389	830679	781660	805576	
13 PFHpA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#47
	44935	99248	174942	403949	949270	1780860	4095375	7949784	10965163	14577856	
D 45 13C3_PFHxS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	289774	306105	315820	290887	344620	296828	275344	271183	269171	260266	
14 PFHxS	45.500	91.000	182.00	455.00	910.00	1820.00	4550.00	9100.00	13650	18200	#45
	16741	30989	63755	148956	336730	634829	1492185	2860658	4077401	5564971	
29 ADONA	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#45
	78617	169403	324151	737791	1676422	3218255	7540497	13927948	19904148	25880435	
2 6:2 FTS	47.400	94.800	189.60	474.00	948.00	1896.00	4740.00	9480.00	14220	18960	#64
	5186	12502	20775	49937	138374	211323	508191	869139	1286534	1614525	
D 64 13C2_6:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	336693	364458	373819	356492	402664	343601	331832	277280	274535	284576	
* 41 13C2_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	883033	959725	985357	861468	986762	928597	837873	817451	744035	762980	
D 53 13C8_PFOA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	917098	973227	962645	907731	1018047	927181	886777	784562	721733	730353	
20 PFOA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#53
	42249	101971	206731	445659	978738	1899205	4441697	7899947	11151783	14748046	
12 PFHpS	47.600	95.200	190.40	476.00	952.00	1904.00	4760.00	9520.00	14280	19040	#45
	12651	31780	59723	144890	312749	601483	1476303	2609223	3880283	5085654	
D 54 13C8_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	259295	266025	271160	270285	316103	265746	257350	249198	232385	249947	
* 48 13C4_PFOS	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	265796	269363	295709	274705	282140	264300	271440	258779	235910	242397	
18 PFOS	46.400	92.800	185.60	464.00	928.00	1856.00	4640.00	9280.00	13920	18560	#54
	17055	30184	61464	137313	302901	577330	1322837	2575702	3752024	5140235	
D 56 13C9_PFNA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	903864	944735	916021	922854	1014612	918466	862689	847907	763763	857605	
17 PFNA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#56
	40414	82059	156375	399180	818168	1571862	3804433	7327421	10143731	13530379	
30 9Cl-PF3ONS	46.600	93.200	186.40	466.00	932.00	1864.00	4660.00	9320.00	13980	18640	#54
	37585	83909	158096	363993	762417	1477688	3510686	6981701	9989505	13988783	
D 55 13C8_PFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	530620	526658	505233	473627	590521	523147	499770	516620	464270	469235	
19 PFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#55
	24589	57648	117720	273327	566189	1059548	2564895	5183186	7347048	10019169	
16 PFNS	48.000	96.000	192.00	480.00	960.00	1920.00	4800.00	9600.00	14400	19200	#54
	12970	27092	50867	122028	280516	542512	1224919	2371998	3348344	4509539	
D 51 13C6_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	826434	851416	881842	836147	913783	844054	809322	731287	692397	691842	
3 8:2 FTS	47.900	95.800	191.60	479.00	958.00	1916.00	4790.00	9580.00	14370	19160	#65
	5523	9229	19426	46404	95803	184912	416232	720901	1023695	1296597	
D 65 13C2_8:2 FTS_2	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	266099	296763	291161	278418	331004	297020	253232	217585	209309	205490	
10 PFDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#51
	40909	86614	193130	442214	904391	1650527	4176808	7571807	10435837	14430617	

Compound	Level 1 Conc/Rsp	Level 2 Conc/Rsp	Level 3 Conc/Rsp	Level 4 Conc/Rsp	Level 5 Conc/Rsp	Level 6 Conc/Rsp	Level 7 Conc/Rsp	Level 8 Conc/Rsp	Level 9 Conc/Rsp	Level 10 Conc/Rsp	Std #
* 37 13C2_PFDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	834930	828967	802961	863281	1057507	848874	820187	734589	732528	682967	
D 58 d3-MeFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1117256	1265369	1216306	1125775	1358301	1223207	1171521	1134962	1142938	1169678	
6 N-MeFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#58
	11432	21835	40597	96141	201692	402433	918799	1894877	2969575	3819329	
9 PFDS	48.200	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#54
	14236	24400	46618	122908	250230	477156	1122268	2157677	3040772	4302124	
D 60 d5-EtFOSAA	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	
	1135448	1155845	1077954	1037575	1197261	1068075	944446	1018670	789489	859345	
D 52 13C7_PFUdA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	752237	780903	769903	777856	903063	779031	723250	624138	650637	625490	
25 PFUdA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#52
	37686	71375	147429	368619	761715	1412637	3311747	5702654	7975706	10742581	
5 N-EtFOSAA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#60
	10287	20110	38602	103542	222025	412581	926733	1903407	2498521	3432061	
D 61 d7-MeFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	110517	112219	118910	109047	116596	109227	104344	102580	111982	112154	
32 MeFOSE	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#61
	5735	11725	22039	58112	114506	214902	504912	1122126	1660080	2020318	
D 57 d3-MeFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	68735	67936	67646	64064	76578	66450	66737	65236	65984	68942	
26 MeFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#57
	4040	7339	13695	33075	73208	133172	343506	674654	958706	1342069	
31 11Cl-PF3OUDS	47.100	94.200	188.40	471.00	942.00	1884.00	4710.00	9420.00	14130	18840	#54
	29568	61869	121838	312875	637618	1254775	3053897	5858151	8302392	11506256	
D 62 d9-EtFOSE	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	92664	101436	96506	98040	114355	101750	98104	97833	99205	94456	
33 EtFOSE	Disabled	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#62
	Disabled	7249	14827	39080	81937	161564	374805	750378	1138901	1615705	
D 59 d5-EtFOSA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	58527	59517	62003	60978	62633	62537	56959	62467	63345	59883	
27 EtFOSA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#59
	3542	7436	13404	33963	71217	144076	348435	715802	1027664	1394097	
D 38 13C2_PFDoA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	689628	718314	770457	703078	794156	768946	644520	684337	614352	643950	
11 PFDoA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	35912	69683	157775	346762	759532	1464037	3354897	6396823	8925754	12295409	
4 10:2 FTS	Disabled	96.400	192.80	482.00	964.00	1928.00	4820.00	9640.00	14460	19280	#65
	Disabled	10095	20494	48049	105015	200874	429187	813368	1165175	1621175	
34 PFDOS	48.400	96.800	193.60	484.00	968.00	1936.00	4840.00	9680.00	14520	19360	#54
	10115	21861	44053	107563	221991	441284	1055790	2080793	3058610	4189268	
24 PFTrDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#38
	17626	35395	64584	156663	338353	687996	1593136	3213907	4539019	5920203	
D 42 13C2_PFTeDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	853082	915443	903453	809015	949647	878218	838190	858097	854905	822471	
23 PFTeDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#42
	43846	80830	162227	383789	807067	1641375	3803568	7096331	10151419	13988845	
35 PFHxDA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	37981	73617	142803	335760	686101	1313010	3065077	5730993	8442445	11580596	
D 40 13C2_PFHxDA	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	
	302209	346948	345387	302847	357809	342493	327451	307490	318258	324433	
36 PFODA	50.000	100.00	200.00	500.00	1000.00	2000.00	5000.00	10000	15000	20000	#40
	20353	44081	86501	218472	466684	898939	2143978	4343435	6054592	8378384	

Pace Environmental Services, LLC
Initial Calibration RT Report

Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b
Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04
Instrument: LCMSMS01.i Integrator: picker
Cal Start Date: 11-Dec-2021 12:00:51 Cal End Date: 11-Dec-2021 13:36:15
Method Lock: Unknown Lock Date:
Calib Method: PFAS-ID No.Compounds: 66
Calibration Concentration Units: ng/L

Initial Calibration Samples: Primary Reagent: Analytes
Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b

Level	Cal File	Cal Sample ID	Cal Date
1	121121012.d	ICAL 50_SVLC-1740	11-Dec-2021 12:00:51
2	121121013.d	ICAL 100_SVLC-1741	11-Dec-2021 12:11:24
3	121121014.d	ICAL 200_SVLC-1742	11-Dec-2021 12:22:00
4	121121015.d	ICAL 500_SVLC-1743	11-Dec-2021 12:32:35
5	121121016.d	ICAL 1000_SVLC-1761	11-Dec-2021 12:43:12
6	121121017.d	ICAL 2000_SVLC-1745	11-Dec-2021 12:53:46
7	121121018.d	ICAL 5000_SVLC-1746	11-Dec-2021 13:04:23
8	121121019.d	ICAL 10000_SVLC-1747	11-Dec-2021 13:15:00
9	121121020.d	ICAL 15000_SVLC-1748	11-Dec-2021 13:25:36
10	121121021.d	ICAL 20000_SVLC-1749	11-Dec-2021 13:36:15

Column: 1 Detector: LCMS-Q3

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
D 46 13C4_PFBA	1.719	1.719	1.720	1.719	1.719	1.719	1.719	1.725	1.725	1.720	1.720	0.156
8 PFBA	1.719	1.726	1.720	1.725	1.726	1.725	1.725	1.725	1.725	1.720	1.723	0.150
D 50 13C5_PFPeA	2.095	2.095	2.098	2.095	2.095	2.095	2.105	2.105	2.105	2.098	2.098	0.233
21 PFPeA	2.095	2.095	2.098	2.095	2.095	2.095	2.095	2.105	2.105	2.098	2.097	0.208
D 44 13C3_PFBS	2.148	2.148	2.151	2.158	2.158	2.158	2.158	2.158	2.158	2.161	2.155	0.228
7 PFBS	2.158	2.158	2.151	2.158	2.158	2.158	2.158	2.158	2.158	2.161	2.157	0.123
1 4:2 FTS	2.440	2.440	2.443	2.440	2.449	2.449	2.449	2.449	2.449	2.443	2.445	0.158
D 63 13C2_4:2 FTS_2	2.440	2.440	2.443	2.449	2.449	2.440	2.449	2.449	2.449	2.443	2.445	0.158
D 49 13C5_PFHxA	2.485	2.485	2.487	2.484	2.484	2.484	2.484	2.484	2.484	2.488	2.485	0.051
* 39 13C2_PFHxA	2.485	2.485	2.487	2.484	2.484	2.484	2.484	2.484	2.484	2.488	2.485	0.051
15 PFHxA	2.485	2.485	2.487	2.484	2.484	2.484	2.493	2.484	2.493	2.488	2.486	0.148
22 PFPeS	2.511	2.511	2.514	2.520	2.520	2.520	2.520	2.520	2.520	2.523	2.517	0.155
28 GenX	2.599	2.606	2.601	2.606	2.606	2.614	2.614	2.614	2.614	2.609	2.608	0.207
D 66 13C3_GenX	2.606	2.606	2.609	2.606	2.606	2.614	2.614	2.614	2.606	2.609	2.609	0.123
D 47 13C4_PFHpA	2.879	2.879	2.883	2.878	2.879	2.887	2.887	2.887	2.887	2.890	2.883	0.169
13 PFHpA	2.879	2.879	2.883	2.878	2.888	2.878	2.887	2.887	2.887	2.890	2.883	0.169
D 45 13C3_PFHxS	2.888	2.896	2.892	2.896	2.896	2.896	2.905	2.896	2.905	2.899	2.897	0.183
14 PFHxS	2.897	2.896	2.901	2.896	2.896	2.896	2.905	2.905	2.905	2.899	2.899	0.138
29 ADONA	2.914	2.923	2.927	2.923	2.923	2.930	2.930	2.930	2.931	2.933	2.926	0.195
2 6:2 FTS	3.252	3.252	3.260	3.252	3.252	3.258	3.265	3.258	3.265	3.259	3.257	0.148
D 64 13C2_6:2 FTS_2	3.252	3.252	3.254	3.252	3.259	3.258	3.258	3.258	3.259	3.259	3.256	0.095
* 41 13C2_PFOA	3.278	3.278	3.279	3.284	3.284	3.284	3.284	3.284	3.284	3.285	3.282	0.087
D 53 13C8_PFOA	3.278	3.278	3.279	3.284	3.284	3.284	3.284	3.284	3.284	3.279	3.281	0.090
20 PFOA	3.284	3.278	3.279	3.284	3.284	3.284	3.290	3.284	3.284	3.285	3.283	0.104
12 PFHpS	3.284	3.284	3.286	3.284	3.291	3.290	3.290	3.290	3.297	3.291	3.288	0.126
D 54 13C8_PFOS	3.653	3.653	3.654	3.658	3.653	3.658	3.658	3.658	3.666	3.661	3.656	0.118
* 48 13C4_PFOS	3.653	3.653	3.654	3.658	3.660	3.658	3.658	3.658	3.666	3.661	3.657	0.114
18 PFOS	3.653	3.653	3.654	3.658	3.660	3.658	3.665	3.665	3.666	3.661	3.659	0.145
D 56 13C9_PFNA	3.653	3.660	3.661	3.666	3.668	3.665	3.665	3.665	3.673	3.669	3.664	0.152
17 PFNA	3.660	3.660	3.661	3.666	3.668	3.665	3.673	3.673	3.673	3.669	3.666	0.136
30 9Cl-PF3ONS	3.859	3.859	3.861	3.863	3.866	3.864	3.864	3.864	3.871	3.868	3.863	0.098
D 55 13C8_PFOSA	3.940	3.940	3.942	3.945	3.947	3.946	3.946	3.946	3.953	3.950	3.945	0.104

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Avg. RT	%Rsd RT
19 PFOSA	3.947	3.940	3.942	3.945	3.947	3.946	3.946	3.946	3.953	3.950	3.946	0.090
16 PFNS	3.993	3.985	3.995	3.998	4.000	3.999	3.999	3.999	4.006	4.002	3.997	0.145
D 51 13C6_PFDA	4.000	4.000	4.011	4.005	4.008	4.006	4.015	4.015	4.014	4.011	4.008	0.134
3 8:2 FTS	4.008	4.000	4.002	3.998	4.008	4.006	4.006	4.006	4.006	4.002	4.004	0.085
D 65 13C2_8:2 FTS_2	4.000	4.000	4.002	4.005	4.008	3.999	4.006	4.006	4.006	4.002	4.003	0.078
10 PFDA	4.008	4.008	4.011	4.005	4.008	4.015	4.015	4.015	4.023	4.019	4.012	0.141
* 37 13C2_PFDA	4.000	4.008	4.002	4.005	4.016	4.015	4.015	4.015	4.014	4.019	4.011	0.161
D 58 d3-MeFOSAA	4.159	4.159	4.162	4.159	4.159	4.158	4.166	4.166	4.166	4.162	4.161	0.088
6 N-MeFOSAA	4.167	4.167	4.162	4.167	4.167	4.166	4.166	4.166	4.175	4.170	4.167	0.080
9 PFDS	4.286	4.295	4.290	4.295	4.295	4.294	4.304	4.304	4.304	4.299	4.296	0.142
D 60 d5-EtFOSAA	4.313	4.313	4.317	4.313	4.313	4.313	4.322	4.322	4.322	4.317	4.316	0.095
D 52 13C7_PFUdA	4.304	4.313	4.317	4.313	4.313	4.313	4.322	4.322	4.322	4.317	4.315	0.130
25 PFUdA	4.304	4.313	4.308	4.313	4.313	4.313	4.322	4.322	4.322	4.326	4.315	0.166
5 N-EtFOSAA	4.313	4.322	4.317	4.322	4.322	4.322	4.322	4.331	4.331	4.326	4.323	0.130
D 61 d7-MeFOSE	4.350	4.358	4.362	4.358	4.358	4.358	4.358	4.358	4.367	4.362	4.359	0.106
32 MeFOSE	4.359	4.367	4.371	4.367	4.367	4.367	4.367	4.376	4.376	4.371	4.369	0.121
D 57 d3-MeFOSA	4.377	4.376	4.371	4.376	4.377	4.376	4.385	4.385	4.385	4.380	4.379	0.109
26 MeFOSA	4.368	4.376	4.380	4.376	4.386	4.385	4.385	4.385	4.385	4.389	4.381	0.149
31 11Cl-PF3OUDS	4.448	4.447	4.450	4.455	4.447	4.447	4.454	4.454	4.454	4.458	4.451	0.088
D 62 d9-EtFOSE	4.510	4.518	4.513	4.518	4.518	4.518	4.525	4.526	4.525	4.521	4.519	0.116
33 EtFOSE	Disabled	4.526	4.528	4.533	4.534	4.533	4.533	4.533	4.533	4.536	4.532	0.073
D 59 d5-EtFOSA	4.534	4.534	4.536	4.541	4.541	4.541	4.541	4.541	4.549	4.544	4.540	0.103
27 EtFOSA	4.542	4.549	4.544	4.541	4.549	4.549	4.549	4.549	4.549	4.552	4.547	0.080
D 38 13C2_PFDoA	4.581	4.580	4.575	4.580	4.581	4.580	4.588	4.588	4.588	4.583	4.582	0.088
11 PFDoA	4.581	4.580	4.583	4.580	4.581	4.580	4.588	4.588	4.588	4.591	4.584	0.090
4 10:2 FTS	Disabled	4.588	4.591	4.588	4.596	4.596	4.596	4.596	4.596	4.599	4.593	0.080
34 PFDOS	4.786	4.786	4.788	4.785	4.791	4.791	4.791	4.791	4.791	4.794	4.789	0.063
24 PFTrDA	4.815	4.814	4.817	4.814	4.814	4.823	4.823	4.823	4.823	4.817	4.818	0.091
D 42 13C2_PFTeDA	5.029	5.029	5.030	5.029	5.036	5.035	5.035	5.036	5.035	5.036	5.033	0.070
23 PFTeDA	5.029	5.029	5.036	5.036	5.036	5.035	5.035	5.036	5.041	5.042	5.035	0.090
35 PFHxDA	5.422	5.422	5.422	5.422	5.422	5.422	5.421	5.430	5.430	5.431	5.424	0.072
D 40 13C2_PFHxDA	5.414	5.414	5.422	5.422	5.422	5.422	5.421	5.430	5.422	5.423	5.420	0.085
36 PFODA	5.804	5.804	5.805	5.804	5.804	5.811	5.804	5.811	5.811	5.812	5.806	0.058

Pace Environmental Services, LLC
Initial Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b\121121023.d
Injection Date: 11-Dec-2021 13:57:30 Injection Vol: 10.0 uL
Sample Type: ICV Auto Sampler: 32
Sample Info: ICV 500_SVLC-1765 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: ICV Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1370567	1316681			96.1	50 - 150
8 PFBA			500.00	466.96	93.4	70 - 130
21 PFPeA			500.00	467.10	93.4	70 - 130
D 50 13C5_PFPeA	1195849	1145978			95.8	50 - 150
7 PFBS			442.50	432.83	97.8	70 - 130
D 44 13C3_PFBS	397506	367889			92.5	50 - 150
D 63 13C2_4:2 FTS_2	348094	386755			111.1	50 - 150
1 4:2 FTS			467.50	409.53	87.6	70 - 130
D 49 13C5_PFHxA	1079140	1152467			106.8	50 - 150
15 PFHxA			500.00	410.14	82	70 - 130
22 PFPeS			470.00	458.53	97.6	70 - 130
28 GenX			2500.00	2625.08	105	70 - 130
D 66 13C3_GenX	712245	681346			95.7	50 - 150
D 47 13C4_PFHpA	1101347	966829			87.8	50 - 150
13 PFHpA			500.00	477.32	95.5	70 - 130
14 PFHxS			456.00	398.80	87.5	70 - 130
D 45 13C3_PFHxS	344620	329202			95.5	50 - 150
29 ADONA			2355.00	2191.46	93.1	70 - 130
2 6:2 FTS			475.00	439.43	92.5	70 - 130
D 64 13C2_6:2 FTS_2	402664	376676			93.5	50 - 150
D 53 13C8_PFOA	1018047	993147			97.6	50 - 150
20 PFOA			500.00	449.70	89.9	70 - 130
12 PFHpS			475.00	438.92	92.4	70 - 130
D 54 13C8_PFOS	316103	269880			85.4	50 - 150
18 PFOS			462.75	440.24	95.1	70 - 130
17 PFNA			500.00	486.32	97.3	70 - 130
D 56 13C9_PFNA	1014612	939415			92.6	50 - 150
30 9Cl-PF3ONS			2330.00	2210.98	94.9	70 - 130
19 PFOSA			500.00	487.70	97.5	70 - 130
D 55 13C8_PFOSA	590521	540196			91.5	50 - 150
16 PFNS			480.00	468.28	97.6	70 - 130
3 8:2 FTS			480.00	407.69	84.9	70 - 130
D 51 13C6_PFDA	913783	894151			97.9	50 - 150
D 65 13C2_8:2 FTS_2	331004	339647			102.6	50 - 150
10 PFDA			500.00	442.98	88.6	70 - 130
D 58 d3-MeFOSAA	1358301	1342410			98.8	50 - 150

Report Date: 14-Dec-2021 14:12:56 AIM Revision: 2.0.2021.1020
Data File: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b\121121023.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			500.00	505.28	101.1	70 - 130
9 PFDS			482.50	487.41	101	70 - 130
25 PFUdA			500.00	423.92	84.8	70 - 130
D 60 d5-EtFOSAA	1197261	1172788			98	50 - 150
D 52 13C7_PFUdA	903063	926068			102.5	50 - 150
5 N-EtFOSAA			500.00	566.14	113.2	70 - 130
D 61 d7-MeFOSE	116596	111109			95.3	50 - 150
D 57 d3-MeFOSA	76578	65078			85	50 - 150
31 11Cl-PF3OUDS			2355.00	2320.89	98.6	70 - 130
D 62 d9-EtFOSE	114355	104824			91.7	50 - 150
D 59 d5-EtFOSA	62633	65007			103.8	50 - 150
D 38 13C2_PFDoA	794156	893691			112.5	50 - 150
11 PFDoA			500.00	421.86	84.4	70 - 130
4 10:2 FTS			2410.00	2308.77	95.8	70 - 130
24 PFTrDA			500.00	413.43	82.7	70 - 130
23 PFTeDA			500.00	458.50	91.7	70 - 130
D 42 13C2_PFTeDA	949647	922417			97.1	50 - 150
D 40 13C2_PFHxDA	357809	370396			103.5	50 - 150

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021005.d
Injection Date: 10-Dec-2021 11:33:12 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1741 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			100.00	119.24	119.2	70 - 130
D 46 13C4_PFBA	1177068	1168202			99.2	50 - 150
21 PFPeA			100.00	101.75	101.8	70 - 130
D 50 13C5_PFPeA	996217	1141125			114.5	50 - 150
7 PFBS			88.400	106.62	120.6	70 - 130
D 44 13C3_PFBS	348906	350925			100.6	50 - 150
D 63 13C2_4:2 FTS_2	280455	302467			107.8	50 - 150
1 4:2 FTS			93.400	94.095	100.7	70 - 130
D 49 13C5_PFHxA	1044461	964473			92.3	50 - 150
15 PFHxA			100.00	109.38	109.4	70 - 130
22 PFPeS			93.800	94.682	100.9	70 - 130
28 GenX			200.00	173.11	86.6	70 - 130
D 66 13C3_GenX	741759	803271			108.3	50 - 150
D 47 13C4_PFHpA	943366	964960			102.3	50 - 150
13 PFHpA			100.00	102.51	102.5	70 - 130
14 PFHxS			91.000	108.68	119.4	70 - 130
D 45 13C3_PFHxS	315109	290388			92.2	50 - 150
29 ADONA			94.200	96.505	102.4	70 - 130
2 6:2 FTS			94.800	92.539	97.6	70 - 130
D 64 13C2_6:2 FTS_2	220995	262895			119	50 - 150
D 53 13C8_PFOA	934678	943254			100.9	50 - 150
12 PFHpS			95.200	101.09	106.2	70 - 130
20 PFOA			100.00	108.99	109	70 - 130
D 54 13C8_PFOS	262115	260536			99.4	50 - 150
18 PFOS			92.800	106.69	115	70 - 130
17 PFNA			100.00	95.398	95.4	70 - 130
D 56 13C9_PFNA	932194	984597			105.6	50 - 150
30 9Cl-PF3ONS			93.200	94.474	101.4	70 - 130
19 PFOSA			100.00	85.614	85.6	70 - 130
D 55 13C8_PFOSA	505187	508528			100.7	50 - 150
16 PFNS			96.000	98.004	102.1	70 - 130
3 8:2 FTS			95.800	89.951	93.9	70 - 130
D 51 13C6_PFDA	871063	838410			96.3	50 - 150
D 65 13C2_8:2 FTS_2	219643	247282			112.6	50 - 150
10 PFDA			100.00	103.22	103.2	70 - 130
6 N-MeFOSAA			100.00	104.77	104.8	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1107074	1169659			105.7	50 - 150
9 PFDS			96.400	106.47	110.4	70 - 130
25 PFUdA			100.00	108.51	108.5	70 - 130
D 52 13C7_PFUdA	786201	799831			101.7	50 - 150
D 60 d5-EtFOSAA	971935	1041781			107.2	50 - 150
5 N-EtFOSAA			100.00	104.05	104.1	70 - 130
D 61 d7-MeFOSE	136765	114441			83.7	50 - 150
32 MeFOSE			100.00	116.65	116.7	70 - 130
D 57 d3-MeFOSA	56570	67768			119.8	50 - 150
26 MeFOSA			100.00	96.125	96.1	70 - 130
31 11Cl-PF3OUDS			94.200	93.408	99.2	70 - 130
D 62 d9-EtFOSE	120116	107396			89.4	50 - 150
33 EtFOSE			100.00	129.85	129.9	70 - 130
D 59 d5-EtFOSA	60147	59280			98.6	50 - 150
D 38 13C2_PFDoA	875501	775895			88.6	50 - 150
27 EtFOSA			100.00	105.43	105.4	70 - 130
11 PFDoA			100.00	104.22	104.2	70 - 130
4 10:2 FTS			96.400	72.793	75.5	70 - 130
34 PFDOS			96.800	100.85	104.2	70 - 130
24 PFTrDA			100.00	111.38	111.4	70 - 130
D 42 13C2_PFTeDA	1003760	982538			97.9	50 - 150
23 PFTeDA			100.00	96.934	96.9	70 - 130
D 40 13C2_PFHxDA	348474	393379			112.9	50 - 150
35 PFHxDA			100.00	102.61	102.6	70 - 130
36 PFODA			100.00	89.206	89.2	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021006.d
Injection Date: 10-Dec-2021 11:43:44 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1742 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			200.00	213.89	106.9	70 - 130
D 46 13C4_PFBA	1168202	1169816			100.1	50 - 150
21 PFPeA			200.00	202.17	101.1	70 - 130
D 50 13C5_PFPeA	1141125	1051669			92.2	50 - 150
7 PFBS			176.80	183.49	103.8	70 - 130
D 44 13C3_PFBS	350925	363101			103.5	50 - 150
D 63 13C2_4:2 FTS_2	302467	280873			92.9	50 - 150
1 4:2 FTS			186.80	223.80	119.8	70 - 130
D 49 13C5_PFHxA	964473	981473			101.8	50 - 150
15 PFHxA			200.00	193.50	96.8	70 - 130
22 PFPeS			187.60	181.83	96.9	70 - 130
28 GenX			400.00	411.07	102.8	70 - 130
D 66 13C3_GenX	803271	766509			95.4	50 - 150
D 47 13C4_PFHpA	964960	1019660			105.7	50 - 150
13 PFHpA			200.00	199.62	99.8	70 - 130
14 PFHxS			182.00	178.38	98	70 - 130
D 45 13C3_PFHxS	290388	298524			102.8	50 - 150
29 ADONA			188.40	191.68	101.7	70 - 130
2 6:2 FTS			189.60	197.35	104.1	70 - 130
D 64 13C2_6:2 FTS_2	262895	254516			96.8	50 - 150
D 53 13C8_PFOA	943254	922870			97.8	50 - 150
12 PFHpS			190.40	212.61	111.7	70 - 130
20 PFOA			200.00	202.09	101	70 - 130
D 54 13C8_PFOS	260536	273792			105.1	50 - 150
18 PFOS			185.60	179.25	96.6	70 - 130
17 PFNA			200.00	201.55	100.8	70 - 130
D 56 13C9_PFNA	984597	924412			93.9	50 - 150
30 9Cl-PF3ONS			186.40	194.54	104.4	70 - 130
19 PFOSA			200.00	213.29	106.6	70 - 130
D 55 13C8_PFOSA	508528	481596			94.7	50 - 150
16 PFNS			192.00	182.36	95	70 - 130
3 8:2 FTS			191.60	164.74	86	70 - 130
D 51 13C6_PFDA	838410	828565			98.8	50 - 150
D 65 13C2_8:2 FTS_2	247282	232044			93.8	50 - 150
10 PFDA			200.00	216.75	108.4	70 - 130
6 N-MeFOSAA			200.00	194.17	97.1	70 - 130

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1169659	1133245			96.9	50 - 150
9 PFDS			192.80	178.54	92.6	70 - 130
25 PFUdA			200.00	187.26	93.6	70 - 130
D 52 13C7_PFUdA	799831	825528			103.2	50 - 150
D 60 d5-EtFOSAA	1041781	1054645			101.2	50 - 150
5 N-EtFOSAA			200.00	186.19	93.1	70 - 130
D 61 d7-MeFOSE	114441	132022			115.4	50 - 150
32 MeFOSE			200.00	215.05	107.5	70 - 130
D 57 d3-MeFOSA	67768	67117			99	50 - 150
26 MeFOSA			200.00	196.77	98.4	70 - 130
31 11Cl-PF3OUDS			188.40	160.97	85.4	70 - 130
D 62 d9-EtFOSE	107396	111304			103.6	50 - 150
33 EtFOSE			200.00	196.92	98.5	70 - 130
D 59 d5-EtFOSA	59280	61151			103.2	50 - 150
D 38 13C2_PFDoA	775895	802744			103.5	50 - 150
27 EtFOSA			200.00	187.04	93.5	70 - 130
11 PFDoA			200.00	187.58	93.8	70 - 130
4 10:2 FTS			192.80	163.42	84.8	70 - 130
34 PFDOS			193.60	194.52	100.5	70 - 130
24 PFTrDA			200.00	196.26	98.1	70 - 130
D 42 13C2_PFTeDA	982538	984672			100.2	50 - 150
23 PFTeDA			200.00	190.41	95.2	70 - 130
D 40 13C2_PFHxDA	393379	391538			99.5	50 - 150
35 PFHxDA			200.00	196.23	98.1	70 - 130
36 PFODA			200.00	191.00	95.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021020.d
Injection Date: 10-Dec-2021 14:12:03 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 11
Sample Info: CCV 1000_SVLC-1761 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	974.35	97.4	70 - 130
D 46 13C4_PFBA	1168202	1266829			108.4	50 - 150
21 PFPeA			1000.00	1000.99	100.1	70 - 130
D 50 13C5_PFPeA	1141125	1119300			98.1	50 - 150
7 PFBS			884.00	812.41	91.9	70 - 130
D 44 13C3_PFBS	350925	393233			112.1	50 - 150
D 63 13C2_4:2 FTS_2	302467	315359			104.3	50 - 150
1 4:2 FTS			934.00	964.54	103.3	70 - 130
D 49 13C5_PFHxA	964473	1027554			106.5	50 - 150
15 PFHxA			1000.00	952.41	95.2	70 - 130
22 PFPeS			938.00	869.22	92.7	70 - 130
28 GenX			2000.00	1809.19	90.5	70 - 130
D 66 13C3_GenX	803271	846844			105.4	50 - 150
D 47 13C4_PFHpA	964960	949827			98.4	50 - 150
13 PFHpA			1000.00	1023.13	102.3	70 - 130
14 PFHxS			910.00	848.38	93.2	70 - 130
D 45 13C3_PFHxS	290388	327660			112.8	50 - 150
29 ADONA			942.00	888.43	94.3	70 - 130
2 6:2 FTS			948.00	940.45	99.2	70 - 130
D 64 13C2_6:2 FTS_2	262895	276659			105.2	50 - 150
D 53 13C8_PFOA	943254	1015644			107.7	50 - 150
12 PFHpS			952.00	905.70	95.1	70 - 130
20 PFOA			1000.00	942.59	94.3	70 - 130
D 54 13C8_PFOS	260536	290095			111.3	50 - 150
18 PFOS			928.00	842.16	90.7	70 - 130
17 PFNA			1000.00	954.65	95.5	70 - 130
D 56 13C9_PFNA	984597	1002457			101.8	50 - 150
30 9Cl-PF3ONS			932.00	868.66	93.2	70 - 130
19 PFOSA			1000.00	889.10	88.9	70 - 130
D 55 13C8_PFOSA	508528	567479			111.6	50 - 150
16 PFNS			960.00	871.96	90.8	70 - 130
3 8:2 FTS			958.00	959.02	100.1	70 - 130
D 51 13C6_PFDA	838410	948841			113.2	50 - 150
D 65 13C2_8:2 FTS_2	247282	250117			101.1	50 - 150
10 PFDA			1000.00	941.84	94.2	70 - 130
6 N-MeFOSAA			1000.00	891.15	89.1	70 - 130

Report Date: 11-Dec-2021 14:44:54 AIM Revision: 2.0.2021.1020
Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021020.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1169659	1272167			108.8	50 - 150
9 PFDS			964.00	896.86	93	70 - 130
25 PFUdA			1000.00	923.93	92.4	70 - 130
D 52 13C7_PFUdA	799831	833071			104.2	50 - 150
D 60 d5-EtFOSAA	1041781	1107919			106.3	50 - 150
5 N-EtFOSAA			1000.00	889.28	88.9	70 - 130
D 61 d7-MeFOSE	114441	136121			118.9	50 - 150
32 MeFOSE			1000.00	981.32	98.1	70 - 130
D 57 d3-MeFOSA	67768	62033			91.5	50 - 150
26 MeFOSA			1000.00	1088.95	108.9	70 - 130
31 11Cl-PF3OUDS			942.00	892.07	94.7	70 - 130
D 62 d9-EtFOSE	107396	125936			117.3	50 - 150
33 EtFOSE			1000.00	943.82	94.4	70 - 130
D 59 d5-EtFOSA	59280	66856			112.8	50 - 150
D 38 13C2_PFDoA	775895	827981			106.7	50 - 150
27 EtFOSA			1000.00	963.24	96.3	70 - 130
11 PFDoA			1000.00	1085.69	108.6	70 - 130
4 10:2 FTS			964.00	648.26	67.2	70 - 130
34 PFDOS			968.00	946.49	97.8	70 - 130
24 PFTrDA			1000.00	998.90	99.9	70 - 130
D 42 13C2_PFTeDA	982538	1048452			106.7	50 - 150
23 PFTeDA			1000.00	932.96	93.3	70 - 130
D 40 13C2_PFHxDA	393379	415498			105.6	50 - 150
35 PFHxDA			1000.00	906.32	90.6	70 - 130
36 PFODA			1000.00	838.29	83.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021038.d
Injection Date: 10-Dec-2021 17:22:41 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 28
Sample Info: CCV 1000A_SVLC-1761 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	965.10	96.5	70 - 130
D 46 13C4_PFBA	1168202	1307368			111.9	50 - 150
21 PFPeA			1000.00	920.49	92	70 - 130
D 50 13C5_PFPeA	1141125	1186637			104	50 - 150
7 PFBS			884.00	823.64	93.2	70 - 130
D 44 13C3_PFBS	350925	386809			110.2	50 - 150
D 63 13C2_4:2 FTS_2	302467	344030			113.7	50 - 150
1 4:2 FTS			934.00	939.40	100.6	70 - 130
D 49 13C5_PFHxA	964473	1108398			114.9	50 - 150
15 PFHxA			1000.00	935.98	93.6	70 - 130
22 PFPeS			938.00	883.43	94.2	70 - 130
28 GenX			2000.00	1756.01	87.8	70 - 130
D 66 13C3_GenX	803271	860980			107.2	50 - 150
D 47 13C4_PFHpA	964960	1076656			111.6	50 - 150
13 PFHpA			1000.00	989.74	99	70 - 130
14 PFHxS			910.00	863.54	94.9	70 - 130
D 45 13C3_PFHxS	290388	341449			117.6	50 - 150
29 ADONA			942.00	848.34	90.1	70 - 130
2 6:2 FTS			948.00	952.10	100.4	70 - 130
D 64 13C2_6:2 FTS_2	262895	293998			111.8	50 - 150
D 53 13C8_PFOA	943254	1045308			110.8	50 - 150
12 PFHpS			952.00	890.50	93.5	70 - 130
20 PFOA			1000.00	935.49	93.5	70 - 130
D 54 13C8_PFOS	260536	284425			109.2	50 - 150
18 PFOS			928.00	887.78	95.7	70 - 130
17 PFNA			1000.00	931.84	93.2	70 - 130
D 56 13C9_PFNA	984597	1004920			102.1	50 - 150
30 9Cl-PF3ONS			932.00	944.50	101.3	70 - 130
19 PFOSA			1000.00	918.87	91.9	70 - 130
D 55 13C8_PFOSA	508528	548375			107.8	50 - 150
16 PFNS			960.00	899.21	93.7	70 - 130
3 8:2 FTS			958.00	918.61	95.9	70 - 130
D 51 13C6_PFDA	838410	960607			114.6	50 - 150
D 65 13C2_8:2 FTS_2	247282	260732			105.4	50 - 150
10 PFDA			1000.00	952.70	95.3	70 - 130
6 N-MeFOSAA			1000.00	910.47	91	70 - 130

Report Date: 11-Dec-2021 14:45:10 AIM Revision: 2.0.2021.1020
Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021038.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1169659	1380824			118.1	50 - 150
9 PFDS			964.00	882.19	91.5	70 - 130
25 PFUdA			1000.00	916.50	91.6	70 - 130
D 52 13C7_PFUdA	799831	866900			108.4	50 - 150
D 60 d5-EtFOSAA	1041781	1094157			105	50 - 150
5 N-EtFOSAA			1000.00	952.97	95.3	70 - 130
D 61 d7-MeFOSE	114441	132890			116.1	50 - 150
32 MeFOSE			1000.00	923.70	92.4	70 - 130
D 57 d3-MeFOSA	67768	68190			100.6	50 - 150
26 MeFOSA			1000.00	976.68	97.7	70 - 130
31 11Cl-PF3OUDS			942.00	926.91	98.4	70 - 130
D 62 d9-EtFOSE	107396	118687			110.5	50 - 150
33 EtFOSE			1000.00	955.41	95.5	70 - 130
D 59 d5-EtFOSA	59280	64988			109.6	50 - 150
D 38 13C2_PFDoA	775895	836750			107.8	50 - 150
27 EtFOSA			1000.00	933.74	93.4	70 - 130
11 PFDoA			1000.00	933.04	93.3	70 - 130
4 10:2 FTS			964.00	668.59	69.4	70 - 130
34 PFDOS			968.00	945.22	97.6	70 - 130
24 PFTrDA			1000.00	1001.69	100.2	70 - 130
D 42 13C2_PFTeDA	982538	1031241			105	50 - 150
23 PFTeDA			1000.00	993.05	99.3	70 - 130
D 40 13C2_PFHxDA	393379	409903			104.2	50 - 150
35 PFHxDA			1000.00	866.81	86.7	70 - 130
36 PFODA			1000.00	873.53	87.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021052.d
Injection Date: 10-Dec-2021 19:51:19 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 41
Sample Info: CCV 1000B_SVLC-1761 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	996.84	99.7	70 - 130
D 46 13C4_PFBA	1168202	1272888			109	50 - 150
21 PFPeA			1000.00	883.46	88.3	70 - 130
D 50 13C5_PFPeA	1141125	1240786			108.7	50 - 150
7 PFBS			884.00	846.28	95.7	70 - 130
D 44 13C3_PFBS	350925	394430			112.4	50 - 150
D 63 13C2_4:2 FTS_2	302467	350125			115.8	50 - 150
1 4:2 FTS			934.00	975.20	104.4	70 - 130
D 49 13C5_PFHxA	964473	1050661			108.9	50 - 150
15 PFHxA			1000.00	885.97	88.6	70 - 130
22 PFPeS			938.00	906.01	96.6	70 - 130
28 GenX			2000.00	1833.30	91.7	70 - 130
D 66 13C3_GenX	803271	772908			96.2	50 - 150
D 47 13C4_PFHpA	964960	1051744			109	50 - 150
13 PFHpA			1000.00	992.50	99.3	70 - 130
14 PFHxS			910.00	809.90	89	70 - 130
D 45 13C3_PFHxS	290388	352138			121.3	50 - 150
29 ADONA			942.00	851.80	90.4	70 - 130
2 6:2 FTS			948.00	948.47	100	70 - 130
D 64 13C2_6:2 FTS_2	262895	302655			115.1	50 - 150
D 53 13C8_PFOA	943254	1069622			113.4	50 - 150
12 PFHpS			952.00	843.19	88.6	70 - 130
20 PFOA			1000.00	921.26	92.1	70 - 130
D 54 13C8_PFOS	260536	297711			114.3	50 - 150
18 PFOS			928.00	856.28	92.3	70 - 130
17 PFNA			1000.00	940.15	94	70 - 130
D 56 13C9_PFNA	984597	968318			98.3	50 - 150
30 9Cl-PF3ONS			932.00	859.28	92.2	70 - 130
19 PFOSA			1000.00	884.26	88.4	70 - 130
D 55 13C8_PFOSA	508528	573753			112.8	50 - 150
16 PFNS			960.00	910.95	94.9	70 - 130
3 8:2 FTS			958.00	847.60	88.5	70 - 130
D 51 13C6_PFDA	838410	965935			115.2	50 - 150
D 65 13C2_8:2 FTS_2	247282	288186			116.5	50 - 150
10 PFDA			1000.00	970.20	97	70 - 130
6 N-MeFOSAA			1000.00	892.06	89.2	70 - 130

Report Date: 11-Dec-2021 14:45:24 AIM Revision: 2.0.2021.1020
Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021052.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1169659	1318634			112.7	50 - 150
9 PFDS			964.00	943.04	97.8	70 - 130
25 PFUdA			1000.00	877.59	87.8	70 - 130
D 52 13C7_PFUdA	799831	906982			113.4	50 - 150
D 60 d5-EtFOSAA	1041781	1158823			111.2	50 - 150
5 N-EtFOSAA			1000.00	997.07	99.7	70 - 130
D 61 d7-MeFOSE	114441	140876			123.1	50 - 150
32 MeFOSE			1000.00	918.36	91.8	70 - 130
D 57 d3-MeFOSA	67768	60614			89.4	50 - 150
26 MeFOSA			1000.00	1050.58	105.1	70 - 130
31 11Cl-PF3OUDS			942.00	880.93	93.5	70 - 130
D 62 d9-EtFOSE	107396	131106			122.1	50 - 150
33 EtFOSE			1000.00	841.83	84.2	70 - 130
D 59 d5-EtFOSA	59280	69087			116.5	50 - 150
D 38 13C2_PFDoA	775895	830640			107.1	50 - 150
27 EtFOSA			1000.00	961.48	96.1	70 - 130
11 PFDoA			1000.00	958.54	95.9	70 - 130
4 10:2 FTS			964.00	614.23	63.7	70 - 130
34 PFDOS			968.00	947.82	97.9	70 - 130
24 PFTrDA			1000.00	1064.13	106.4	70 - 130
D 42 13C2_PFTeDA	982538	1041207			106	50 - 150
23 PFTeDA			1000.00	919.66	92	70 - 130
D 40 13C2_PFHxDA	393379	435223			110.6	50 - 150
35 PFHxDA			1000.00	852.74	85.3	70 - 130
36 PFODA			1000.00	795.51	79.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021065.d
Injection Date: 10-Dec-2021 22:09:11 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 53
Sample Info: CCV 1000C_SVLC-1761 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
8 PFBA			1000.00	949.59	95	70 - 130
D 46 13C4_PFBA	1168202	1392484			119.2	50 - 150
21 PFPeA			1000.00	978.36	97.8	70 - 130
D 50 13C5_PFPeA	1141125	1214182			106.4	50 - 150
7 PFBS			884.00	885.10	100.1	70 - 130
D 44 13C3_PFBS	350925	424195			120.9	50 - 150
D 63 13C2_4:2 FTS_2	302467	436962			144.5	50 - 150
1 4:2 FTS			934.00	887.25	95	70 - 130
D 49 13C5_PFHxA	964473	1106600			114.7	50 - 150
15 PFHxA			1000.00	992.36	99.2	70 - 130
22 PFPeS			938.00	876.28	93.4	70 - 130
28 GenX			2000.00	1835.29	91.8	70 - 130
D 66 13C3_GenX	803271	857685			106.8	50 - 150
D 47 13C4_PFHpA	964960	1106850			114.7	50 - 150
13 PFHpA			1000.00	956.65	95.7	70 - 130
14 PFHxS			910.00	884.81	97.2	70 - 130
D 45 13C3_PFHxS	290388	349312			120.3	50 - 150
29 ADONA			942.00	880.97	93.5	70 - 130
2 6:2 FTS			948.00	994.73	104.9	70 - 130
D 64 13C2_6:2 FTS_2	262895	427595			162.6	50 - 150
D 53 13C8_PFOA	943254	1155109			122.5	50 - 150
12 PFHpS			952.00	939.12	98.6	70 - 130
20 PFOA			1000.00	917.95	91.8	70 - 130
D 54 13C8_PFOS	260536	310824			119.3	50 - 150
18 PFOS			928.00	895.99	96.6	70 - 130
17 PFNA			1000.00	934.42	93.4	70 - 130
D 56 13C9_PFNA	984597	1095626			111.3	50 - 150
30 9Cl-PF3ONS			932.00	879.91	94.4	70 - 130
19 PFOSA			1000.00	949.48	94.9	70 - 130
D 55 13C8_PFOSA	508528	582076			114.5	50 - 150
16 PFNS			960.00	882.40	91.9	70 - 130
3 8:2 FTS			958.00	821.33	85.7	70 - 130
D 51 13C6_PFDA	838410	996153			118.8	50 - 150
D 65 13C2_8:2 FTS_2	247282	295966			119.7	50 - 150
10 PFDA			1000.00	941.36	94.1	70 - 130
6 N-MeFOSAA			1000.00	910.34	91	70 - 130

Report Date: 11-Dec-2021 14:45:34 AIM Revision: 2.0.2021.1020
Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021065.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 58 d3-MeFOSAA	1169659	1464081			125.2	50 - 150
9 PFDS			964.00	927.17	96.2	70 - 130
25 PFUdA			1000.00	970.12	97	70 - 130
D 52 13C7_PFUdA	799831	915605			114.5	50 - 150
D 60 d5-EtFOSAA	1041781	1219085			117	50 - 150
5 N-EtFOSAA			1000.00	979.59	98	70 - 130
D 61 d7-MeFOSE	114441	141053			123.3	50 - 150
32 MeFOSE			1000.00	947.30	94.7	70 - 130
D 57 d3-MeFOSA	67768	68565			101.2	50 - 150
26 MeFOSA			1000.00	992.02	99.2	70 - 130
31 11Cl-PF3OUDS			942.00	873.35	92.7	70 - 130
D 62 d9-EtFOSE	107396	113107			105.3	50 - 150
33 EtFOSE			1000.00	1149.69	115	70 - 130
D 59 d5-EtFOSA	59280	66773			112.6	50 - 150
D 38 13C2_PFDoA	775895	913704			117.8	50 - 150
27 EtFOSA			1000.00	1037.73	103.8	70 - 130
11 PFDoA			1000.00	981.35	98.1	70 - 130
4 10:2 FTS			964.00	630.22	65.4	70 - 130
34 PFDOS			968.00	936.14	96.7	70 - 130
24 PFTrDA			1000.00	997.30	99.7	70 - 130
D 42 13C2_PFTeDA	982538	1104088			112.4	50 - 150
23 PFTeDA			1000.00	958.79	95.9	70 - 130
D 40 13C2_PFHxDA	393379	446097			113.4	50 - 150
35 PFHxDA			1000.00	897.59	89.8	70 - 130
36 PFODA			1000.00	808.78	80.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b\121121059.d
Injection Date: 11-Dec-2021 20:18:46 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 44
Sample Info: CCV 1000A_SVLC-1761 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1370567	1354319			98.8	50 - 150
8 PFBA			1000.00	924.24	92.4	70 - 130
21 PFPeA			1000.00	931.94	93.2	70 - 130
D 50 13C5_PFPeA	1195849	1186978			99.3	50 - 150
7 PFBS			884.00	799.50	90.4	70 - 130
D 44 13C3_PFBS	397506	403895			101.6	50 - 150
D 63 13C2_4:2 FTS_2	348094	442708			127.2	50 - 150
1 4:2 FTS			934.00	860.82	92.2	70 - 130
D 49 13C5_PFHxA	1079140	1110998			103	50 - 150
15 PFHxA			1000.00	779.36	77.9	70 - 130
22 PFPeS			938.00	882.88	94.1	70 - 130
28 GenX			2000.00	1854.58	92.7	70 - 130
D 66 13C3_GenX	712245	747519			105	50 - 150
D 47 13C4_PFHpA	1101347	1040422			94.5	50 - 150
13 PFHpA			1000.00	935.18	93.5	70 - 130
14 PFHxS			910.00	855.67	94	70 - 130
D 45 13C3_PFHxS	344620	338192			98.1	50 - 150
29 ADONA			942.00	869.91	92.3	70 - 130
2 6:2 FTS			948.00	1055.92	111.4	70 - 130
D 64 13C2_6:2 FTS_2	402664	461893			114.7	50 - 150
D 53 13C8_PFOA	1018047	1066780			104.8	50 - 150
20 PFOA			1000.00	980.28	98	70 - 130
12 PFHpS			952.00	912.80	95.9	70 - 130
D 54 13C8_PFOS	316103	295049			93.3	50 - 150
18 PFOS			928.00	861.37	92.8	70 - 130
17 PFNA			1000.00	1044.88	104.5	70 - 130
D 56 13C9_PFNA	1014612	959832			94.6	50 - 150
30 9Cl-PF3ONS			932.00	856.43	91.9	70 - 130
19 PFOSA			1000.00	875.79	87.6	70 - 130
D 55 13C8_PFOSA	590521	607439			102.9	50 - 150
16 PFNS			960.00	920.08	95.8	70 - 130
3 8:2 FTS			958.00	793.58	82.8	70 - 130
D 51 13C6_PFDA	913783	917702			100.4	50 - 150
D 65 13C2_8:2 FTS_2	331004	354683			107.2	50 - 150
10 PFDA			1000.00	967.55	96.8	70 - 130
D 58 d3-MeFOSAA	1358301	1406891			103.6	50 - 150

Report Date: 14-Dec-2021 14:12:58 AIM Revision: 2.0.2021.1020
Data File: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b\121121059.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	921.32	92.1	70 - 130
9 PFDS			964.00	884.73	91.8	70 - 130
25 PFUdA			1000.00	887.09	88.7	70 - 130
D 60 d5-EtFOSAA	1197261	1172654			97.9	50 - 150
D 52 13C7_PFUdA	903063	891610			98.7	50 - 150
5 N-EtFOSAA			1000.00	1031.64	103.2	70 - 130
D 61 d7-MeFOSE	116596	126274			108.3	50 - 150
32 MeFOSE			1000.00	858.98	85.9	70 - 130
D 57 d3-MeFOSA	76578	63534			83	50 - 150
26 MeFOSA			1000.00	1174.57	117.5	70 - 130
31 11Cl-PF3OUDS			942.00	946.22	100.4	70 - 130
D 62 d9-EtFOSE	114355	111401			97.4	50 - 150
33 EtFOSE			1000.00	1084.10	108.4	70 - 130
D 59 d5-EtFOSA	62633	64581			103.1	50 - 150
27 EtFOSA			1000.00	1053.04	105.3	70 - 130
D 38 13C2_PFDoA	794156	838564			105.6	50 - 150
11 PFDoA			1000.00	915.99	91.6	70 - 130
4 10:2 FTS			964.00	793.59	82.3	70 - 130
34 PFDOS			968.00	961.80	99.4	70 - 130
24 PFTrDA			1000.00	871.34	87.1	70 - 130
23 PFTeDA			1000.00	1010.26	101	70 - 130
D 42 13C2_PFTeDA	949647	997804			105.1	50 - 150
35 PFHxDA			1000.00	863.64	86.4	70 - 130
D 40 13C2_PFHxDA	357809	412058			115.2	50 - 150
36 PFODA			1000.00	818.00	81.8	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b\121121074.d
Injection Date: 11-Dec-2021 22:58:00 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 57
Sample Info: CCV 1000B_SVLC-1761 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1370567	1490440			108.7	50 - 150
8 PFBA			1000.00	975.01	97.5	70 - 130
21 PFPeA			1000.00	936.00	93.6	70 - 130
D 50 13C5_PFPeA	1195849	1389374			116.2	50 - 150
7 PFBS			884.00	792.27	89.6	70 - 130
D 44 13C3_PFBS	397506	449082			113	50 - 150
D 63 13C2_4:2 FTS_2	348094	465125			133.6	50 - 150
1 4:2 FTS			934.00	859.90	92.1	70 - 130
D 49 13C5_PFHxA	1079140	1209877			112.1	50 - 150
15 PFHxA			1000.00	876.38	87.6	70 - 130
22 PFPeS			938.00	912.73	97.3	70 - 130
28 GenX			2000.00	1942.64	97.1	70 - 130
D 66 13C3_GenX	712245	794777			111.6	50 - 150
D 47 13C4_PFHpA	1101347	1188096			107.9	50 - 150
13 PFHpA			1000.00	893.19	89.3	70 - 130
14 PFHxS			910.00	765.52	84.1	70 - 130
D 45 13C3_PFHxS	344620	379346			110.1	50 - 150
29 ADONA			942.00	868.97	92.2	70 - 130
2 6:2 FTS			948.00	1081.44	114.1	70 - 130
D 64 13C2_6:2 FTS_2	402664	560786			139.3	50 - 150
D 53 13C8_PFOA	1018047	1272786			125	50 - 150
20 PFOA			1000.00	845.74	84.6	70 - 130
12 PFHpS			952.00	927.73	97.5	70 - 130
D 54 13C8_PFOS	316103	337439			106.7	50 - 150
18 PFOS			928.00	852.01	91.8	70 - 130
17 PFNA			1000.00	1038.15	103.8	70 - 130
D 56 13C9_PFNA	1014612	1092225			107.6	50 - 150
30 9Cl-PF3ONS			932.00	847.29	90.9	70 - 130
19 PFOSA			1000.00	1027.04	102.7	70 - 130
D 55 13C8_PFOSA	590521	610983			103.5	50 - 150
16 PFNS			960.00	975.60	101.6	70 - 130
3 8:2 FTS			958.00	892.92	93.2	70 - 130
D 51 13C6_PFDA	913783	1027871			112.5	50 - 150
D 65 13C2_8:2 FTS_2	331004	350740			106	50 - 150
10 PFDA			1000.00	904.49	90.4	70 - 130
D 58 d3-MeFOSAA	1358301	1637986			120.6	50 - 150

Report Date: 14-Dec-2021 14:13:06 AIM Revision: 2.0.2021.1020
Data File: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b\121121074.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	875.35	87.5	70 - 130
9 PFDS			964.00	822.30	85.3	70 - 130
25 PFUdA			1000.00	957.00	95.7	70 - 130
D 60 d5-EtFOSAA	1197261	1308819			109.3	50 - 150
D 52 13C7_PFUdA	903063	951755			105.4	50 - 150
5 N-EtFOSAA			1000.00	955.86	95.6	70 - 130
D 61 d7-MeFOSE	116596	137116			117.6	50 - 150
32 MeFOSE			1000.00	971.41	97.1	70 - 130
D 57 d3-MeFOSA	76578	66537			86.9	50 - 150
26 MeFOSA			1000.00	1132.07	113.2	70 - 130
31 11Cl-PF3OUDS			942.00	802.95	85.2	70 - 130
D 62 d9-EtFOSE	114355	118981			104	50 - 150
33 EtFOSE			1000.00	1033.04	103.3	70 - 130
D 59 d5-EtFOSA	62633	78244			124.9	50 - 150
27 EtFOSA			1000.00	931.54	93.2	70 - 130
D 38 13C2_PFDoA	794156	938487			118.2	50 - 150
11 PFDoA			1000.00	952.53	95.3	70 - 130
4 10:2 FTS			964.00	820.94	85.2	70 - 130
34 PFDOS			968.00	879.85	90.9	70 - 130
24 PFTrDA			1000.00	875.18	87.5	70 - 130
23 PFTeDA			1000.00	944.00	94.4	70 - 130
D 42 13C2_PFTeDA	949647	1017813			107.2	50 - 150
35 PFHxDA			1000.00	888.31	88.8	70 - 130
D 40 13C2_PFHxDA	357809	424774			118.7	50 - 150
36 PFODA			1000.00	955.14	95.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b\121121078.d
Injection Date: 11-Dec-2021 23:40:45 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 60
Sample Info: CCV 1000C_SVLC-1761 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1370567	1526731			111.4	50 - 150
8 PFBA			1000.00	946.42	94.6	70 - 130
21 PFPeA			1000.00	941.62	94.2	70 - 130
D 50 13C5_PFPeA	1195849	1372706			114.8	50 - 150
7 PFBS			884.00	826.02	93.4	70 - 130
D 44 13C3_PFBS	397506	454980			114.5	50 - 150
D 63 13C2_4:2 FTS_2	348094	452034			129.9	50 - 150
1 4:2 FTS			934.00	862.52	92.3	70 - 130
D 49 13C5_PFHxA	1079140	1246388			115.5	50 - 150
15 PFHxA			1000.00	782.26	78.2	70 - 130
22 PFPeS			938.00	909.65	97	70 - 130
28 GenX			2000.00	1999.09	100	70 - 130
D 66 13C3_GenX	712245	792282			111.2	50 - 150
D 47 13C4_PFHpA	1101347	1181726			107.3	50 - 150
13 PFHpA			1000.00	911.84	91.2	70 - 130
14 PFHxS			910.00	865.21	95.1	70 - 130
D 45 13C3_PFHxS	344620	375898			109.1	50 - 150
29 ADONA			942.00	841.19	89.3	70 - 130
2 6:2 FTS			948.00	1022.20	107.8	70 - 130
D 64 13C2_6:2 FTS_2	402664	464071			115.3	50 - 150
D 53 13C8_PFOA	1018047	1118740			109.9	50 - 150
20 PFOA			1000.00	966.57	96.7	70 - 130
12 PFHpS			952.00	954.09	100.2	70 - 130
D 54 13C8_PFOS	316103	338240			107	50 - 150
18 PFOS			928.00	833.05	89.8	70 - 130
17 PFNA			1000.00	987.23	98.7	70 - 130
D 56 13C9_PFNA	1014612	1155048			113.8	50 - 150
30 9Cl-PF3ONS			932.00	845.50	90.7	70 - 130
19 PFOSA			1000.00	908.16	90.8	70 - 130
D 55 13C8_PFOSA	590521	656337			111.1	50 - 150
16 PFNS			960.00	912.55	95.1	70 - 130
3 8:2 FTS			958.00	905.25	94.5	70 - 130
D 51 13C6_PFDA	913783	1072253			117.3	50 - 150
D 65 13C2_8:2 FTS_2	331004	379655			114.7	50 - 150
10 PFDA			1000.00	935.55	93.6	70 - 130
D 58 d3-MeFOSAA	1358301	1559591			114.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	911.61	91.2	70 - 130
9 PFDS			964.00	882.53	91.5	70 - 130
25 PFUdA			1000.00	917.30	91.7	70 - 130
D 60 d5-EtFOSAA	1197261	1371942			114.6	50 - 150
D 52 13C7_PFUdA	903063	959024			106.2	50 - 150
5 N-EtFOSAA			1000.00	939.67	94	70 - 130
D 61 d7-MeFOSE	116596	134106			115	50 - 150
32 MeFOSE			1000.00	895.90	89.6	70 - 130
D 57 d3-MeFOSA	76578	72861			95.1	50 - 150
26 MeFOSA			1000.00	1137.11	113.7	70 - 130
31 11Cl-PF3OUDS			942.00	865.58	91.9	70 - 130
D 62 d9-EtFOSE	114355	122095			106.8	50 - 150
33 EtFOSE			1000.00	958.97	95.9	70 - 130
D 59 d5-EtFOSA	62633	71019			113.4	50 - 150
27 EtFOSA			1000.00	1066.59	106.7	70 - 130
D 38 13C2_PFDoA	794156	935740			117.8	50 - 150
11 PFDoA			1000.00	953.61	95.4	70 - 130
4 10:2 FTS			964.00	820.11	85.1	70 - 130
34 PFDOS			968.00	877.73	90.7	70 - 130
24 PFTrDA			1000.00	979.81	98	70 - 130
23 PFTeDA			1000.00	969.92	97	70 - 130
D 42 13C2_PFTeDA	949647	1058337			111.4	50 - 150
35 PFHxDA			1000.00	866.32	86.6	70 - 130
D 40 13C2_PFHxDA	357809	456557			127.6	50 - 150
36 PFODA			1000.00	849.30	84.9	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS01.i\121420-DOD.b\121421005.d
Injection Date: 14-Dec-2021 11:26:31 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 95
Sample Info: CCV 100_SVLC-1741 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-2 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1370567	1357508			99	50 - 150
8 PFBA			100.00	119.34	119.3	70 - 130
21 PFPeA			100.00	108.75	108.7	70 - 130
D 50 13C5_PFPeA	1195849	1152407			96.4	50 - 150
7 PFBS			88.400	109.84	124.2	70 - 130
D 44 13C3_PFBS	397506	383273			96.4	50 - 150
D 63 13C2_4:2 FTS_2	348094	352164			101.2	50 - 150
1 4:2 FTS			93.400	87.927	94.1	70 - 130
D 49 13C5_PFHxA	1079140	1087020			100.7	50 - 150
15 PFHxA			100.00	100.49	100.5	70 - 130
22 PFPeS			93.800	101.87	108.6	70 - 130
28 GenX			200.00	212.50	106.2	70 - 130
D 66 13C3_GenX	712245	679929			95.5	50 - 150
D 47 13C4_PFHpA	1101347	1070782			97.2	50 - 150
13 PFHpA			100.00	95.255	95.3	70 - 130
14 PFHxS			91.000	86.043	94.6	70 - 130
D 45 13C3_PFHxS	344620	338631			98.3	50 - 150
29 ADONA			94.200	86.584	91.9	70 - 130
2 6:2 FTS			94.800	89.873	94.8	70 - 130
D 64 13C2_6:2 FTS_2	402664	310333			77.1	50 - 150
D 53 13C8_PFOA	1018047	1011307			99.3	50 - 150
20 PFOA			100.00	101.85	101.9	70 - 130
12 PFHpS			95.200	88.317	92.8	70 - 130
D 54 13C8_PFOS	316103	280975			88.9	50 - 150
18 PFOS			92.800	92.671	99.9	70 - 130
17 PFNA			100.00	101.39	101.4	70 - 130
D 56 13C9_PFNA	1014612	994452			98	50 - 150
30 9Cl-PF3ONS			93.200	96.868	103.9	70 - 130
19 PFOSA			100.00	99.359	99.4	70 - 130
D 55 13C8_PFOSA	590521	538371			91.2	50 - 150
16 PFNS			96.000	83.593	87.1	70 - 130
3 8:2 FTS			95.800	87.596	91.4	70 - 130
D 51 13C6_PFDA	913783	859104			94	50 - 150
D 65 13C2_8:2 FTS_2	331004	290561			87.8	50 - 150
10 PFDA			100.00	99.863	99.9	70 - 130
D 58 d3-MeFOSAA	1358301	1131734			83.3	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			100.00	88.969	89	70 - 130
9 PFDS			96.400	100.22	104	70 - 130
25 PFUdA			100.00	98.115	98.1	70 - 130
D 60 d5-EtFOSAA	1197261	1122167			93.7	50 - 150
D 52 13C7_PFUdA	903063	890497			98.6	50 - 150
5 N-EtFOSAA			100.00	105.48	105.5	70 - 130
D 61 d7-MeFOSE	116596	123311			105.8	50 - 150
32 MeFOSE			100.00	100.78	100.8	70 - 130
D 57 d3-MeFOSA	76578	63960			83.5	50 - 150
26 MeFOSA			100.00	104.51	104.5	70 - 130
31 11Cl-PF3OUDS			94.200	94.648	100.5	70 - 130
D 62 d9-EtFOSE	114355	116208			101.6	50 - 150
33 EtFOSE			100.00	104.23	104.2	70 - 130
D 59 d5-EtFOSA	62633	63413			101.2	50 - 150
27 EtFOSA			100.00	107.92	107.9	70 - 130
D 38 13C2_PFDoA	794156	846613			106.6	50 - 150
11 PFDoA			100.00	97.878	97.9	70 - 130
4 10:2 FTS			96.400	87.854	91.1	70 - 130
34 PFDOS			96.800	93.159	96.2	70 - 130
24 PFTrDA			100.00	79.441	79.4	70 - 130
23 PFTeDA			100.00	107.50	107.5	70 - 130
D 42 13C2_PFTeDA	949647	915405			96.4	50 - 150
35 PFHxDA			100.00	105.73	105.7	70 - 130
D 40 13C2_PFHxDA	357809	310138			86.7	50 - 150
36 PFODA			100.00	104.55	104.6	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS01.i\121420-DOD.b\121421006.d
Injection Date: 14-Dec-2021 11:37:03 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 96
Sample Info: CCV 200_SVLC-1742 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-3 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1357508	1324143			97.5	50 - 150
8 PFBA			200.00	219.86	109.9	70 - 130
21 PFPeA			200.00	207.64	103.8	70 - 130
D 50 13C5_PFPeA	1152407	1211488			105.1	50 - 150
7 PFBS			176.80	200.15	113.2	70 - 130
D 44 13C3_PFBS	383273	382234			99.7	50 - 150
D 63 13C2_4:2 FTS_2	352164	349845			99.3	50 - 150
1 4:2 FTS			186.80	199.99	107.1	70 - 130
D 49 13C5_PFHxA	1087020	1057593			97.3	50 - 150
15 PFHxA			200.00	196.22	98.1	70 - 130
22 PFPeS			187.60	181.45	96.7	70 - 130
28 GenX			400.00	410.15	102.5	70 - 130
D 66 13C3_GenX	679929	646821			95.1	50 - 150
D 47 13C4_PFHpA	1070782	1086651			101.5	50 - 150
13 PFHpA			200.00	181.43	90.7	70 - 130
14 PFHxS			182.00	180.06	98.9	70 - 130
D 45 13C3_PFHxS	338631	327750			96.8	50 - 150
29 ADONA			188.40	177.25	94.1	70 - 130
2 6:2 FTS			189.60	192.17	101.4	70 - 130
D 64 13C2_6:2 FTS_2	310333	327706			105.6	50 - 150
D 53 13C8_PFOA	1011307	975347			96.4	50 - 150
20 PFOA			200.00	198.83	99.4	70 - 130
12 PFHpS			190.40	191.78	100.7	70 - 130
D 54 13C8_PFOS	280975	262936			93.6	50 - 150
18 PFOS			185.60	208.67	112.4	70 - 130
17 PFNA			200.00	214.20	107.1	70 - 130
D 56 13C9_PFNA	994452	960679			96.6	50 - 150
30 9Cl-PF3ONS			186.40	201.14	107.9	70 - 130
19 PFOSA			200.00	203.93	102	70 - 130
D 55 13C8_PFOSA	538371	542328			100.7	50 - 150
16 PFNS			192.00	191.24	99.6	70 - 130
3 8:2 FTS			191.60	193.94	101.2	70 - 130
D 51 13C6_PFDA	859104	857808			99.8	50 - 150
D 65 13C2_8:2 FTS_2	290561	268218			92.3	50 - 150
10 PFDA			200.00	199.47	99.7	70 - 130
D 58 d3-MeFOSAA	1131734	1163913			102.8	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			200.00	192.89	96.4	70 - 130
9 PFDS			192.80	221.65	115	70 - 130
25 PFUdA			200.00	201.39	100.7	70 - 130
D 60 d5-EtFOSAA	1122167	1058242			94.3	50 - 150
D 52 13C7_PFUdA	890497	844005			94.8	50 - 150
5 N-EtFOSAA			200.00	224.63	112.3	70 - 130
D 61 d7-MeFOSE	123311	117805			95.5	50 - 150
32 MeFOSE			200.00	208.49	104.2	70 - 130
D 57 d3-MeFOSA	63960	67695			105.8	50 - 150
26 MeFOSA			200.00	196.61	98.3	70 - 130
31 11Cl-PF3OUDS			188.40	187.04	99.3	70 - 130
D 62 d9-EtFOSE	116208	107306			92.3	50 - 150
33 EtFOSE			200.00	214.10	107	70 - 130
D 59 d5-EtFOSA	63413	62813			99.1	50 - 150
27 EtFOSA			200.00	190.13	95.1	70 - 130
D 38 13C2_PFDoA	846613	790347			93.4	50 - 150
11 PFDoA			200.00	188.76	94.4	70 - 130
4 10:2 FTS			192.80	209.15	108.5	70 - 130
34 PFDOS			193.60	196.26	101.4	70 - 130
24 PFTrDA			200.00	166.02	83	70 - 130
23 PFTeDA			200.00	210.90	105.4	70 - 130
D 42 13C2_PFTeDA	915405	879746			96.1	50 - 150
35 PFHxDA			200.00	193.34	96.7	70 - 130
D 40 13C2_PFHxDA	310138	329509			106.2	50 - 150
36 PFODA			200.00	200.91	100.5	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS01.i\121420-DOD.b\121421022.d
Injection Date: 14-Dec-2021 14:26:22 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 13
Sample Info: CCV 1000_SVLC-1761 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1357508	1478478			108.9	50 - 150
8 PFBA			1000.00	959.30	95.9	70 - 130
21 PFPeA			1000.00	925.97	92.6	70 - 130
D 50 13C5_PFPeA	1152407	1328222			115.3	50 - 150
7 PFBS			884.00	842.21	95.3	70 - 130
D 44 13C3_PFBS	383273	427045			111.4	50 - 150
D 63 13C2_4:2 FTS_2	352164	365735			103.9	50 - 150
1 4:2 FTS			934.00	1007.04	107.8	70 - 130
D 49 13C5_PFHxA	1087020	1223214			112.5	50 - 150
15 PFHxA			1000.00	881.05	88.1	70 - 130
22 PFPeS			938.00	888.24	94.7	70 - 130
28 GenX			2000.00	2040.71	102	70 - 130
D 66 13C3_GenX	679929	709697			104.4	50 - 150
D 47 13C4_PFHpA	1070782	1178463			110.1	50 - 150
13 PFHpA			1000.00	983.57	98.4	70 - 130
14 PFHxS			910.00	881.18	96.8	70 - 130
D 45 13C3_PFHxS	338631	349926			103.3	50 - 150
29 ADONA			942.00	891.67	94.7	70 - 130
2 6:2 FTS			948.00	998.44	105.3	70 - 130
D 64 13C2_6:2 FTS_2	310333	357904			115.3	50 - 150
D 53 13C8_PFOA	1011307	1214408			120.1	50 - 150
20 PFOA			1000.00	831.34	83.1	70 - 130
12 PFHpS			952.00	963.43	101.2	70 - 130
D 54 13C8_PFOS	280975	324637			115.5	50 - 150
18 PFOS			928.00	821.72	88.5	70 - 130
17 PFNA			1000.00	967.39	96.7	70 - 130
D 56 13C9_PFNA	994452	1115595			112.2	50 - 150
30 9Cl-PF3ONS			932.00	880.56	94.5	70 - 130
19 PFOSA			1000.00	913.32	91.3	70 - 130
D 55 13C8_PFOSA	538371	636231			118.2	50 - 150
16 PFNS			960.00	839.05	87.4	70 - 130
3 8:2 FTS			958.00	791.49	82.6	70 - 130
D 51 13C6_PFDA	859104	1064042			123.9	50 - 150
D 65 13C2_8:2 FTS_2	290561	325507			112	50 - 150
10 PFDA			1000.00	849.35	84.9	70 - 130
D 58 d3-MeFOSAA	1131734	1381141			122	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	900.05	90	70 - 130
9 PFDS			964.00	903.98	93.8	70 - 130
25 PFUdA			1000.00	928.85	92.9	70 - 130
D 60 d5-EtFOSAA	1122167	1316154			117.3	50 - 150
D 52 13C7_PFUdA	890497	889488			99.9	50 - 150
5 N-EtFOSAA			1000.00	886.86	88.7	70 - 130
D 61 d7-MeFOSE	123311	146856			119.1	50 - 150
32 MeFOSE			1000.00	907.01	90.7	70 - 130
D 57 d3-MeFOSA	63960	67560			105.6	50 - 150
26 MeFOSA			1000.00	1107.91	110.8	70 - 130
31 11Cl-PF3OUDS			942.00	856.46	90.9	70 - 130
D 62 d9-EtFOSE	116208	123087			105.9	50 - 150
33 EtFOSE			1000.00	952.47	95.2	70 - 130
D 59 d5-EtFOSA	63413	66767			105.3	50 - 150
27 EtFOSA			1000.00	1024.10	102.4	70 - 130
D 38 13C2_PFDoA	846613	913465			107.9	50 - 150
11 PFDoA			1000.00	905.70	90.6	70 - 130
4 10:2 FTS			964.00	749.03	77.7	70 - 130
34 PFDOS			968.00	861.32	89	70 - 130
24 PFTrDA			1000.00	822.61	82.3	70 - 130
23 PFTeDA			1000.00	988.71	98.9	70 - 130
D 42 13C2_PFTeDA	915405	1004791			109.8	50 - 150
35 PFHxDA			1000.00	931.30	93.1	70 - 130
D 40 13C2_PFHxDA	310138	378037			121.9	50 - 150
36 PFODA			1000.00	903.69	90.4	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS01.i\121420-DOD.b\121421038.d
Injection Date: 14-Dec-2021 17:15:48 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 28
Sample Info: CCV 1000A_SVLC-1761 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1357508	1262893			93	50 - 150
8 PFBA			1000.00	973.49	97.3	70 - 130
21 PFPeA			1000.00	908.28	90.8	70 - 130
D 50 13C5_PFPeA	1152407	1149949			99.8	50 - 150
7 PFBS			884.00	834.03	94.3	70 - 130
D 44 13C3_PFBS	383273	387792			101.2	50 - 150
D 63 13C2_4:2 FTS_2	352164	347763			98.8	50 - 150
1 4:2 FTS			934.00	855.45	91.6	70 - 130
D 49 13C5_PFHxA	1087020	1005517			92.5	50 - 150
15 PFHxA			1000.00	941.16	94.1	70 - 130
22 PFPeS			938.00	879.93	93.8	70 - 130
28 GenX			2000.00	1877.50	93.9	70 - 130
D 66 13C3_GenX	679929	691118			101.6	50 - 150
D 47 13C4_PFHpA	1070782	970166			90.6	50 - 150
13 PFHpA			1000.00	925.78	92.6	70 - 130
14 PFHxS			910.00	876.74	96.3	70 - 130
D 45 13C3_PFHxS	338631	296290			87.5	50 - 150
29 ADONA			942.00	925.32	98.2	70 - 130
2 6:2 FTS			948.00	1030.37	108.7	70 - 130
D 64 13C2_6:2 FTS_2	310333	315360			101.6	50 - 150
D 53 13C8_PFOA	1011307	973811			96.3	50 - 150
20 PFOA			1000.00	963.40	96.3	70 - 130
12 PFHpS			952.00	933.52	98.1	70 - 130
D 54 13C8_PFOS	280975	280884			100	50 - 150
18 PFOS			928.00	847.21	91.3	70 - 130
17 PFNA			1000.00	1048.24	104.8	70 - 130
D 56 13C9_PFNA	994452	958027			96.3	50 - 150
30 9Cl-PF3ONS			932.00	854.32	91.7	70 - 130
19 PFOSA			1000.00	889.25	88.9	70 - 130
D 55 13C8_PFOSA	538371	567149			105.3	50 - 150
16 PFNS			960.00	887.19	92.4	70 - 130
3 8:2 FTS			958.00	795.43	83	70 - 130
D 51 13C6_PFDA	859104	885881			103.1	50 - 150
D 65 13C2_8:2 FTS_2	290561	289622			99.7	50 - 150
10 PFDA			1000.00	889.62	89	70 - 130
D 58 d3-MeFOSAA	1131734	1326266			117.2	50 - 150

Report Date: 15-Dec-2021 08:48:07 AIM Revision: 2.0.2021.1020
Data File: \\Organics\II\LCMSMS01.i\121420-DOD.b\121421038.d

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	832.70	83.3	70 - 130
9 PFDS			964.00	919.71	95.4	70 - 130
25 PFUdA			1000.00	945.99	94.6	70 - 130
D 60 d5-EtFOSAA	1122167	1099840			98	50 - 150
D 52 13C7_PFUdA	890497	800490			89.9	50 - 150
5 N-EtFOSAA			1000.00	966.94	96.7	70 - 130
D 61 d7-MeFOSE	123311	119968			97.3	50 - 150
32 MeFOSE			1000.00	922.75	92.3	70 - 130
D 57 d3-MeFOSA	63960	59762			93.4	50 - 150
26 MeFOSA			1000.00	1019.66	102	70 - 130
31 11Cl-PF3OUDS			942.00	906.63	96.2	70 - 130
D 62 d9-EtFOSE	116208	107087			92.2	50 - 150
33 EtFOSE			1000.00	1026.57	102.7	70 - 130
D 59 d5-EtFOSA	63413	64194			101.2	50 - 150
27 EtFOSA			1000.00	972.74	97.3	70 - 130
D 38 13C2_PFDoA	846613	748727			88.4	50 - 150
11 PFDoA			1000.00	977.41	97.7	70 - 130
4 10:2 FTS			964.00	885.50	91.9	70 - 130
34 PFDOS			968.00	935.59	96.7	70 - 130
24 PFTrDA			1000.00	876.98	87.7	70 - 130
23 PFTeDA			1000.00	944.80	94.5	70 - 130
D 42 13C2_PFTeDA	915405	925549			101.1	50 - 150
35 PFHxDA			1000.00	901.44	90.1	70 - 130
D 40 13C2_PFHxDA	310138	334944			108	50 - 150
36 PFODA			1000.00	921.28	92.1	70 - 130

Pace Environmental Services, LLC
Continuing Calibration Verification Report

Data File: \\ORGANICS\LL\LCMSMS01.i\121420-DOD.b\121421058.d
Injection Date: 14-Dec-2021 20:48:02 Injection Vol: 10.0 uL
Sample Type: CCV Auto Sampler: 47
Sample Info: CCV 1000B_SVLC-1761 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Analytes Conc. Level: L-5 Vol. Added: 1.00 ml

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
D 46 13C4_PFBA	1357508	1663152			122.5	50 - 150
8 PFBA			1000.00	964.56	96.5	70 - 130
21 PFPeA			1000.00	847.50	84.7	70 - 130
D 50 13C5_PFPeA	1152407	1624449			141	50 - 150
7 PFBS			884.00	815.75	92.3	70 - 130
D 44 13C3_PFBS	383273	503978			131.5	50 - 150
D 63 13C2_4:2 FTS_2	352164	487581			138.5	50 - 150
1 4:2 FTS			934.00	869.96	93.1	70 - 130
D 49 13C5_PFHxA	1087020	1440425			132.5	50 - 150
15 PFHxA			1000.00	885.04	88.5	70 - 130
22 PFPeS			938.00	913.48	97.4	70 - 130
28 GenX			2000.00	1906.84	95.3	70 - 130
D 66 13C3_GenX	679929	894346			131.5	50 - 150
D 47 13C4_PFHpA	1070782	1337393			124.9	50 - 150
13 PFHpA			1000.00	935.54	93.6	70 - 130
14 PFHxS			910.00	808.74	88.9	70 - 130
D 45 13C3_PFHxS	338631	446816			131.9	50 - 150
29 ADONA			942.00	828.65	88	70 - 130
2 6:2 FTS			948.00	1085.04	114.5	70 - 130
D 64 13C2_6:2 FTS_2	310333	411605			132.6	50 - 150
D 53 13C8_PFOA	1011307	1269803			125.6	50 - 150
20 PFOA			1000.00	939.40	93.9	70 - 130
12 PFHpS			952.00	871.77	91.6	70 - 130
D 54 13C8_PFOS	280975	386051			137.4	50 - 150
18 PFOS			928.00	833.28	89.8	70 - 130
17 PFNA			1000.00	971.65	97.2	70 - 130
D 56 13C9_PFNA	994452	1320105			132.7	50 - 150
30 9Cl-PF3ONS			932.00	805.62	86.4	70 - 130
19 PFOSA			1000.00	959.18	95.9	70 - 130
D 55 13C8_PFOSA	538371	708901			131.7	50 - 150
16 PFNS			960.00	846.67	88.2	70 - 130
3 8:2 FTS			958.00	861.85	90	70 - 130
D 51 13C6_PFDA	859104	1125383			131	50 - 150
D 65 13C2_8:2 FTS_2	290561	348748			120	50 - 150
10 PFDA			1000.00	919.49	91.9	70 - 130
D 58 d3-MeFOSAA	1131734	1571649			138.9	50 - 150

Compound	Std Area	CCV Area	Exp. Conc ng/L	Conc ng/L	%Rec	%Rec Limits
6 N-MeFOSAA			1000.00	864.77	86.5	70 - 130
9 PFDS			964.00	812.37	84.3	70 - 130
25 PFUdA			1000.00	914.25	91.4	70 - 130
D 60 d5-EtFOSAA	1122167	1409232			125.6	50 - 150
D 52 13C7_PFUdA	890497	1019481			114.5	50 - 150
5 N-EtFOSAA			1000.00	906.86	90.7	70 - 130
D 61 d7-MeFOSE	123311	161064			130.6	50 - 150
32 MeFOSE			1000.00	912.13	91.2	70 - 130
D 57 d3-MeFOSA	63960	81356			127.2	50 - 150
26 MeFOSA			1000.00	1087.33	108.7	70 - 130
31 11Cl-PF3OUDS			942.00	839.20	89.1	70 - 130
D 62 d9-EtFOSE	116208	133051			114.5	50 - 150
33 EtFOSE			1000.00	952.83	95.3	70 - 130
D 59 d5-EtFOSA	63413	81931			129.2	50 - 150
27 EtFOSA			1000.00	1010.74	101.1	70 - 130
D 38 13C2_PFDoA	846613	1032029			121.9	50 - 150
11 PFDoA			1000.00	932.11	93.2	70 - 130
4 10:2 FTS			964.00	930.00	96.5	70 - 130
34 PFDOS			968.00	848.28	87.6	70 - 130
24 PFTrDA			1000.00	831.10	83.1	70 - 130
23 PFTeDA			1000.00	965.92	96.6	70 - 130
D 42 13C2_PFTeDA	915405	1209823			132.2	50 - 150
35 PFHxDA			1000.00	856.61	85.7	70 - 130
D 40 13C2_PFHxDA	310138	454790			146.6	50 - 150
36 PFODA			1000.00	901.56	90.2	70 - 130

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021007.d
Injection Date: 10-Dec-2021 11:54:16 Injection Vol: 10.0 uL
Sample Type: InstBlk Auto Sampler: 97
Lab Sample ID: ID IBLK A-IS 20_SVLC-1785 Lab Prep. Batch:
Sample Info: ID IBLK A-IS 20_SVLC-1785 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.719	1.714	0	1067608	19	>100:1			1001.00	1011.41	91.4	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.720		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.095	2.088	0	957947	16	>100:1			1001.00	1005.07	83.9	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.098		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.147	2.151	0	311358	14	>100:1			1001.00	955.25	88.7	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													U
298.9 > 80	44		2.151		ND								
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.505		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.431	2.434	0	270505	17	>100:1			5005.00	5481.63	89.4	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.434		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.475	2.479	0	857480	17	>100:1			1001.00	975.20	88.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.479		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.598	2.601	0	719001	18	>100:1			5005.00	5220.26	89.5	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.594		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.869	2.863	0	883460	18	>100:1			1001.00	1012.83	91.6	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.863		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.887	2.881	0	282879	16	>100:1			1001.00	1047.79	97.4	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.890		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.908		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.272		ND								
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.239	3.240	0	235326	22	>100:1			5005.00	5740.54	89.5	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.240		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.265	3.266	0	824110	20	>100:1			1001.00	1005.30	87.4	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.266		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.643	3.639	0	229562	19	>100:1			1001.00	968.22	88.1	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.646		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.841		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		3.979		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.280		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.434		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.770		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.643	3.646	0	874323	19	>100:1			1001.00	1045.92	88.8	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.646		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.923	3.927	0	476005	18	>100:1			1001.00	1060.74	93.6	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.927		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		3.990	3.987	0	744645	18	>100:1			1001.00	970.77	88.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		3.994		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		3.983	3.987	0	202049	18	>100:1			5005.00	5434.22	81.7	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		3.987		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.575		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.142	4.146	0	1013312	17	>100:1			5005.00	5187.66	86.6	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.146		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.304	4.299	0	780251	15	>100:1			1001.00	1069.96	97.6	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.299		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.294	4.299	0	912030	17	>100:1			5005.00	5275.77	87.5	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.308		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.349	4.344	0	113278	14	>100:1			1001.00	921.03	99	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.353		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.367	4.362	0	54473	13	>100:1			1001.00	856.00	80.4	
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.362		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.502	4.505	0	100162	15	>100:1			1001.00	922.45	93.3	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.513		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.525	4.528	0	59292	17	>100:1			1001.00	1008.97	100	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.528		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.564	4.567	0	680889	18	>100:1			1001.00	865.90	87.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.567		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.805		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.014	5.016	0	845167	18	>100:1			1001.00	939.83	86	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		5.016		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.405	5.406	0	359367	18	>100:1			1001.00	1155.12	91.4	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.405	5.406	0/0	6593	16	52:1	Target = 12.58		9.2049	9.2049		
813 > 269	40	5.413	5.406		447	16	14:1	14.74 (6.29-18.87)					M
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.791		ND								
*** 37 13C2_PFDA**													
515 > 470		3.990	3.987	0	899519	18	>100:1			200.00			
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.475	2.479	0	1090928	17	>100:1			200.00			
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.265	3.266	0	961633	22	>100:1			200.00			
*** 43 13C3_PFBA**													
216 > 172		1.719	1.714	0	1196436	20	>100:1			200.00			
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.643	3.639	0	292816	19	>100:1			200.00			

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit
M - Compound Hit/Peak Manually Integrated

Pace Environmental Services, LLC
Analyte Quantitation Report

Data File: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b\121121025.d
Injection Date: 11-Dec-2021 14:18:39 Injection Vol: 10.0 uL
Sample Type: InstBlk Auto Sampler: 97
Lab Sample ID: ID IBLK A Lab Prep. Batch:
Sample Info: ID IBLK A Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Reagent: Istds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.719	1.719	0	1169306	19	>100:1			1001.00	967.61	85.3	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													U
212.9 > 168.9	46		1.726		ND								
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.095	2.095	0	1039867	17	>100:1			1001.00	983.96	87	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													U
262.9 > 218.9	50		2.095		ND								
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.158	2.158	0	341122	15	>100:1			1001.00	967.78	85.8	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.158	2.158	0/0	1305	12	13:1	Target = 3.73		2.7701	2.7701		
298.9 > 99	44	2.158	2.158		649	10	4.4:1	2.01 (1.86-5.60)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													U
349 > 80	44		2.520		ND								
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.449	2.449	0	339402	18	>100:1			5005.00	4845.78	97.5	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.449		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.484	2.484	0	915827	17	>100:1			1001.00	959.52	84.9	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													U
313 > 269	49		2.484		ND								
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.614	2.606	0	654489	19	>100:1			5005.00	5059.35	91.9	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													
285 > 119	66	2.573	2.606	-2/-2	676	12	4.2:1	Target = 0.80		6.7553	6.7553		
285 > 185	66	2.614	2.606		969	16	3.4:1	0.69 (0.40-1.20)					
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.887	2.879	1	897595	18	>100:1			1001.00	971.26	81.5	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U
363 > 319	47		2.888		ND								
D 45 13C3_PFHxS CAS: SESI-0096													
402 > 80		2.905	2.896	1	287182	17	>100:1			1001.00	983.50	83.3	
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4													U
399 > 80	45		2.896		ND								
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U
377 > 251	45		2.923		ND								
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U
449 > 80	45		3.291		ND								

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
D 64 13C2_6:2 FTS_2 CAS: SESI-0105													
429 > 81		3.258	3.259	0	313013	21	>100:1			5005.00	4677.49	77.7	
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U
427 > 407	64		3.252		ND								
D 53 13C8_PFOA CAS: SESI-0097													
421 > 376		3.290	3.284	0	852908	21	>100:1			1001.00	965.99	83.8	
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													U
413 > 369	53		3.284		ND								
D 54 13C8_PFOS CAS: SESI-0098													
507 > 80		3.668	3.653	1	255603	19	>100:1			1001.00	969.11	80.9	
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1													U
499 > 80	54		3.660		ND								
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U
531 > 351	54		3.866		ND								
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U
549 > 80	54		4.000		ND								
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U
599 > 80	54		4.295		ND								
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U
631 > 451	54		4.447		ND								
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U
699 > 80	54		4.791		ND								
D 56 13C9_PFNA CAS: SESI-0099													
472 > 427		3.675	3.668	0	840988	19	>100:1			1001.00	939.39	82.9	
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U
463 > 419	56		3.668		ND								
D 55 13C8_PFOSA CAS: SESI-0107													
506 > 78		3.955	3.947	0	450773	19	>100:1			1001.00	883.92	76.3	
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U
498 > 78	55		3.947		ND								
D 51 13C6_PFDA CAS: SESI-0115													
519 > 474		4.016	4.008	1	792888	17	>100:1			1001.00	981.48	86.8	
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U
513 > 469	51		4.008		ND								
D 65 13C2_8:2 FTS_2 CAS: SESI-0106													
529 > 81		4.008	4.008	0	288077	18	>100:1			5005.00	5443.47	87	
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U
527 > 507	65		4.008		ND								
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U
627 > 607	65		4.596		ND								
D 58 d3-MeFOSAA CAS: SESI-0102													
573 > 419		4.175	4.159	1	1146354	18	>100:1			5005.00	4806.39	84.4	
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U
570 > 419	58		4.167		ND								
D 52 13C7_PFUdA CAS: SESI-0117													
570 > 525		4.322	4.313	1	733514	16	>100:1			1001.00	993.05	81.2	
25 Perfluoro-n-undecanoic acid (PFUdA) CAS: 2058-94-8													U
563 > 519	52		4.313		ND								
D 60 d5-EtFOSAA CAS: SESI-0110													
589 > 419		4.322	4.313	1	1053680	16	>100:1			5005.00	5122.86	88	
5 N-ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA) CAS: 2991-50-6													U
584 > 419	60		4.322		ND								
D 61 d7-MeFOSE CAS: SESI-0129													
623 > 59		4.367	4.358	1	113489	15	>100:1			1001.00	1024.66	97.3	
32 2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE) CAS: 24448-09-7													U
616 > 59	61		4.367		ND								
D 57 d3-MeFOSA CAS: SESI-0109													
515 > 169		4.386	4.377	1	65008	15	>100:1			1001.00	958.38	84.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	Cal Conc ng/L	OnCol Conc ng/L	%Rec	Flags
26 N-methylperfluoro-1-octanesulfonamide (MeFOSA) CAS: 31506-32-8													U
512 > 169	57		4.386		ND								
D 62 d9-EtFOSE CAS: SESI-0130													
639 > 59		4.526	4.518	0	109803	19	>100:1			1001.00	1104.27	96	
33 2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE) CAS: 1691-99-2													U
630 > 59	62		4.534		ND								
D 59 d5-EtFOSA CAS: SESI-0108													
531 > 169		4.549	4.541	0	60871	15	>100:1			1001.00	999.77	97.2	
27 N-ethylperfluoro-1-octanesulfonamide (EtFOSA) CAS: 4151-50-2													U
526 > 169	59		4.549		ND								
D 38 13C2_PFDoA CAS: SESI-0118													
615 > 570		4.588	4.581	0	745067	18	>100:1			1001.00	1059.58	93.8	
11 Perfluoro-n-dodecanoic acid (PFDoA) CAS: 307-55-1													U
613 > 569	38		4.581		ND								
24 Perfluoro-n-tridecanoic acid (PFTrDA) CAS: 72629-94-8													U
663 > 619	38		4.814		ND								
D 42 13C2_PFTeDA CAS: SESI-0119													
715 > 670		5.042	5.036	0	903332	20	>100:1			1001.00	1040.40	95.1	
23 Perfluoro-n-tetradecanoic acid (PFTeDA) CAS: 376-06-7													U
713 > 669	42		5.036		ND								
D 40 13C2_PFHxDA CAS: SESI-0103													
815 > 770		5.430	5.422	0	343997	19	>100:1			1001.00	1050.27	96.1	
35 Perfluoro-n-hexadecanoic acid (PFHxDA) CAS: 67905-19-5													
813 > 769	40	5.430	5.422	0/0	5366	18	21:1	Target = 12.88		7.7903	7.7903		
813 > 269	40	5.430	5.422		301	15	15:1	17.82 (6.44-19.32)					
36 Perfluoro-n-octadecanoic acid (PFODA) CAS: 16517-11-6													U
913 > 869	40		5.804		ND								
*** 37 13C2_PFDA**													
515 > 470		4.016	4.016	0	918091	18	>100:1			200.00			
*** 39 13C2_PFHxA CAS: SESI-0120**													
315 > 270		2.484	2.484	0	1064368	17	>100:1			200.00			
*** 41 13C2_PFOA CAS: 864071-08-9**													
415 > 370		3.290	3.284	0	983467	21	>100:1			200.00			
*** 43 13C3_PFBA**													
216 > 172		1.719	1.719	0	1251677	19	>100:1			200.00			
*** 48 13C4_PFOS CAS: 2795-39-3**													
503 > 80		3.668	3.660	0	292717	18	>100:1			200.00			

Compound Type Legend

D - Isotopic Dilution Std.
* - ISTD

QC Flag Legend

U - Result Less Than Method Detection Limit

Extract Dilution Preparations

537	**1X**	**5X**	**10X**	**20X**	**50X**	**100X**	**200X**	**500X**	**1000X**	**2000X**
EXTRACT (uL)	950	200	100	50	20	10	20	8	4	2
IS (uL)	50	40	45	47.5	49	49.5	199	199.6	199.8	199.9
96% MeOH (uL)	-	760	855	902.5	931	940.5	3781	3792.4	3796.2	3798.1
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/Vol	1/(Vol*0.2)	1/(Vol*0.1)	1/(Vol*0.05)	1/(Vol*0.02)	1/(Vol*0.01)	1/(Vol*0.005)	1/(Vol*0.002)	1/(Vol*0.001)	1/(Vol*0.0005)
ID Aq	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	(1/0.91)* (FV/V_o)	5* (FV/V_o)	10* (FV/V_o)	20* (FV/V_o)	50* (FV/V_o)	100* (FV/V_o)	200* (FV/V_o)	500* (FV/V_o)	1000* (FV/V_o)	2000* (FV/V_o)
DAI	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
SAMPLE (uL)	700	140	70	35	14	7	14	5.6	2.8	1.4
SUR (uL)	25	25	25	25	25	25	100	100	100	100
MeOH (uL)	275	275	275	275	275	275	1100	1100	1100	1100
Water (uL)	0	560	630	665	686	693	2786	2794.4	2797.2	2798.6
TOTAL (uL)	1000	1000	1000	1000	1000	1000	4000	4000	4000	4000
CF calc	1/.7	1/.14	1/.07	1/.035	1/.014	1/.007	4/.014	4/.0056	4/.0028	4/.0014
ID Solid	1X	5X	10X	20X	50X	100X	200X	500X	1000X	2000X
EXTRACT (uL)	182	200	100	50	20	10	20	8	4	2
IS (uL)	10	50	50	50	50	50	200	200	200	200
SUR (uL)	0	40	45	47.5	49	49.5	199	199.6	199.8	199.9
MeOH (uL)	0	674	769	816.5	845	854.5	3437	3448	3452	3454
WATER (uL)	8	36	36	36	36	36	144	144	144	144
TOTAL (uL)	200	1000	1000	1000	1000	1000	4000	3999.6	3999.8	3999.9
CF calc	((V_E/(M*S))/ 0.91)/1000	((V_E/(M*S))/ 0.2)/1000	((V_E/(M*S))/ 0.1)/1000	((V_E/(M*S))/ 0.05)/1000	((V_E/(M*S))/ 0.02)/1000	((V_E/(M*S))/ 0.01)/1000	((V_E/(M*S))/ 0.005)/1000	((V_E/ (M*S))/ 0.002)/1000	((V_E/ (M*S))/ 0.001)/1000	((V_E/ (M*S))/ 0.0005)/1000

NOTE: Dilutions of 100x or below will be prepped in 1-mL FV; dilutions higher than 100x and will be prepped in 4-mL FV.

Report Date: 09-Dec-2021 08:50:16 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\120821-DOD-ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 08-Dec-2021 16:22:41 Cal End Date: 08-Dec-2021 17:57:54

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
1	ICAL 50_SVLC-1740	08-Dec-2021 16:22:41	120821014.d	ICal					Analytes	L-1	1.00		
2	ICAL 100_SVLC-1741	08-Dec-2021 16:33:13	120821015.d	ICal					Analytes	L-2	1.00		
3	ICAL 200_SVLC-1742	08-Dec-2021 16:43:46	120821016.d	ICal					Analytes	L-3	1.00		
4	ICAL 500_SVLC-1743	08-Dec-2021 16:54:20	120821017.d	ICal					Analytes	L-4	1.00		
5	ICAL 1000_SVLC-1761	08-Dec-2021 17:04:53	120821018.d	ICal					Analytes	L-5	1.00	Yes	
6	ICAL 2000_SVLC-1745	08-Dec-2021 17:15:28	120821019.d	ICal					Analytes	L-6	1.00		
7	ICAL 5000_SVLC-1746	08-Dec-2021 17:26:02	120821020.d	ICal					Analytes	L-7	1.00		
8	ICAL 10000_SVLC-1747	08-Dec-2021 17:36:39	120821021.d	ICal					Analytes	L-8	1.00		
9	ICAL 15000_SVLC-1748	08-Dec-2021 17:47:15	120821022.d	ICal					Analytes	L-9	1.00		
10	ICAL 20000_SVLC-1749	08-Dec-2021 17:57:54	120821023.d	ICal					Analytes	L-10	1.00		
100	ID BLK C1	08-Dec-2021 18:08:33	120821024.d	InstBlk					Surrogates	Smp	0.1100		
11	ICV 500_SVLC-1765	08-Dec-2021 18:19:15	120821025.d	ICV					Analytes	ICV	1.00		
12	ISOMERS_SVLC-1754	08-Dec-2021 18:29:49	120821026.d	CheckStd					Surrogates	Smp	1.00	Yes	

Report Date: 11-Dec-2021 14:45:35 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Batch Run Log Report

Batch:	\\Organics\LL\LCMSMS01.i\121021-DOD.b		
Method:	LCMSMS01_PFAS-ID.M	Version: V17	16-Sep-2021 08:57:04
Instrument:	LCMSMS01.i	Integrator:	picker
Cal Start Date:	08-Dec-2021 16:22:41	Cal End Date:	08-Dec-2021 17:57:54
Method Lock:	Unknown	Lock Date:	
Calib Method:	PFAS-ID	No.Compounds:	66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	CCV 100_SVLC-1741	10-Dec-2021 11:33:12	121021005.d	CCV					Analytes	L-2	1.00		
96	CCV 200_SVLC-1742	10-Dec-2021 11:43:44	121021006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A-IS 20_SVLC-1785	10-Dec-2021 11:54:16	121021007.d	InstBlk					Surrogates	Smp	0.1100		
11	CCV 1000_SVLC-1761	10-Dec-2021 14:12:03	121021020.d	CCV					Analytes	L-5	1.00		10:2 LOW-NT
100	CCB C1	10-Dec-2021 14:22:36	121021021.d	InstBlk					Surrogates	Smp	0.1100		
12	WL02031-010	10-Dec-2021 14:33:18	121021022.d	Client	SRLF-MW0034-011.5-202112	Aqueous	1	24991	Surrogates	Smp	0.1100		RX-PFBA LOW
13	WL02031-011	10-Dec-2021 14:43:50	121021023.d	Client	SRLF-MW0041-039.5-202112	Aqueous	1	24991	Surrogates	Smp	0.1100		RX-PFBA LOW
14	WK22020-004	10-Dec-2021 14:54:23	121021024.d	Client	HBF-IW0064LI-042.5-20211	Aqueous	500	24157	Surrogates	Smp	0.1100		REPREP/RR
15	WL02025-006	10-Dec-2021 15:04:56	121021025.d	Client	MW-21-03B-120121	Aqueous	20	24703	Surrogates	Smp	0.1100		RR-50X
16	WL01021-018	10-Dec-2021 15:15:29	121021026.d	Client	SRLF-MW0019-039.5-202111	Aqueous	1	24703	Surrogates	Smp	0.1100		PFBA LOW-NCM/CONCUR, SURS HI-NCM/ND
17	WL01021-018MS	10-Dec-2021 15:26:05	121021027.d	MS		Aqueous	1	24703	Analytes	100x PDS	0.2000		
18	WL01021-018MD	10-Dec-2021 15:36:40	121021028.d	MSD		Aqueous	1	24703	Analytes	100x PDS	0.2000		
19	WK19045-002	10-Dec-2021 15:47:15	121021029.d	Client	HBF-IW0084LI-033.0-20211	Aqueous	10	24553	Surrogates	Smp	0.1100		
20	WQ24841-001	10-Dec-2021 15:57:52	121021030.d	MBlk		Aqueous	1	24841	Surrogates	Smp	0.1100		6:2 HI-OK/ND
21	WQ24841-002	10-Dec-2021 16:08:32	121021031.d	LCS		Aqueous	1	24841	Analytes	100x PDS	0.2000		
22	WL01026-009	10-Dec-2021 16:19:04	121021032.d	Client	MW-21-06A-113021-DUP	Aqueous	1	24841	Surrogates	Smp	0.1100		
23	WL01026-010	10-Dec-2021 16:29:39	121021033.d	Client	MW-21-06B-113021	Aqueous	5	24841	Surrogates	Smp	0.1100		RR-10X
24	WL01026-010MS	10-Dec-2021 16:40:20	121021034.d	MS		Aqueous	5	24841	Analytes	100x PDS	0.2000		
25	WL01026-011	10-Dec-2021 16:50:54	121021035.d	Client	MW-21-04A-113021	Aqueous	1	24841	Surrogates	Smp	0.1100		
26	WL01026-011DU	10-Dec-2021 17:01:31	121021036.d	Client		Aqueous	1	24841	Surrogates	Smp	0.1100		
27	WL01026-012	10-Dec-2021 17:12:05	121021037.d	Client	MW-21-04B-113021	Aqueous	20	24841	Surrogates	Smp	0.1100		RR-1X
28	CCV 1000A_SVLC-1761	10-Dec-2021 17:22:41	121021038.d	CCV					Analytes	L-5	1.00		
100	CCB C2	10-Dec-2021 17:33:17	121021039.d	InstBlk					Surrogates	Smp	0.1100		
29	WL02031-001	10-Dec-2021 17:43:59	121021040.d	Client	SRLF-MW0046-030.0-202112	Aqueous	1	24841	Surrogates	Smp	0.1100		RX-PFBA LOW,SURS HI-NCM/ND
30	WL02031-002	10-Dec-2021 17:54:35	121021041.d	Client	SRLF-MW0047-012.5-202112	Aqueous	1	24841	Surrogates	Smp	0.1100		SURS HI-NCM/ND
31	WL02031-003	10-Dec-2021 18:05:14	121021042.d	Client	SRLF-MW0042-012.5-202112	Aqueous	1	24841	Surrogates	Smp	0.1100		RX-PFBA LOW,SURS HI-NCM/ND
32	WL02031-004	10-Dec-2021 18:15:48	121021043.d	Client	SRLF-MW0043-029.5-202112	Aqueous	1	24841	Surrogates	Smp	0.1100		RX-PFBA LOW,SURS HI-NCM/ND
33	WL02031-005	10-Dec-2021 18:26:23	121021044.d	Client	SRLF-MW0038-012.0-202112	Aqueous	1	24841	Surrogates	Smp	0.1100		SUR HI-NCM/ND
34	WL02031-006	10-Dec-2021 18:36:58	121021045.d	Client	SRLF-MW0039-028.5-202112	Aqueous	1	24841	Surrogates	Smp	0.1100		RX-PFBA LOW-6:2HI/DET,SURS HI-NCM/ND
35	WL02031-007	10-Dec-2021 18:47:33	121021046.d	Client	SRLF-EB-20211201-01	Aqueous	1	24841	Surrogates	Smp	0.1100		
36	WL02031-008	10-Dec-2021 18:58:09	121021047.d	Client	SRLF-FB-20211201-01	Aqueous	1	24841	Surrogates	Smp	0.1100		RX-6:2 HI/DET
37	WL02031-009	10-Dec-2021 19:08:47	121021048.d	Client	SRLF-MW0035-028.5-202112	Aqueous	1	24841	Surrogates	Smp	0.1100		SURS LOW-6:2HI/DET,SURS HI-NCM/ND
38	WQ24928-001	10-Dec-2021 19:19:24	121021049.d	MBlk		Aqueous	1	24928	Surrogates	Smp	0.1100		6:2 HI-OK/ND
39	WQ24928-002	10-Dec-2021 19:30:00	121021050.d	LCS		Aqueous	1	24928	Analytes	100x PDS	0.2000		RR-FEW LOW
40	WK17067-007	10-Dec-2021 19:40:38	121021051.d	Client	FT001P-DPT1-03D-GW-11162	Aqueous	1	24928	Surrogates	Smp	0.1100		SURS HI/DET-NCM/CONCUR
41	CCV 1000B_SVLC-1761	10-Dec-2021 19:51:19	121021052.d	CCV					Analytes	L-5	1.00		
100	CCB C3	10-Dec-2021 20:01:51	121021053.d	InstBlk					Surrogates	Smp	0.1100		
42	WK18071-026	10-Dec-2021 20:12:32	121021054.d	Client	FT006P-DPT3-14D-GW-11182	Aqueous	1	24928	Surrogates	Smp	0.1100		4:2 HI-NCM/ND
43	WK20037-001	10-Dec-2021 20:23:06	121021055.d	Client	HBF-IW0081-010.0-2021111	Aqueous	50	24928	Surrogates	Smp	0.1100		RR-5X
44	WK24009-001	10-Dec-2021 20:33:42	121021056.d	Client	SBOF-P-111221	Aqueous	1	24928	Surrogates	Smp	0.1100		
45	WK24009-001MS	10-Dec-2021 20:44:16	121021057.d	MS		Aqueous	1	24928	Analytes	100x PDS	0.2000		
46	WK24009-002	10-Dec-2021 20:54:54	121021058.d	Client	SWRP-P-111221	Aqueous	1	24928	Surrogates	Smp	0.1100		SURS-NCM/MTX
47	WK24009-003	10-Dec-2021 21:05:28	121021059.d	Client	SCOF-P-111221	Aqueous	1	24928	Surrogates	Smp	0.1100		
48	WK24009-004	10-Dec-2021 21:16:05	121021060.d	Client	B1914-P-111221	Aqueous	1	24928	Surrogates	Smp	0.1100		RR-5X

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
49	WK24009-004DU	10-Dec-2021 21:26:42	121021061.d	Client		Aqueous	1	24928	Surrogates	Smp	0.1100		
53	CCV 1000C_SVLC-1761	10-Dec-2021 22:09:11	121021065.d	CCV					Analytes	L-5	1.00		6:2 EIS HI-NCM/TARGET PASS
100	CCB C4	10-Dec-2021 22:19:46	121021066.d	InstBlk					Surrogates	Smp	0.1100		

Report Date: 14-Dec-2021 14:13:11 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\Organics\LL\LCMSMS01.i\121121-DOD+ICAL.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 11-Dec-2021 12:00:51 Cal End Date: 11-Dec-2021 13:36:15

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
22	ICAL 50_SVLC-1740	11-Dec-2021 12:00:51	121121012.d	ICal					Analytes	L-1	1.00		
23	ICAL 100_SVLC-1741	11-Dec-2021 12:11:24	121121013.d	ICal					Analytes	L-2	1.00		
24	ICAL 200_SVLC-1742	11-Dec-2021 12:22:00	121121014.d	ICal					Analytes	L-3	1.00		
25	ICAL 500_SVLC-1743	11-Dec-2021 12:32:35	121121015.d	ICal					Analytes	L-4	1.00		
26	ICAL 1000_SVLC-1761	11-Dec-2021 12:43:12	121121016.d	ICal					Analytes	L-5	1.00		
27	ICAL 2000_SVLC-1745	11-Dec-2021 12:53:46	121121017.d	ICal					Analytes	L-6	1.00		
28	ICAL 5000_SVLC-1746	11-Dec-2021 13:04:23	121121018.d	ICal					Analytes	L-7	1.00		
29	ICAL 10000_SVLC-1747	11-Dec-2021 13:15:00	121121019.d	ICal					Analytes	L-8	1.00		
30	ICAL 15000_SVLC-1748	11-Dec-2021 13:25:36	121121020.d	ICal					Analytes	L-9	1.00		
31	ICAL 20000_SVLC-1749	11-Dec-2021 13:36:15	121121021.d	ICal					Analytes	L-10	1.00		
100	ID BLK C1	11-Dec-2021 13:46:49	121121022.d	InstBlk					Surrogates	Smp	0.1100		
32	ICV 500_SVLC-1765	11-Dec-2021 13:57:30	121121023.d	ICV					Analytes	ICV	1.00		
33	ISOMERS_SVLC-1754	11-Dec-2021 14:08:04	121121024.d	CheckStd					Surrogates	Smp	1.00	Yes	
97	ID IBLK A	11-Dec-2021 14:18:39	121121025.d	InstBlk					Surrogates	Smp	0.1100		
44	CCV 1000A_SVLC-1761	11-Dec-2021 20:18:46	121121059.d	CCV					Analytes	L-5	1.00		
100	CCB C2	11-Dec-2021 20:29:20	121121060.d	InstBlk					Surrogates	Smp	0.1100		
50	WK22020-004	11-Dec-2021 21:43:41	121121067.d	Client	HBF-IW0064LI-042.5-20211	Aqueous	500	24157	Surrogates	Smp	0.1100		
51	WL02025-006	11-Dec-2021 21:54:21	121121068.d	Client	MW-21-03B-120121	Aqueous	50	24703	Surrogates	Smp	0.1100		
52	WL01026-010	11-Dec-2021 22:04:56	121121069.d	Client	MW-21-06B-113021	Aqueous	10	24841	Surrogates	Smp	0.1100		
53	WL01026-010MS	11-Dec-2021 22:15:32	121121070.d	MS		Aqueous	10	24841	Analytes	100x PDS	0.2000		
54	WL01026-012	11-Dec-2021 22:26:08	121121071.d	Client	MW-21-04B-113021	Aqueous	1	24841					
55	WL02031-001	11-Dec-2021 22:36:43	121121072.d	Client	SRLF-MW0046-030.0-202112	Aqueous	1	24841	Surrogates	Smp	0.1100		PFBA LOW -NCM/RX CONCUR
56	WQ24928-002	11-Dec-2021 22:47:21	121121073.d	LCS		Aqueous	1	24928	Surrogates	Smp	0.1100		RR-MISLOADED
57	CCV 1000B_SVLC-1761	11-Dec-2021 22:58:00	121121074.d	CCV					Analytes	L-5	1.00		
100	CCB C3	11-Dec-2021 23:08:38	121121075.d	InstBlk					Surrogates	Smp	0.1100		
58	WK20037-001	11-Dec-2021 23:19:29	121121076.d	Client	HBF-IW0081-010.0-2021111	Aqueous	5	24928	Surrogates	Smp	0.1100		REPREP/RR 5X
59	WK24009-004	11-Dec-2021 23:30:07	121121077.d	Client	B1914-P-111221	Aqueous	5	24928	Surrogates	Smp	0.1100		
60	CCV 1000C_SVLC-1761	11-Dec-2021 23:40:45	121121078.d	CCV					Analytes	L-5	1.00		
100	CCB C4	11-Dec-2021 23:51:25	121121079.d	InstBlk					Surrogates	Smp	0.1100		

Report Date: 15-Dec-2021 08:48:10 AIM Revision: 2.0.2021.1020

Pace Environmental Services, LLC

Batch Run Log Report

Batch: \\ORGANICS\LL\LCMSMS01.i\121420-DOD.b

Method: LCMSMS01_PFAS-ID.M Version: V17 16-Sep-2021 08:57:04

Instrument: LCMSMS01.i Integrator: picker

Cal Start Date: 11-Dec-2021 12:00:51 Cal End Date: 11-Dec-2021 13:36:15

Method Lock: Unknown Lock Date:

Calib Method: PFAS-ID No.Compounds: 66

ALS Vial	LIMS Sample ID	Injection Date/Time	Data File	Sample Type	Client Sample ID	Matrix/ Level	Dil Fact	Prep Batch	Primary Reagent	Conc Level	Vol. Added	Inst QC	Comments
95	CCV 100_SVLC-1741	14-Dec-2021 11:26:31	121421005.d	CCV					Analytes	L-2	1.00		
96	CCV 200_SVLC-1742	14-Dec-2021 11:37:03	121421006.d	CCV					Analytes	L-3	1.00		
97	ID IBLK A	14-Dec-2021 11:47:35	121421007.d	InstBlk					Surrogates	Smp	0.1100		
3	WQ25421-001	14-Dec-2021 12:40:24	121421012.d	MBlk		Aqueous	1	25421	Surrogates	Smp	0.1100		
4	WQ25421-002	14-Dec-2021 12:50:59	121421013.d	LCS		Aqueous	1	25421	Analytes	100x PDS	0.2000		
5	WL13004-001	14-Dec-2021 13:01:33	121421014.d	Client	Decon-20211210	Aqueous	1	25421	Surrogates	Smp	0.1100		
6	WL02031-001	14-Dec-2021 13:12:09	121421015.d	Client	SRLF-MW0046-030.0-202112	Aqueous	1	25421	Surrogates	Smp	0.1100		SUR LO-NCM/MTX/HIST, SUR HI-NCM/ND
7	WL02031-003	14-Dec-2021 13:22:43	121421016.d	Client	SRLF-MW0042-012.5-202112	Aqueous	1	25421	Surrogates	Smp	0.1100		SUR LO-NCM/MTX/HIST, SUR HI-NCM/ND
8	WL02031-004	14-Dec-2021 13:33:20	121421017.d	Client	SRLF-MW0043-029.5-202112	Aqueous	1	25421	Surrogates	Smp	0.1100		SUR LO-NCM/MTX/HIST, SUR HI-NCM/ND
9	WL02031-006	14-Dec-2021 13:43:57	121421018.d	Client	SRLF-MW0039-028.5-202112	Aqueous	1	25421	Surrogates	Smp	0.1100		SUR LO,6:2 HI-DET-NCM/MTX/HIST, 4:2 HI-NCM/ND
10	WL02031-008	14-Dec-2021 13:54:36	121421019.d	Client	SRLF-FB-20211201-01	Aqueous	1	25421	Surrogates	Smp	0.1100		
11	WL02031-009	14-Dec-2021 14:05:16	121421020.d	Client	SRLF-MW0035-028.5-202112	Aqueous	1	25421	Surrogates	Smp	0.1100		SUR LO,6:2 HI-DET-NCM/MTX/HIST, 4:2 HI-NCM/ND
12	WL02031-010	14-Dec-2021 14:15:49	121421021.d	Client	SRLF-MW0034-011.5-202112	Aqueous	1	25421	Surrogates	Smp	0.1100		SUR LO,6:2 HI-DET-NCM/MTX/HIST, 4:2 HI-NCM/ND
13	CCV 1000_SVLC-1761	14-Dec-2021 14:26:22	121421022.d	CCV					Analytes	L-5	1.00		
100	CCB C1	14-Dec-2021 14:36:55	121421023.d	InstBlk					Surrogates	Smp	0.1100		
14	WL02031-011	14-Dec-2021 14:47:36	121421024.d	Client	SRLF-MW0041-039.5-202112	Aqueous	1	25421	Surrogates	Smp	0.1100		SUR LO,6:2 HI-DET-NCM/MTX/HIST, 4:2 HI-NCM/ND
15	WL03034-002	14-Dec-2021 14:58:09	121421025.d	Client	FH-IDW-W-120221	Aqueous	1	25421	Surrogates	Smp	0.1100		RX-PFDA LO, 6:2 HI-DET. 8:2 HI-NCM/ND
16	WL04010-010	14-Dec-2021 15:08:43	121421026.d	Client	SRLF-SW0006-000.5-202112	Aqueous	1	25421	Surrogates	Smp	0.1100		PFBA LO-NCM/MTX-HIST. 4:2 HI-NCM/ND
17	WL04010-011	14-Dec-2021 15:19:18	121421027.d	Client	SRLF-SW0007-000.5-202112	Aqueous	1	25421	Surrogates	Smp	0.1100		PFBA LO-NCM/MTX-HIST. FTSs HI-NCM/ND
18	WL03091-002	14-Dec-2021 15:29:53	121421028.d	Client	OU2-EFF-1221A	Aqueous	1	25421	Surrogates	Smp	0.1100		
19	WL03091-002MS	14-Dec-2021 15:40:28	121421029.d	MS		Aqueous	1	25421	Analytes	100x PDS	0.2000		
20	WL03091-002MD	14-Dec-2021 15:51:06	121421030.d	MSD		Aqueous	1	25421	Analytes	100x PDS	0.2000		
21	WL07007-001	14-Dec-2021 16:01:45	121421031.d	Client	21Q4-OU3MW-12-GW-01-0	Aqueous	1	25421	Surrogates	Smp	0.1100		
22	WL07007-002	14-Dec-2021 16:12:18	121421032.d	Client	21Q4-OU3MW-12-GW-01-1	Aqueous	1	25421	Surrogates	Smp	0.1100		
23	WL07007-003	14-Dec-2021 16:22:51	121421033.d	Client	21Q4-OU3MW-25-GW-01-0	Aqueous	1	25421	Surrogates	Smp	0.1100		RR-5X
24	WL07007-004	14-Dec-2021 16:33:26	121421034.d	Client	21Q4-PFASRI-FB-03	Aqueous	1	25421	Surrogates	Smp	0.1100		
25	WL07008-001	14-Dec-2021 16:44:00	121421035.d	Client	CCF-IW0073-020.0-2021120	Aqueous	50	25421	Surrogates	Smp	0.1100		RR-1X
26	WL07008-002	14-Dec-2021 16:54:37	121421036.d	Client	CCF-IW0074-010.0-2021120	Aqueous	50	25421	Surrogates	Smp	0.1100		RR-1X
27	WL07008-003	14-Dec-2021 17:05:11	121421037.d	Client	CCF-IW0071-020.0-2021120	Aqueous	50	25421	Surrogates	Smp	0.1100		RR-1X
28	CCV 1000A_SVLC-1761	14-Dec-2021 17:15:48	121421038.d	CCV					Analytes	L-5	1.00		
100	CCB C2	14-Dec-2021 17:26:25	121421039.d	InstBlk					Surrogates	Smp	0.1100		
29	WQ24928-002	14-Dec-2021 17:37:07	121421040.d	LCS		Aqueous	1	24928	Analytes	100x PDS	0.2000		
30	WK20037-001	14-Dec-2021 17:47:43	121421041.d	Client	HBF-IW0081-010.0-2021111	Aqueous	5	24928	Surrogates	Smp	0.1100		RR-1X-MISMATCH
47	CCV 1000B_SVLC-1761	14-Dec-2021 20:48:02	121421058.d	CCV					Analytes	L-5	1.00		
100	CCB C3	14-Dec-2021 20:58:40	121421059.d	InstBlk					Surrogates	Smp	0.1100		

Analyst: ASD **Level 2 Analyst:** N/A

Status: Level 1 review released

Matrix: Aqueous

Printed: 12/27/21 1840

Prep Batch: 24928

PFAS Prep by ID SOP QSMB-15 - PFAS Aqueous Preparation

Start Date: 12/08/2021 1451

End Date: 12/08/2021 1730

Conc Analyst: ASD

Conc Start Date: 12/08/2021 1109

Conc End Date: 12/08/2021 1109

Surrogate: SVLC-1779

Surrogate Vol. (mL): 0.110

Ext Solvent: MECH-96%/MECH/4%/H2O

Reagents Vol. (mL): 10

Chem ID: 21-2770>21-2770/21-2505

Balance ID: Balance # 20-1123

Sample ID	QC Code	Client Sample ID	Run	Analysis Method	Container + Sample (g)	Container Empty (g)	Initial Vol. (mL)	Spike ID	Spike Vol. (mL)	Final Vol. (mL)	Comments
WQ24928-001	MB		1	PFAS by ID SOP QSMB-15	280	30	250		0.000	10.0	MB init:285.85g,fin:31.67g;LCS init:286.31g,fin:31.91g; NCM65403
WQ24928-002	LCS		1	PFAS by ID SOP QSMB-15	280	30	250	SVLC-1764	0.200	10.0	Sorbent dry start/end:1st: 1621/1626 Buffer:SV21-825; Amm+MeOH:SV21-826(4mL); QC Water: PFAS-21-012;
WK17067-007	Sample	FT001P-DPT1-03D-GW-111621	2	PFAS by ID SOP QSMB-15	276.86	32.82	244		0.000	10.0	Bottletop#329; Pipettes:20-1288,21-1707; QC Bottles: M-1-294-01BB; GCB/WAX 500/50:21-2573;
WK18071-026	Sample	FT006P-DPT3-14D-GW-111821	2	PFAS by ID SOP QSMB-15	180.78	31.47	149		0.000	10.0	Reservoirs:21-2439; Elution tubes:21-2612; Storage bottles:21-2556;
WK20037-001	Sample	HBF-MW0081-010.0-20211117	2	PFAS by ID SOP QSMB-15	316.43	32.44	284		0.000	10.0	
WK24009-001	Sample	SBCF-P-111221	1	PFAS by ID SOP QSMB-15	318.15	32.2	286		0.000	10.0	
WK24009-001MS	MS		1	PFAS by ID SOP QSMB-15	316.53	31.98	285	SVLC-1764	0.200	10.0	
WK24009-002	Sample	SWRP-P-111221	1	PFAS by ID SOP QSMB-15	305.72	252.44	53		0.000	10.0	
WK24009-003	Sample	SCCF-P-111221	1	PFAS by ID SOP QSMB-15	323.24	31.95	291		0.000	10.0	
WK24009-004	Sample	B1914-P-111221	1	PFAS by ID SOP QSMB-15	319.02	77.37	242		0.000	10.0	
WK24009-004DU	Duplicate		1	PFAS by ID SOP QSMB-15	316.18	32.36	284		0.000	10.0	

(end of report) **Total Samples: 7**

Pace Environmental Services, LLC
Analyte Quantitation Report

SAMPLE CALC PFHxS REPORTED
RESULT 6.0 NG/L

Data File: \\Organics\LL\LCMSMS01.i\121021-DOD.b\121021056.d
Injection Date: 10-Dec-2021 20:33:42 Injection Vol: 10.0 uL
Sample Type: Client Auto Sampler: 44
Lab Sample ID: WK24009-001 Lab Prep. Batch: 24928
Client ID: SBOF-P-111221 Sample Group: WK24009
Sample Info: WK24009-001 Misc. Info:
Inst. ID: LCMSMS01.i Operator: Matthew M. Miller

Method: LCMSMS01_PFAS-ID Version: V17 16-Sep-2021 08:57:04
Calib Method: PFAS-ID Lock State: Unlocked
Quant Method: IsoDil Integrator: picker

Matrix: Aqueous
Final Conc.: Amt * DF * CF
Concentration Formula: CF = (VF/1000) * 1/VI *(1/AlsDf) = 0.0384231

((50496 * 1000) / 283251) / 1.138826 = 156.541

156.541 * 1 * 0.038423 = 6.01477 NG/L

Name	Value	Units	Description
DF	1		Dilution Factor
VF	10000	ul	Final Volume
VI	286	ml	Initial Sample Volume
AlsDf	0.91		Auto Sampler Dilution Factor

Reagent: lstds Conc. Level: Smp Vol. Added: 0.0100 ml
Reagent: Surrogates Conc. Level: Smp Vol. Added: 0.1100 ml

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags
D 46 13C4_PFBA CAS: SESI-0111													
217 > 172		1.719	1.714	0	1094258	17	>100:1			1001.00	1036.66	93.7	
8 Perfluoro-n-butanoic acid (PFBA) CAS: 375-22-4													J
212.9 > 168.9	46	1.719	1.720	0/0	87865	16	38:1			76.192	2.9275		
D 50 13C5_PFPeA CAS: SESI-0112													
267.9 > 223		2.095	2.088	0	944648	15	>100:1			1001.00	991.11	82.8	
21 Perfluoro-n-pentanoic acid (PFPeA) CAS: 2706-90-3													J
262.9 > 218.9	50	2.095	2.098	0/0	45647	11	49:1			44.827	1.7224		
D 44 13C3_PFBS CAS: SESI-0116													
302 > 80		2.147	2.151	0	305313	13	>100:1			1001.00	936.71	87	
7 Perfluoro-1-butanesulfonate (PFBS) CAS: 375-73-5													
298.9 > 80	44	2.147	2.151	0/0	43386	14	>100:1	Target = 3.76		104.92	4.0315		
298.9 > 99	44	2.147	2.151		11120	13	93:1	3.90 (1.88-5.63)					
22 Perfluoro-1-pentanesulfonic acid (PFPeS) CAS: 2706-91-4													J
349 > 80	44	2.511	2.505	0/0	9938	12	76:1	Target = 3.36		31.890	1.2253		
349 > 99	44	2.511	2.505		3164	19	44:1	3.14 (1.68-5.05)					
D 63 13C2_4:2 FTS_2 CAS: SESI-0104													
329 >81		2.440	2.434	0	347288	17	>100:1			5005.00	7037.59	114.8	
1 Fluorotelomer sulfonate 4:2 [1H,1H,2H,2H-perfluorohexane sulfonate] (4:2 FTS) CAS: 757124-72-4													U
327 > 307	63		2.434		ND								
D 49 13C5_PFHxA CAS: SESI-0113													
318 > 273		2.484	2.479	1	906253	14	>100:1			1001.00	1030.67	94	
15 Perfluoro-n-hexanoic acid (PFHxA) CAS: 307-24-4													J
313 > 269	49	2.484	2.479	1/0	35050	13	40:1	Target = 17.64		38.993	1.4982		
313 > 119	49	2.475	2.479		2993	12	22:1	11.71 (8.82-26.46)					
D 66 13C3_GenX CAS: SESI-0121													
287 > 185		2.606	2.601	0	707609	16	>100:1			5005.00	5137.55	88.1	
28 Hexafluoropropylene oxide dimer acid (GenX) CAS: 13252-13-6													U
285 > 119	66		2.594		ND								
D 47 13C4_PFHpA CAS: SESI-0114													
367 > 322		2.878	2.863	1	915434	17	>100:1			1001.00	1049.49	94.9	

Signal	Quant Std	RT (min.)	Exp RT (min.)	Δ RT (secs.)	Response	Peak Pts	S/N	Ion Ratio	Isomer Ratio	OnCol Conc ng/L	Final Conc ng/L	%Rec	Flags	
13 Perfluoro-n-heptanoic acid (PFHpA) CAS: 375-85-9													U	
363 > 319	47		2.863		ND									
D 45 13C3_PFHxS CAS: SESI-0096														
402 > 80		2.887	2.881	0	283251	16	>100:1			1001.00	1049.17	97.5		
14 Perfluorohexanesulfonate (PFHxS) CAS: 355-46-4														
399 > 80	45	2.896	2.890	1/1	50496	25	>100:1	Target = 3.46	3.54	156.70	6.0208			
399 > 99	45	2.887	2.890		13110	27	74:1	3.85 (1.73-5.20)	6.71					
29 4,8-dioxa-3H-perfluorononanoic acid (ADONA) CAS: 919005-14-4													U	
377 > 251	45		2.908		ND									
12 Perfluoro-1-heptanesulfonic acid (PFHpS) CAS: 375-92-8													U	
449 > 80	45		3.272		ND									
D 64 13C2_6:2 FTS_2 CAS: SESI-0105														
429 > 81		3.245	3.240	0	263572	21	>100:1			5005.00	6429.57	100.3		
2 Fluorotelomer sulfonate 6:2 [1H,1H,2H,2H-perfluorooctane sulfonate] (6:2 FTS) CAS: 27619-97-2													U	
427 > 407	64		3.240		ND									
D 53 13C8_PFOA CAS: SESI-0097														
421 > 376		3.271	3.266	0	875471	20	>100:1			1001.00	1067.96	92.8		
20 Perfluoro-n-octanoic acid (PFOA) CAS: 335-67-1													J	
413 > 369	53	3.271	3.266	0/0	24670	14	21:1	Target = 2.50		28.160	1.0820			M
413 > 169	53	3.271	3.266		11313	15	11:1	2.18 (1.25-3.75)						M
D 54 13C8_PFOS CAS: SESI-0098														
507 > 80		3.650	3.639	0	232324	19	>100:1			1001.00	979.87	89.2		
18 Perfluorooctanesulfonate (PFOS) CAS: 1763-23-1														
499 > 80	54	3.650	3.646	0/0	39014	35	96:1	Target = 3.95	1.33	144.28	5.5436			M
499 > 99	54	3.658	3.646		8648	41	53:1	4.51 (1.97-5.92)	2.10					
30 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) CAS: 756426-58-1													U	
531 > 351	54		3.841		ND									
16 Perfluoro-1-nonanesulfonic acid (PFNS) CAS: 68259-12-1													U	
549 > 80	54		3.979		ND									
9 Perfluoro-1-decanesulfonic acid (PFDS) CAS: 335-77-3													U	
599 > 80	54		4.280		ND									
31 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) CAS: 763051-92-9													U	
631 > 451	54		4.434		ND									
34 Perfluorododecanesulfonic acid (PFDOS) CAS: 79780-39-5													U	
699 > 80	54		4.770		ND									
D 56 13C9_PFNA CAS: SESI-0099														
472 > 427		3.650	3.646	0	856257	19	>100:1			1001.00	1024.31	87		
17 Perfluoro-n-nonanoic acid (PFNA) CAS: 375-95-1													U	
463 > 419	56		3.646		ND									
D 55 13C8_PFOSA CAS: SESI-0107														
506 > 78		3.939	3.927	0	442812	18	>100:1			1001.00	986.77	87.1		
19 Perfluoro-1-octanesulfonamide (PFOSA) CAS: 754-91-6													U	
498 > 78	55		3.927		ND									
D 51 13C6_PFDA CAS: SESI-0115														
519 > 474		3.999	3.987	0	805363	17	>100:1			1001.00	1049.92	96.1		
10 Perfluoro-n-decanoic acid (PFDA) CAS: 335-76-2													U	
513 > 469	51		3.994		ND									
D 65 13C2_8:2 FTS_2 CAS: SESI-0106														
529 > 81		3.991	3.987	0	247660	18	>100:1			5005.00	6660.96	100.2		
3 Fluorotelomer sulfonate 8:2 [1H,1H,2H,2H-perfluorodecane sulfonate] (8:2 FTS) CAS: 39108-34-4													U	
527 > 507	65		3.987		ND									
4 1H,1H,2H,2H-perfluorododecane sulfonate (10:2FTS) CAS: 120226-60-0													U	
627 > 607	65		4.575		ND									
D 58 d3-MeFOSAA CAS: SESI-0102														
573 > 419		4.150	4.146	0	1091845	17	>100:1			5005.00	5589.71	93.3		
6 N-methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA) CAS: 2355-31-9													U	
570 > 419	58		4.146		ND									
D 52 13C7_PFUdA CAS: SESI-0117														
570 > 525		4.304	4.299	0	669794	15	>100:1			1001.00	918.49	83.7		

Qualifier Codes:

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

APPENDIX I

STATISTICAL SUMMARY TABLES

TABLE 1: SUMMARY OF SOIL ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA - ALL AOPCs

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels					
								EPA Res RSL [2]	No. of Samples > Res RSL	HH ESL [3]	No. of Samples > HH ESL	Eco ESL [4]	No. of Samples > Eco ESL
PFAS with screening levels (µg/kg)													
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/28	ND	ND	--	--	1.09	0.11	23	0	--	--	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	10/28	1.80	0.190 J	AOPC1-SB03	0.59	0.39	0.33	1,900	0	--	--	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	25/28	92.0	0.460 J	AOPC6-SB01	13.10	11.73	18.66	130	0	--	--	--	--
PERFLUORONONANOIC ACID (PFNA)	15/28	2.60	0.250 J	AOPC7-SB02	0.76	0.53	0.55	19	0	--	--	--	--
PERFLUOROOCTANOIC ACID (PFOA)	25/28	120	0.260 J	AOPC1-SB04	10.59	9.48	23.68	19	3	3.8	11	84	1
PERFLUOROOCTANESULFONIC ACID (PFOS)	23/28	1,900	2.50	AOPC6-SB01	241.96	198.80	464.87	13	15	12	15	13	15
PFAS without screening levels (µg/kg)													
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/28	ND	ND	--	--	0.55	0.06	--	--	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/28	ND	ND	--	--	0.55	0.06	--	--	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/28	ND	ND	--	--	0.55	0.06	--	--	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	1/28	1.30 J	1.30 J	AOPC7-SB02	1.30	0.58	0.15	--	--	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	3/28	0.810 J	0.730 J	AOPC6-SB01	0.77	0.58	0.09	--	--	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/28	ND	ND	--	--	0.55	0.06	--	--	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	1/28	1.10 J	1.10 J	AOPC6-SB01	1.10	0.58	0.12	--	--	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/28	ND	ND	--	--	0.55	0.06	--	--	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	25/28	4.40	0.340 J	AOPC2-SB04	1.12	1.03	0.99	--	--	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	5/28	5.10	0.420 J	AOPC7-SB02	2.20	0.62	1.05	--	--	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	8/28	2.40	0.270 J	AOPC7-SB02	0.87	0.44	0.45	--	--	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	2/28	0.940	0.250 J	AOPC6-SB01	0.60	0.30	0.13	--	--	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	15/28	25.0	0.210 J	AOPC6-SB01	2.58	1.51	4.68	--	--	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	22/28	11.0	0.180 J	AOPC7-SB02	1.15	0.96	2.03	--	--	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	26/28	12.0	0.270 J	AOPC7-SB02	2.00	1.88	2.36	--	--	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	7/28	4.40	0.320 J	AOPC7-SB02	1.94	0.69	1.15	--	--	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	11/28	24.0	0.270 J	AOPC7-SB02	3.43	1.51	4.55	--	--	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	12/28	3.20	0.240 J	AOPC1-SB03	0.99	0.58	0.76	--	--	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	25/28	31.0	0.200 J	AOPC7-SB02	2.29	2.07	5.84	--	--	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	1/28	0.280 J	0.280 J	AOPC6-SB01	0.28	0.27	0.02	--	--	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	1/28	0.190 J	0.190 J	AOPC6-SB01	0.19	0.27	0.03	--	--	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	6/28	1.40	0.250 J	AOPC7-SB02	0.58	0.34	0.23	--	--	--	--	--	--

TABLE 1: SUMMARY OF SOIL ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA - ALL AOPCs (Continued)

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 HH ESL = Residential cancer risk ESLs for direct exposure, human health risk in soil (Regional Water Board 2020).

4 Eco ESL = No observed adverse effects levels (NOAEL) in significantly vegetated area ESLs for terrestrial habitat in soils (Regional Water Board 2020)

--	not available
AOPC	Area of Potential Concern
Eco	Ecological
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
HH	Human Health
J	Estimated value
ND	Non-detect
PFAS	per- and polyfluoroalkyl substances
Res	Residential
RSL	Regional Screening Level
µg/kg	Micrograms per kilogram

TABLE 1-1: SUMMARY OF SOIL ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 1

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels					
								EPA Res RSL [2]	No. of Samples > Res RSL	HH ESL [3]	No. of Samples > HH ESL	Eco ESL [4]	No. of Samples > Eco ESL
PFAS with screening levels (µg/kg)													
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/8	ND	ND	--	--	1.03	0.11	23	0	--	--	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	4/8	1.80	0.190 J	AOPC1-SB03	0.88	0.57	0.60	1,900	0	--	--	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	8/8	42.0	0.460 J	AOPC1-SB03	13.85	13.85	14.72	130	0	--	--	--	--
PERFLUORONONANOIC ACID (PFNA)	3/8	0.710 J	0.260 J	AOPC1-SB01	0.42	0.32	0.16	19	0	--	--	--	--
PERFLUOROOCTANOIC ACID (PFOA)	8/8	120	0.290 J	AOPC1-SB04	26.65	26.65	40.97	19	3	3.8	5	84	1
PERFLUOROOCTANESULFONIC ACID (PFOS)	8/8	920	2.50	AOPC1-SB03	170.34	170.34	318.53	13	5	12	5	13	5
PFAS without screening levels (µg/kg)													
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/8	ND	ND	--	--	0.52	0.06	--	--	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/8	ND	ND	--	--	0.52	0.06	--	--	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/8	ND	ND	--	--	0.52	0.06	--	--	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	0/8	ND	ND	--	--	0.52	0.06	--	--	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/8	ND	ND	--	--	0.52	0.06	--	--	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/8	ND	ND	--	--	0.52	0.06	--	--	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/8	ND	ND	--	--	0.52	0.06	--	--	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/8	ND	ND	--	--	0.52	0.06	--	--	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	7/8	1.10	0.360 J	AOPC1-SB04	0.57	0.53	0.26	--	--	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	1/8	2.50	2.50	AOPC1-SB03	2.50	0.54	0.79	--	--	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	2/8	0.810 J	0.540 J	AOPC1-SB01	0.68	0.36	0.21	--	--	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	1/8	0.250 J	0.250 J	AOPC1-SB04	0.25	0.25	0.03	--	--	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	5/8	3.80	0.210 J	AOPC1-SB03	1.25	0.88	1.22	--	--	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	8/8	1.60	0.180 J	AOPC1-SB04	0.52	0.52	0.46	--	--	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	8/8	4.00	0.270 J	AOPC1-SB03	1.97	1.97	1.41	--	--	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	2/8	3.00	0.340 J	AOPC1-SB03	1.67	0.61	0.96	--	--	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	3/8	4.70	0.270 J	AOPC1-SB03	2.12	0.96	1.56	--	--	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	4/8	3.20	0.240 J	AOPC1-SB03	1.75	1.00	1.30	--	--	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	8/8	1.90	0.430 J	AOPC1-SB04	0.90	0.90	0.46	--	--	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/8	ND	ND	--	--	0.25	0.03	--	--	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/8	ND	ND	--	--	0.25	0.03	--	--	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	1/8	0.250 J	0.250 J	AOPC1-SB01	0.25	0.26	0.03	--	--	--	--	--	--

TABLE 1-1: SUMMARY OF SOIL ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 1 (Continued)

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 HH ESL = Residential cancer risk ESLs for direct exposure, human health risk in soil (Regional Water Board 2020).

4 Eco ESL = No observed adverse effects levels (NOAEL) in significantly vegetated area ESLs for terrestrial habitat in soils (Regional Water Board 2020)

--	not available
AOPC	Area of Potential Concern
Eco	Ecological
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
HH	Human Health
J	Estimated value
ND	Non-detect
PFAS	per- and polyfluoroalkyl substances
Res	Residential
RSL	Regional Screening Level
µg/kg	Micrograms per kilogram

TABLE 1-2: SUMMARY OF SOIL ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 2

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels					
								EPA Res RSL [2]	No. of Samples > Res RSL	HH ESL [3]	No. of Samples > HH ESL	Eco ESL [4]	No. of Samples > Eco ESL
PFAS with screening levels (µg/kg)													
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/14	ND	ND	--	--	1.13	0.07	23	0	--	--	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	2/14	0.540 J	0.230 J	AOPC2-SB04	0.39	0.29	0.07	1,900	0	--	--	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	11/14	14.0	0.680 J	AOPC2-SB01,	5.31	4.23	4.95	130	0	--	--	--	--
PERFLUORONONANOIC ACID (PFNA)	7/14	1.10	0.250 J	AOPC2-SB02	0.57	0.42	0.25	19	0	--	--	--	--
PERFLUOROOCTANOIC ACID (PFOA)	11/14	7.70	0.260 J	AOPC2-SB02	3.30	2.65	2.45	19	0	3.8	4	84	0
PERFLUOROOCTANESULFONIC ACID (PFOS)	9/14	41.0	4.20 J	AOPC2-SB01	14.71	9.56	11.52	13	4	12	4	13	4
PFAS without screening levels (µg/kg)													
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/14	ND	ND	--	--	0.58	0.04	--	--	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/14	ND	ND	--	--	0.58	0.04	--	--	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/14	ND	ND	--	--	0.58	0.04	--	--	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	0/14	ND	ND	--	--	0.58	0.04	--	--	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/14	ND	ND	--	--	0.58	0.04	--	--	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/14	ND	ND	--	--	0.58	0.04	--	--	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/14	ND	ND	--	--	0.58	0.04	--	--	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/14	ND	ND	--	--	0.58	0.04	--	--	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	13/14	4.40	0.340 J	AOPC2-SB04	1.36	1.29	1.03	--	--	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/14	ND	ND	--	--	0.28	0.02	--	--	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	1/14	0.290 J	0.290 J	AOPC2-SB02	0.29	0.28	0.02	--	--	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/14	ND	ND	--	--	0.28	0.02	--	--	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	4/14	0.600 J	0.360 J	AOPC2-SB01	0.45	0.33	0.10	--	--	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	9/14	1.40	0.230 J	AOPC2-SB02	0.68	0.54	0.35	--	--	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	12/14	2.20	0.280 J	AOPC2-SB04	1.04	0.94	0.61	--	--	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/14	ND	ND	--	--	0.28	0.02	--	--	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	3/14	0.540 J	0.270 J	AOPC2-SB01	0.37	0.30	0.07	--	--	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	2/14	0.310 J	0.280 J	AOPC2-SB05	0.30	0.28	0.02	--	--	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	11/14	1.50	0.240 J	AOPC2-SB04	0.64	0.56	0.36	--	--	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/14	ND	ND	--	--	0.28	0.02	--	--	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/14	ND	ND	--	--	0.28	0.02	--	--	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/14	ND	ND	--	--	0.28	0.02	--	--	--	--	--	--

TABLE 1-2: SUMMARY OF SOIL ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 2 (Continued)

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 HH ESL = Residential cancer risk ESLs for direct exposure, human health risk in soil (Regional Water Board 2020).

4 Eco ESL = No observed adverse effects levels (NOAEL) in significantly vegetated area ESLs for terrestrial habitat in soils (Regional Water Board 2020)

--	not available
AOPC	Area of Potential Concern
Eco	Ecological
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
HH	Human Health
J	Estimated value
ND	Non-detect
PFAS	per- and polyfluoroalkyl substances
Res	Residential
RSL	Regional Screening Level
µg/kg	Micrograms per kilogram

TABLE 1-3: SUMMARY OF SOIL ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 6

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels					
								EPA Res RSL [2]	No. of Samples > Res RSL	HH ESL [3]	No. of Samples > HH ESL	Eco ESL [4]	No. of Samples > Eco ESL
PFAS with screening levels (µg/kg)													
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/2	ND	ND	--	--	1.10	0.28	23	0	--	--	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	2/2	0.360 J	0.290 J	AOPC6-SB01	0.33	0.33	0.05	1,900	0	--	--	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	2/2	92.0	12.0	AOPC6-SB01	52.00	52.00	56.57	130	0	--	--	--	--
PERFLUORONONANOIC ACID (PFNA)	1/2	0.430 J	0.430 J	AOPC6-SB01	0.43	0.32	0.15	19	0	--	--	--	--
PERFLUOROOCTANOIC ACID (PFOA)	2/2	5.10	0.450 J	AOPC6-SB01	2.78	2.78	3.29	19	0	3.8	1	84	0
PERFLUOROOCTANESULFONIC ACID (PFOS)	2/2	1,900	120	AOPC6-SB01	1010.00	1010.00	1258.65	13	2	12	2	13	2
PFAS without screening levels (µg/kg)													
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/2	ND	ND	--	--	0.54	0.16	--	--	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/2	ND	ND	--	--	0.54	0.16	--	--	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	0.54	0.16	--	--	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	0.54	0.16	--	--	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	1/2	0.810 J	0.810 J	AOPC6-SB01	0.81	0.73	0.11	--	--	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/2	ND	ND	--	--	0.54	0.16	--	--	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	1/2	1.10 J	1.10 J	AOPC6-SB01	1.10	0.88	0.32	--	--	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	0.54	0.16	--	--	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	1/2	0.580 J	0.580 J	AOPC6-SB01	0.58	0.40	0.26	--	--	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	1/2	0.420 J	0.420 J	AOPC6-SB01	0.42	0.37	0.07	--	--	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	1/2	1.20	1.20	AOPC6-SB01	1.20	0.76	0.62	--	--	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	1/2	0.940	0.940	AOPC6-SB01	0.94	0.63	0.43	--	--	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2/2	25.0	0.440 J	AOPC6-SB01	12.72	12.72	17.37	--	--	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	1/2	0.470 J	0.470 J	AOPC6-SB01	0.47	0.34	0.18	--	--	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	2/2	4.10	1.10	AOPC6-SB01	2.60	2.60	2.12	--	--	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	1/2	0.330 J	0.330 J	AOPC6-SB01	0.33	0.33	0.00	--	--	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	1/2	0.430 J	0.430 J	AOPC6-SB01	0.43	0.38	0.07	--	--	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	2/2	0.940 J	0.580 J	AOPC6-SB01	0.76	0.76	0.25	--	--	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	2/2	1.50	0.200 J	AOPC6-SB01	0.85	0.85	0.92	--	--	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	1/2	0.280 J	0.280 J	AOPC6-SB01	0.28	0.30	0.03	--	--	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	1/2	0.190 J	0.190 J	AOPC6-SB01	0.19	0.26	0.10	--	--	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	1/2	0.400 J	0.400 J	AOPC6-SB01	0.40	0.36	0.05	--	--	--	--	--	--

TABLE 1-3: SUMMARY OF SOIL ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 6 (Continued)

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 HH ESL = Residential cancer risk ESLs for direct exposure, human health risk in soil (Regional Water Board 2020).

4 Eco ESL = No observed adverse effects levels (NOAEL) in significantly vegetated area ESLs for terrestrial habitat in soils (Regional Water Board 2020)

--	not available
AOPC	Area of Potential Concern
Eco	Ecological
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
HH	Human Health
J	Estimated value
ND	Non-detect
PFAS	per- and polyfluoroalkyl substances
Res	Residential
RSL	Regional Screening Level
µg/kg	Micrograms per kilogram

TABLE 1-4: SUMMARY OF SOIL ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 7

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels					
								EPA Res RSL [2]	No. of Samples > Res RSL	HH ESL [3]	No. of Samples > HH ESL	Eco ESL [4]	No. of Samples > Eco ESL
PFAS with screening levels (µg/kg)													
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/4	ND	ND	--	--	1.11	0.13	23	0	--	--	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	2/4	0.550 J	0.410 J	AOPC7-SB02	0.48	0.37	0.14	1,900	0	--	--	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	4/4	23.0	4.80	AOPC7-SB02	13.60	13.60	9.74	130	0	--	--	--	--
PERFLUORONONANOIC ACID (PFNA)	4/4	2.60	0.390 J	AOPC7-SB02	1.43	1.43	1.05	19	0	--	--	--	--
PERFLUOROOCTANOIC ACID (PFOA)	4/4	4.20	1.10	AOPC7-SB02	2.43	2.43	1.45	19	0	3.8	1	84	0
PERFLUOROOCTANESULFONIC ACID (PFOS)	4/4	1,500	110	AOPC7-SB02	512.50	512.50	663.60	13	4	12	4	13	4
PFAS without screening levels (µg/kg)													
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/4	ND	ND	--	--	0.56	0.06	--	--	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/4	ND	ND	--	--	0.56	0.06	--	--	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/4	ND	ND	--	--	0.56	0.06	--	--	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	1/4	1.30 J	1.30 J	AOPC7-SB02	1.30	0.73	0.38	--	--	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	2/4	0.780 J	0.730 J	AOPC7-SB02	0.76	0.65	0.14	--	--	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/4	ND	ND	--	--	0.56	0.06	--	--	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/4	ND	ND	--	--	0.56	0.06	--	--	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/4	ND	ND	--	--	0.56	0.06	--	--	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	4/4	3.80	0.470 J	AOPC7-SB02	1.42	1.42	1.60	--	--	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	3/4	5.10	0.560 J	AOPC7-SB02	2.69	2.08	2.23	--	--	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	4/4	2.40	0.270 J	AOPC7-SB02	1.02	1.02	0.96	--	--	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/4	ND	ND	--	--	0.27	0.02	--	--	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	4/4	3.00	0.390 J	AOPC7-SB02	1.30	1.30	1.23	--	--	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	4/4	11.0	0.580 J	AOPC7-SB02	3.65	3.65	4.98	--	--	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	4/4	12.0	0.810 J	AOPC7-SB02	4.62	4.62	5.26	--	--	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	4/4	4.40	0.320 J	AOPC7-SB02	2.47	2.47	2.13	--	--	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	4/4	24.0	0.550 J	AOPC7-SB02	7.44	7.44	11.20	--	--	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	4/4	1.40	0.340 J	AOPC7-SB02	0.70	0.70	0.50	--	--	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	4/4	31.0	1.10	AOPC7-SB02	10.33	10.33	14.13	--	--	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/4	ND	ND	--	--	0.27	0.02	--	--	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/4	ND	ND	--	--	0.27	0.02	--	--	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	4/4	1.40	0.260 J	AOPC7-SB02	0.70	0.70	0.49	--	--	--	--	--	--

TABLE 1-4: SUMMARY OF SOIL ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 7 (Continued)

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 HH ESL = Residential cancer risk ESLs for direct exposure, human health risk in soil (Regional Water Board 2020).

4 Eco ESL = No observed adverse effects levels (NOAEL) in significantly vegetated area ESLs for terrestrial habitat in soils (Regional Water Board 2020)

--	not available
AOPC	Area of Potential Concern
Eco	Ecological
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
HH	Human Health
J	Estimated value
ND	Non-detect
PFAS	per- and polyfluoroalkyl substances
Res	Residential
RSL	Regional Screening Level
µg/kg	Micrograms per kilogram

TABLE 2: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA - ALL AOPCs

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	1/77	6.10 J	6.10 J	UST3-MW-02	6.10	7.16	25.48	6	1	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	71/79	1,500	0.870 J	WU4-19	90.96	81.84	222.85	600	3	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	75/79	10,400	1.00 J	W12-20	600.62	570.26	1532.84	39	42	--	--
PERFLUORONONANOIC ACID (PFNA)	25/79	111	0.910 J	W12-20	11.15	6.59	17.74	5.9	9	--	--
PERFLUOROOCTANOIC ACID (PFOA)	71/79	5,540	1.00 J	W12-20	155.37	139.73	627.16	6	53	5.1	53
PERFLUOROOCTANESULFONIC ACID (PFOS)	71/79	40,000	1.40 J	14D39A	1716.56	1542.83	5513.97	4	59	6.5	55
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/77	ND	ND	--	--	7.11	25.49	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/77	ND	ND	--	--	7.11	25.49	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	4/79	130	2.40 J	W5-3	37.19	8.75	28.70	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	68/79	4,600	2.00 J	W5-3	263.00	226.64	767.53	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	11/79	1,740	2.00 J	W12-20	172.70	30.55	196.46	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/77	ND	ND	--	--	7.11	25.49	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	1/79	8.30	8.30	W7-11	8.30	7.03	25.17	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/79	ND	ND	--	--	6.95	25.17	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	78/79	675	1.00 J	W12-20	58.44	57.71	116.75	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/79	ND	ND	--	--	3.47	12.36	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	14/79	13.6	1.10 J	W12-20	3.86	3.98	12.39	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	3/79	1.40 J	1.10 J	UST3-MW-02	1.27	3.48	12.36	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	38/79	720	0.890 J	14D39A	76.19	37.14	117.98	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	56/79	944	0.930 J	W12-20	65.26	46.53	132.14	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	64/79	3,590	1.00 J	W12-20	262.87	213.13	556.20	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	4/79	50.0	1.40 J	14D39A	15.80	4.22	13.41	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	12/79	128	0.930 J	W12-20	14.54	5.53	18.75	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	63/79	1,200	1.60 J	WU4-19	91.46	73.12	194.86	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	61/79	2,880	1.10 J	W12-20	169.00	130.70	398.59	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	1/79	14.0	14.0	W7-11	14.00	3.63	12.41	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	1/79	2.10 J	2.10 J	W7-11	2.10	3.48	12.36	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	2/79	2.20 J	1.20 J	WNB-14	1.70	3.48	12.36	--	--	--	--

TABLE 2: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA - ALL AOPCs (Continued)

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-1: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 1

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/7	ND	ND	--	--	16.75	32.86	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	9/9	931	7.00	W12-20	220.26	220.26	309.90	600	1	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	9/9	10,400	34.0	W12-20	2173.22	2173.22	3262.55	39	8	--	--
PERFLUORONONANOIC ACID (PFNA)	4/9	111	3.55	W12-20	38.69	23.50	36.72	5.9	2	--	--
PERFLUOROOCTANOIC ACID (PFOA)	9/9	5,540	5.10	W12-20	770.79	770.79	1794.96	6	8	5.1	8
PERFLUOROOCTANESULFONIC ACID (PFOS)	9/9	7,700	13.0	11N21A1	2337.89	2337.89	2694.65	4	9	6.5	9
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/7	ND	ND	--	--	16.75	32.86	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/7	ND	ND	--	--	16.75	32.86	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	1/9	8.05	8.05	W12-20	8.05	14.04	29.01	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	8/9	2,830	17.0	W12-20	432.10	384.29	920.93	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	4/9	1,740	4.63	W12-20	440.23	208.26	575.09	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/7	ND	ND	--	--	16.75	32.86	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/9	ND	ND	--	--	13.26	29.28	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/9	ND	ND	--	--	13.26	29.28	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	9/9	675	4.20	W12-20	136.48	136.48	215.41	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/9	ND	ND	--	--	6.75	14.59	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	3/9	13.6	1.10 J	W12-20	6.67	8.65	14.37	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/9	ND	ND	--	--	6.75	14.59	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	8/9	200	1.20 J	11N21A1	65.85	58.63	68.67	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	9/9	944	2.10 J	W12-20	184.00	184.00	311.93	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	9/9	3,590	6.00	W12-20	636.56	636.56	1148.40	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	1/9	3.90 J	3.90 J	W20-01	3.90	7.07	14.48	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	3/9	128	1.90 J	W12-20	44.47	21.25	42.49	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	9/9	886	6.10	W12-20	221.41	221.41	291.15	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	9/9	2,880	4.70	W12-20	542.92	542.92	983.44	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/9	ND	ND	--	--	6.75	14.59	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/9	ND	ND	--	--	6.75	14.59	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	1/9	1.20 J	1.20 J	W20-01	1.20	6.77	14.58	--	--	--	--

TABLE 2-1: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 1

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-2: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 2

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/5	ND	ND	--	--	1.80	0.08	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	5/5	9.50	6.40	PFAS-D	8.26	8.26	1.23	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	5/5	23.0	6.70	PFAS-C	14.08	14.08	6.91	39	0	--	--
PERFLUORONONANOIC ACID (PFNA)	1/5	1.30 J	1.30 J	PFAS-F	1.30	0.99	0.18	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	4/5	4.60	1.70 J	PFAS-C	3.13	2.69	1.69	6	0	5.1	0
PERFLUOROOCTANESULFONIC ACID (PFOS)	5/5	35.0	2.00 J	PFAS-C	11.10	11.10	13.80	4	2	6.5	2
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/5	ND	ND	--	--	1.80	0.08	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/5	ND	ND	--	--	1.80	0.08	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/5	ND	ND	--	--	1.80	0.08	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	4/5	77.0	4.50 J	PFAS-G	31.88	25.88	31.07	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/5	ND	ND	--	--	1.80	0.08	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/5	ND	ND	--	--	1.80	0.08	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/5	ND	ND	--	--	1.80	0.08	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/5	ND	ND	--	--	1.80	0.08	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	5/5	13.0	2.50 J	PFAS-D	7.98	7.98	3.80	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/5	ND	ND	--	--	0.90	0.05	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/5	ND	ND	--	--	0.90	0.05	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/5	ND	ND	--	--	0.90	0.05	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1/5	0.890 J	0.890 J	PFAS-C	0.89	0.91	0.04	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	0/5	ND	ND	--	--	0.90	0.05	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	2/5	2.70 J	1.30 J	PFAS-E	2.00	1.34	0.78	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/5	ND	ND	--	--	0.90	0.05	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/5	ND	ND	--	--	0.90	0.05	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	5/5	3.20 J	1.60 J	PFAS-E	2.34	2.34	0.62	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	2/5	1.10 J	1.10 J	PFAS-C, PFAS-E	1.10	0.98	0.12	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/5	ND	ND	--	--	0.90	0.05	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/5	ND	ND	--	--	0.90	0.05	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/5	ND	ND	--	--	0.90	0.05	--	--	--	--

TABLE 2-2: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 2

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-3: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 3

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	1/7	6.10 J	6.10 J	UST3-MW-02	6.10	2.46	1.61	6	1	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	6/7	14.0	0.870 J	W7-9	9.40	8.17	5.60	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	7/7	180	8.10	W7-9	56.59	56.59	58.48	39	4	--	--
PERFLUORONONANOIC ACID (PFNA)	2/7	11.0	1.60 J	W7-9	6.30	2.46	3.78	5.9	1	--	--
PERFLUOROOCTANOIC ACID (PFOA)	7/7	62.0	4.10	W7-9	20.24	20.24	19.53	6	5	5.1	5
PERFLUOROOCTANESULFONIC ACID (PFOS)	7/7	160	2.30 J	W7-9	54.90	54.90	50.59	4	6	6.5	6
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/7	ND	ND	--	--	1.86	0.16	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/7	ND	ND	--	--	1.86	0.16	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/7	ND	ND	--	--	1.86	0.16	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	7/7	290	2.00 J	UST3-MW-02	82.66	82.66	117.64	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/7	ND	ND	--	--	1.86	0.16	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/7	ND	ND	--	--	1.86	0.16	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	1/7	8.30	8.30	W7-11	8.30	2.76	2.45	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/7	ND	ND	--	--	1.86	0.16	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	7/7	45.0	1.40 J	W7-9	14.49	14.49	14.69	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/7	ND	ND	--	--	0.94	0.07	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	2/7	5.50	1.20 J	W7-9	3.35	1.61	1.72	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	2/7	1.40 J	1.10 J	UST3-MW-02	1.25	1.01	0.20	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	3/7	4.90	1.30 J	W7-9	2.53	1.59	1.48	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	5/7	51.0	1.40 J	W7-9	11.98	8.81	18.62	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	7/7	54.0	1.00 J	W7-9	9.57	9.57	19.63	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/7	ND	ND	--	--	0.94	0.07	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	1/7	0.930 J	0.930 J	W7-13	0.93	0.94	0.07	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	5/7	19.0	3.20 J	W7-9	8.16	6.07	6.34	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	4/7	56.0	1.20 J	W7-9	16.18	9.62	20.51	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	1/7	14.0	14.0	W7-11	14.00	2.79	4.94	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	1/7	2.10 J	2.10 J	W7-11	2.10	1.09	0.45	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/7	ND	ND	--	--	0.94	0.07	--	--	--	--

TABLE 2-3: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 3

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-4: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 4

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/2	ND	ND	--	--	1.93	0.25	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	2/2	5.80	1.20 J	W11-2	3.50	3.50	3.25	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	2/2	16.0	2.10 J	W11-2	9.05	9.05	9.83	39	0	--	--
PERFLUORONONANOIC ACID (PFNA)	0/2	ND	ND	--	--	0.95	0.14	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	2/2	110	16.0	W11-2	63.00	63.00	66.47	6	2	5.1	2
PERFLUOROOCTANESULFONIC ACID (PFOS)	2/2	3.00 J	2.30 J	W11-2	2.65	2.65	0.49	4	0	6.5	0
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/2	ND	ND	--	--	1.93	0.25	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/2	ND	ND	--	--	1.93	0.25	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	1.93	0.25	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	2/2	50.0	5.20 J	W11-2	27.60	27.60	31.68	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	1.93	0.25	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/2	ND	ND	--	--	1.93	0.25	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	1.93	0.25	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	1.93	0.25	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	2/2	48.0	5.80	W11-2	26.90	26.90	29.84	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/2	ND	ND	--	--	0.95	0.14	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/2	ND	ND	--	--	0.95	0.14	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/2	ND	ND	--	--	0.95	0.14	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0/2	ND	ND	--	--	0.95	0.14	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	2/2	7.90	1.20 J	W11-2	4.55	4.55	4.74	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	2/2	8.40	3.90	W11-2	6.15	6.15	3.18	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/2	ND	ND	--	--	0.95	0.14	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/2	ND	ND	--	--	0.95	0.14	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	0/2	ND	ND	--	--	0.95	0.14	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	2/2	7.60	3.90	W11-2	5.75	5.75	2.62	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/2	ND	ND	--	--	0.95	0.14	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/2	ND	ND	--	--	0.95	0.14	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/2	ND	ND	--	--	0.95	0.14	--	--	--	--

TABLE 2-4: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 4

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-5: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 5

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/6	ND	ND	--	--	1.85	0.07	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	6/6	1,500	11.0	WU4-19	373.17	373.17	568.98	600	1	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	6/6	4,400	24.0	WU4-19	2054.00	2054.00	1944.94	39	5	--	--
PERFLUORONONANOIC ACID (PFNA)	6/6	27.0	2.40 J	WNB-14	9.35	9.35	8.96	5.9	4	--	--
PERFLUOROOCTANOIC ACID (PFOA)	6/6	380	8.30	14D36A	194.22	194.22	148.24	6	6	5.1	6
PERFLUOROOCTANESULFONIC ACID (PFOS)	6/6	40,000	14.0	14D39A	12020.67	12020.67	16138.40	4	6	6.5	6
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/6	ND	ND	--	--	1.85	0.07	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/6	ND	ND	--	--	1.85	0.07	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	2/6	8.30	2.40 J	14D36A	5.35	3.03	2.59	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	6/6	690 J	6.20 J	14D36A	359.37	359.37	277.80	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	4/6	28.0	6.80 J	14D36A	19.95	13.90	12.09	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/6	ND	ND	--	--	1.85	0.07	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/6	ND	ND	--	--	1.85	0.07	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/6	ND	ND	--	--	1.85	0.07	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	6/6	270	9.20	14D39A	151.03	151.03	107.08	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/6	ND	ND	--	--	0.93	0.05	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	4/6	8.70	1.10 J	WNB-14	4.18	3.09	3.04	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	1/6	1.30 J	1.30 J	WNB-14	1.30	0.99	0.16	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	5/6	720	7.20	14D39A	301.44	251.36	301.85	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	6/6	230	3.00 J	WU4-19	111.00	111.00	89.98	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	6/6	1,600	7.70	14D39A	767.95	767.95	620.87	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	3/6	50.0	1.40 J	14D39A	19.77	10.34	19.62	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	4/6	23.0	2.30 J	14D39A	8.08	5.70	8.57	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	6/6	1,200	5.10	WU4-19	328.68	328.68	452.14	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	6/6	560	8.30	14D39A	299.72	299.72	232.63	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/6	ND	ND	--	--	0.93	0.05	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/6	ND	ND	--	--	0.93	0.05	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	1/6	2.20 J	2.20 J	WNB-14	2.20	1.14	0.52	--	--	--	--

TABLE 2-5: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 5

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-6: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 6

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/3	ND	ND	--	--	73.83	96.27	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	3/3	620	180	14D02A	430.00	430.00	226.05	600	1	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	3/3	5,200	970	14D02A	2590.00	2590.00	2282.17	39	3	--	--
PERFLUORONONANOIC ACID (PFNA)	1/3	14.0 J	14.0 J	WU4-18	14.00	37.67	45.39	5.9	1	--	--
PERFLUOROOCTANOIC ACID (PFOA)	3/3	610	140	14D02A	306.67	306.67	263.12	6	3	5.1	3
PERFLUOROOCTANESULFONIC ACID (PFOS)	3/3	15,000	1,000	14D02A	6433.33	6433.33	7507.55	4	3	6.5	3
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/3	ND	ND	--	--	73.83	96.27	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/3	ND	ND	--	--	73.83	96.27	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/3	ND	ND	--	--	73.83	96.27	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	3/3	680 J	35.0 J	14D02A	348.33	348.33	322.89	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	1/3	20.0 J	20.0 J	WU4-18	20.00	74.33	95.85	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/3	ND	ND	--	--	73.83	96.27	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/3	ND	ND	--	--	73.83	96.27	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/3	ND	ND	--	--	73.83	96.27	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	3/3	350 J	49.0	14D02A	183.00	183.00	153.19	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/3	ND	ND	--	--	36.17	46.62	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/3	ND	ND	--	--	36.17	46.62	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/3	ND	ND	--	--	36.17	46.62	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	3/3	500	34.0 J	14D02A	208.33	208.33	254.19	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	3/3	230 J	44.0	14D02A	134.67	134.67	93.09	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	3/3	1,700	220	14D02A	880.00	880.00	752.86	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/3	ND	ND	--	--	36.17	46.62	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/3	ND	ND	--	--	36.17	46.62	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	3/3	590	190	14D02A	376.67	376.67	201.33	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	3/3	510	56.0	14D02A	295.33	295.33	228.00	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/3	ND	ND	--	--	36.17	46.62	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/3	ND	ND	--	--	36.17	46.62	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/3	ND	ND	--	--	36.17	46.62	--	--	--	--

TABLE 2-6: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 6

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-7: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 7

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/5	ND	ND	--	--	5.10	7.21	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	5/5	180	7.10	14C60A	89.62	89.62	73.71	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	5/5	2,200	34.0	W20-01	930.80	930.80	859.16	39	4	--	--
PERFLUORONONANOIC ACID (PFNA)	2/5	36.0	4.20	W20-01	20.10	10.21	14.79	5.9	1	--	--
PERFLUOROOCTANOIC ACID (PFOA)	5/5	240	5.10	W20-01	112.62	112.62	93.35	6	4	5.1	4
PERFLUOROOCTANESULFONIC ACID (PFOS)	5/5	5,000	18.0	W20-01	1445.60	1445.60	2047.78	4	5	6.5	5
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/5	ND	ND	--	--	5.10	7.21	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/5	ND	ND	--	--	5.10	7.21	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/5	ND	ND	--	--	5.10	7.21	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	4/5	160	27.0	W20-01	78.25	62.97	63.27	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	2/5	8.40	7.90 J	UST29-MW02	8.15	7.59	6.63	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/5	ND	ND	--	--	5.10	7.21	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/5	ND	ND	--	--	5.10	7.21	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/5	ND	ND	--	--	5.10	7.21	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	5/5	200	4.20	W20-01	64.84	64.84	78.95	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/5	ND	ND	--	--	2.55	3.61	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	2/5	5.30	1.10 J	W20-01	3.20	3.45	3.62	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/5	ND	ND	--	--	2.55	3.61	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	4/5	95.0	2.40 J	W20-01	39.60	31.86	38.21	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	5/5	400	2.10 J	W20-01	100.90	100.90	168.59	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	5/5	620	6.00	W20-01	203.60	203.60	249.28	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	1/5	3.90 J	3.90 J	W20-01	3.90	3.13	3.53	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	2/5	3.50 J	1.90 J	W20-01	2.70	3.25	3.38	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	5/5	190	7.80	14C60A, W20-01	108.96	108.96	87.36	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	5/5	1,400	4.70	W20-01	317.54	317.54	606.50	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/5	ND	ND	--	--	2.55	3.61	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/5	ND	ND	--	--	2.55	3.61	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	1/5	1.20 J	1.20 J	W20-01	1.20	2.59	3.59	--	--	--	--

TABLE 2-7: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 7

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-8: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 8

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/5	ND	ND	--	--	1.75	0.04	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	1/5	6.90	6.90	W1-14	6.90	2.08	2.69	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	3/5	6.30	1.40 J	W1-14	3.03	2.17	2.32	39	0	--	--
PERFLUORONONANOIC ACID (PFNA)	0/5	ND	ND	--	--	0.88	0.03	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	2/5	110 J	6.50	W1-20	58.25	23.83	48.23	6	2	5.1	2
PERFLUOROOCTANESULFONIC ACID (PFOS)	1/5	2.80 J	2.80 J	W1-14	2.80	1.26	0.86	4	0	6.5	0
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/5	ND	ND	--	--	1.75	0.04	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/5	ND	ND	--	--	1.75	0.04	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/5	ND	ND	--	--	1.75	0.04	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	4/5	160	6.00 J	W1-19	88.75	71.35	68.06	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/5	ND	ND	--	--	1.75	0.04	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/5	ND	ND	--	--	1.75	0.04	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/5	ND	ND	--	--	1.75	0.04	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/5	ND	ND	--	--	1.75	0.04	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	5/5	10.0	1.00 J	W1-14	4.16	4.16	3.55	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/5	ND	ND	--	--	0.88	0.03	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/5	ND	ND	--	--	0.88	0.03	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/5	ND	ND	--	--	0.88	0.03	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0/5	ND	ND	--	--	0.88	0.03	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	2/5	2.80 J	2.40 J	W1-20	2.60	1.57	0.95	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	3/5	26.0	1.30 J	W1-14	14.10	8.81	11.36	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/5	ND	ND	--	--	0.88	0.03	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/5	ND	ND	--	--	0.88	0.03	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	1/5	2.40 J	2.40 J	W1-14	2.40	1.18	0.68	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	2/5	13.0	4.90	W1-14	8.95	4.11	5.27	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/5	ND	ND	--	--	0.88	0.03	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/5	ND	ND	--	--	0.88	0.03	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/5	ND	ND	--	--	0.88	0.03	--	--	--	--

TABLE 2-8: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 8

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-9: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 9

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/3	ND	ND	--	--	1.82	0.03	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	3/3	67.0	19.0	W2-16	35.67	35.67	27.15	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	3/3	500	110	W2-16	240.00	240.00	225.17	39	3	--	--
PERFLUORONONANOIC ACID (PFNA)	1/3	5.90	5.90	W2-16	5.90	2.58	2.87	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	3/3	230	32.0	W2-16	103.33	103.33	109.99	6	3	5.1	3
PERFLUOROOCTANESULFONIC ACID (PFOS)	3/3	500	9.10	W2-16	199.37	199.37	263.40	4	3	6.5	3
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/3	ND	ND	--	--	1.82	0.03	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/3	ND	ND	--	--	1.82	0.03	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/3	ND	ND	--	--	1.82	0.03	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	3/3	54.0	2.90 J	W2-16	22.17	22.17	27.77	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/3	ND	ND	--	--	1.82	0.03	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/3	ND	ND	--	--	1.82	0.03	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/3	ND	ND	--	--	1.82	0.03	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/3	ND	ND	--	--	1.82	0.03	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	3/3	46.0	22.0	W2-16	32.33	32.33	12.34	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/3	ND	ND	--	--	0.92	0.03	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/3	ND	ND	--	--	0.92	0.03	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/3	ND	ND	--	--	0.92	0.03	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2/3	15.0	2.20 J	W2-16	8.60	6.05	7.78	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	3/3	39.0	0.990 J	W2-16	15.40	15.40	20.61	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	3/3	150	2.70 J	W2-16	58.57	58.57	79.83	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/3	ND	ND	--	--	0.92	0.03	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	1/3	1.70 J	1.70 J	W2-16	1.70	1.18	0.45	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	3/3	68.0	12.0	W2-16	32.33	32.33	30.99	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	3/3	83.0	1.50 J	W2-16	40.83	40.83	40.82	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/3	ND	ND	--	--	0.92	0.03	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/3	ND	ND	--	--	0.92	0.03	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/3	ND	ND	--	--	0.92	0.03	--	--	--	--

TABLE 2-9: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 9

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-10: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 10

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/9	ND	ND	--	--	1.86	0.10	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	9/9	37.0	1.10 J	WGC2-11	15.67	15.67	14.05	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	9/9	120	2.20 J	WGC2-11	29.23	29.23	36.05	39	1	--	--
PERFLUORONONANOIC ACID (PFNA)	2/9	2.70 J	2.10 J	WGC2-10	2.40	1.26	0.67	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	8/9	41.0	1.00 J	WGC2-8	13.84	12.41	13.17	6	5	5.1	5
PERFLUOROOCTANESULFONIC ACID (PFOS)	7/9	53.0	1.40 J	WGC2-8	19.49	15.36	19.29	4	5	6.5	4
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/9	ND	ND	--	--	1.86	0.10	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/9	ND	ND	--	--	1.86	0.10	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/9	ND	ND	--	--	1.86	0.10	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	7/9	34.0 J-	4.40 J	WGC2-11	13.99	11.30	10.97	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/9	ND	ND	--	--	1.86	0.10	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/9	ND	ND	--	--	1.86	0.10	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/9	ND	ND	--	--	1.86	0.10	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/9	ND	ND	--	--	1.86	0.10	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	9/9	59.0 J+	4.10	WGC2-10	23.33	23.33	19.88	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/9	ND	ND	--	--	0.93	0.05	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	1/9	1.30 J	1.30 J	WGC2-4	1.30	0.98	0.13	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/9	ND	ND	--	--	0.93	0.05	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2/9	3.10 J	1.10 J	WGC2-8	2.10	1.20	0.72	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	6/9	16.0	0.930 J	WGC2-10	6.21	4.45	5.64	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	5/9	48.0	2.10 J	WGC2-10	18.94	10.93	16.28	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/9	ND	ND	--	--	0.93	0.05	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/9	ND	ND	--	--	0.93	0.05	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	6/9	27.0	2.70 J	WGC2-11	8.82	6.18	8.18	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	6/9	41.0	2.30 J	WGC2-10	14.23	9.80	14.15	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/9	ND	ND	--	--	0.93	0.06	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/9	ND	ND	--	--	0.93	0.05	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/9	ND	ND	--	--	0.93	0.05	--	--	--	--

TABLE 2-10: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 10

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-12: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 13

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/2	ND	ND	--	--	50.90	69.44	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	1/2	310	310	AOPC13-SW01	310.00	155.45	218.57	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	1/2	2,600	2,600	AOPC13-SW01	2600.00	1300.45	1837.84	39	1	--	--
PERFLUORONONANOIC ACID (PFNA)	0/2	ND	ND	--	--	25.45	34.72	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	1/2	330	330	AOPC13-SW01	330.00	165.45	232.71	6	1	5.1	1
PERFLUOROOCTANESULFONIC ACID (PFOS)	2/2	6,800	2.50 J	AOPC13-SW01	3401.25	3401.25	4806.56	4	1	6.5	1
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/2	ND	ND	--	--	50.90	69.44	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/2	ND	ND	--	--	50.90	69.44	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	50.90	69.44	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	1/2	4,300	4,300	AOPC13-SW01	4300.00	2150.90	3039.29	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	50.90	69.44	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/2	ND	ND	--	--	50.90	69.44	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	50.90	69.44	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	50.90	69.44	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	1/2	260	260	AOPC13-SW01	260.00	130.45	183.21	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/2	ND	ND	--	--	25.45	34.72	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/2	ND	ND	--	--	25.45	34.72	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/2	ND	ND	--	--	25.45	34.72	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1/2	180 J	180 J	AOPC13-SW01	180.00	90.45	126.64	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	1/2	160 J	160 J	AOPC13-SW01	160.00	80.45	112.50	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	1/2	1,600	1,600	AOPC13-SW01	1600.00	800.45	1130.73	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/2	ND	ND	--	--	25.45	34.72	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/2	ND	ND	--	--	25.45	34.72	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	1/2	330	330	AOPC13-SW01	330.00	165.45	232.71	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	1/2	620	620	AOPC13-SW01	620.00	310.45	437.77	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/2	ND	ND	--	--	25.45	34.72	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/2	ND	ND	--	--	25.45	34.72	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/2	ND	ND	--	--	25.45	34.72	--	--	--	--

TABLE 2-12: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 13

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-13: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 14

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/2	ND	ND	--	--	2.03	0.04	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	2/2	26.0 J	24.0 J	AOPC14-SW01	25.00	25.00	1.41	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	2/2	130 J	100 J	AOPC14-SW01	115.00	115.00	21.21	39	2	--	--
PERFLUORONONANOIC ACID (PFNA)	0/2	ND	ND	--	--	1.03	0.04	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	2/2	14.0 J	13.0 J	AOPC14-SW01	13.50	13.50	0.71	6	2	5.1	2
PERFLUOROOCTANESULFONIC ACID (PFOS)	2/2	120 J	94.0 J	AOPC14-SW01	107.00	107.00	18.38	4	2	6.5	2
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/2	ND	ND	--	--	2.03	0.04	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/2	ND	ND	--	--	2.03	0.04	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	2.03	0.04	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	1/2	2.70 J	2.70 J	AOPC14-SW01	2.70	2.38	0.46	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	2.03	0.04	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/2	ND	ND	--	--	2.03	0.04	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	2.03	0.04	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	2.03	0.04	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	2/2	10.0 J	8.20 J	AOPC14-SW01	9.10	9.10	1.27	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/2	ND	ND	--	--	1.03	0.04	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/2	ND	ND	--	--	1.03	0.04	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/2	ND	ND	--	--	1.03	0.04	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2/2	6.50 J	4.90 J	AOPC14-SW01	5.70	5.70	1.13	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	2/2	5.70 J	4.50 J	AOPC14-SW01	5.10	5.10	0.85	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	2/2	27.0 J	22.0 J	AOPC14-SW01	24.50	24.50	3.54	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/2	ND	ND	--	--	1.03	0.04	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/2	ND	ND	--	--	1.03	0.04	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	2/2	21.0 J	20.0 J	AOPC14-SW01	20.50	20.50	0.71	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	2/2	9.60 J	8.80 J	AOPC14-SW01	9.20	9.20	0.57	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/2	ND	ND	--	--	1.03	0.04	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/2	ND	ND	--	--	1.03	0.04	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/2	ND	ND	--	--	1.03	0.04	--	--	--	--

TABLE 2-13: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 14

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-14: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 15

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/2	ND	ND	--	--	1.93	0.11	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	1/2	12.0	12.0	AOPC15-SW01	12.00	6.50	7.78	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	1/2	48.0	48.0	AOPC15-SW01	48.00	24.50	33.23	39	1	--	--
PERFLUORONONANOIC ACID (PFNA)	0/2	ND	ND	--	--	0.98	0.04	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	1/2	17.0	17.0	AOPC15-SW01	17.00	9.00	11.31	6	1	5.1	1
PERFLUOROOCTANESULFONIC ACID (PFOS)	1/2	47.0	47.0	AOPC15-SW01	47.00	24.00	32.53	4	1	6.5	1
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/2	ND	ND	--	--	1.93	0.11	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/2	ND	ND	--	--	1.93	0.11	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	1.93	0.11	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	1/2	6.90 J	6.90 J	AOPC15-SW01	6.90	4.45	3.46	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	1/2	2.00 J	2.00 J	AOPC15-SW01	2.00	2.00	0.00	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/2	ND	ND	--	--	1.93	0.11	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	1.93	0.11	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	1.93	0.11	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	2/2	9.70	3.90 J	AOPC15-SW01	6.80	6.80	4.10	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/2	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/2	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/2	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1/2	1.40 J	1.40 J	AOPC15-SW01	1.40	1.20	0.28	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	1/2	6.40	6.40	AOPC15-SW01	6.40	3.70	3.82	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	1/2	20.0	20.0	AOPC15-SW01	20.00	10.50	13.44	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/2	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/2	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	1/2	8.30	8.30	AOPC15-SW01	8.30	4.65	5.16	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	1/2	19.0	19.0	AOPC15-SW01	19.00	10.00	12.73	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/2	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/2	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/2	ND	ND	--	--	0.98	0.04	--	--	--	--

TABLE 2-14: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 15

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-15: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 16

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/5	ND	ND	--	--	2.09	0.65	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	5/5	67.0	1.10 J	W2-16	21.52	21.52	28.21	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	5/5	500	4.50	W2-16	114.98	114.98	215.74	39	2	--	--
PERFLUORONONANOIC ACID (PFNA)	2/5	5.90	2.10 J	W2-16	4.00	2.29	2.08	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	5/5	230	3.70	W2-16	61.14	61.14	95.62	6	4	5.1	4
PERFLUOROOCTANESULFONIC ACID (PFOS)	4/5	500	2.40 J	W2-16	145.85	116.86	215.11	4	3	6.5	3
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/5	ND	ND	--	--	2.09	0.65	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/5	ND	ND	--	--	2.09	0.65	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/5	ND	ND	--	--	2.09	0.65	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	5/5	54.0	5.60 J	W2-16	18.78	18.78	20.39	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/5	ND	ND	--	--	2.09	0.65	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/5	ND	ND	--	--	2.09	0.65	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/5	ND	ND	--	--	2.09	0.65	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/5	ND	ND	--	--	2.09	0.65	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	5/5	46.0	4.10	W2-16	21.24	21.24	18.21	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/5	ND	ND	--	--	1.05	0.34	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	1/5	1.30 J	1.30 J	WGC2-4	1.30	1.13	0.34	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/5	ND	ND	--	--	1.05	0.34	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1/5	15.0	15.0	W2-16	15.00	3.87	6.23	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	4/5	39.0	1.10 J	W2-16	13.90	11.30	16.13	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	3/5	150	6.40 J	W2-16	61.13	37.04	64.05	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/5	ND	ND	--	--	1.05	0.34	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	1/5	1.70 J	1.70 J	W2-16	1.70	1.21	0.42	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	3/5	68.0	2.00 J	W2-16	24.80	15.24	29.53	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	4/5	83.0	2.30 J	W2-16	29.48	23.76	34.61	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/5	ND	ND	--	--	1.04	0.34	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/5	ND	ND	--	--	1.05	0.34	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/5	ND	ND	--	--	1.05	0.34	--	--	--	--

TABLE 2-15: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 16

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-16: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 17

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/5	ND	ND	--	--	1.89	0.14	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	4/5	37.0	7.70	W3-8	16.18	13.13	13.92	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	5/5	190	2.10 J	W3-8	85.02	85.02	74.51	39	4	--	--
PERFLUORONONANOIC ACID (PFNA)	2/5	1.50 J	1.40 J	W3-20	1.45	1.15	0.28	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	5/5	160	1.80 J	W3-20	55.56	55.56	61.21	6	4	5.1	4
PERFLUOROOCTANESULFONIC ACID (PFOS)	4/5	150	27.0	W3-8	78.75	63.19	60.39	4	4	6.5	4
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/5	ND	ND	--	--	1.89	0.14	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/5	ND	ND	--	--	1.89	0.14	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/5	ND	ND	--	--	1.89	0.14	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	5/5	14.0	3.50 J	W3-20	7.18	7.18	4.25	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/5	ND	ND	--	--	1.89	0.14	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/5	ND	ND	--	--	1.89	0.14	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/5	ND	ND	--	--	1.89	0.14	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/5	ND	ND	--	--	1.89	0.14	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	5/5	96.0	3.30 J	W3-8	29.06	29.06	37.86	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/5	ND	ND	--	--	0.96	0.07	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/5	ND	ND	--	--	0.96	0.07	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/5	ND	ND	--	--	0.96	0.07	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	3/5	5.70	1.10 J	W3-8	2.97	2.17	2.03	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	3/5	10.0	1.10 J	W3-20	4.33	2.99	3.94	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	4/5	12.0	1.00 J	W3-20	5.48	4.58	4.90	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/5	ND	ND	--	--	0.96	0.07	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	2/5	3.80 J	1.20 J	W3-20	2.50	1.56	1.26	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	4/5	29.0	5.00	W3-8	12.70	10.35	11.02	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	3/5	12.0	1.40 J	W3-8	6.07	4.02	4.74	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/5	ND	ND	--	--	0.96	0.07	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/5	ND	ND	--	--	0.96	0.07	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/5	ND	ND	--	--	0.96	0.07	--	--	--	--

TABLE 2-16: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 17

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-17: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 18

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/3	ND	ND	--	--	1.83	0.10	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	3/3	22.0	12.0	PFAS-A	17.33	17.33	5.03	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	3/3	220	32.0	PFAS-A	124.00	124.00	94.06	39	2	--	--
PERFLUORONONANOIC ACID (PFNA)	2/3	2.90 J	0.910 J	11E02A	1.91	1.60	1.12	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	3/3	34.0	1.60 J	11E02A	20.20	20.20	16.72	6	2	5.1	2
PERFLUOROOCTANESULFONIC ACID (PFOS)	3/3	470	55.0	11E02A	225.00	225.00	217.43	4	3	6.5	3
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/3	ND	ND	--	--	1.83	0.10	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/3	ND	ND	--	--	1.83	0.10	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/3	ND	ND	--	--	1.83	0.10	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	3/3	110	47.0	PFAS-A	71.67	71.67	33.65	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/3	ND	ND	--	--	1.83	0.10	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/3	ND	ND	--	--	1.83	0.10	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/3	ND	ND	--	--	1.83	0.10	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/3	ND	ND	--	--	1.83	0.10	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	3/3	82.0	12.0	PFAS-A	55.67	55.67	38.08	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/3	ND	ND	--	--	0.93	0.06	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/3	ND	ND	--	--	0.93	0.06	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/3	ND	ND	--	--	0.93	0.06	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	2/3	5.20	4.20	PFAS-A	4.70	3.47	2.19	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	2/3	52.0	42.0	PFAS-A	47.00	31.67	27.02	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	3/3	240	2.20 J	11E02A	140.73	140.73	123.67	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/3	ND	ND	--	--	0.93	0.06	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/3	ND	ND	--	--	0.93	0.06	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	3/3	23.0	8.30	PFAS-A	14.43	14.43	7.65	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	3/3	230	1.80 J	11E02A	140.60	140.60	121.86	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/3	ND	ND	--	--	0.93	0.06	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/3	ND	ND	--	--	0.93	0.06	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/3	ND	ND	--	--	0.93	0.06	--	--	--	--

TABLE 2-17: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 18

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-18: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 20

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/1	ND	ND	--	--	1.75	0.00	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	1/1	60.0	60.0	AOPC20-SW01	60.00	60.00	0.00	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	1/1	230	230	AOPC20-SW01	230.00	230.00	0.00	39	1	--	--
PERFLUORONONANOIC ACID (PFNA)	0/1	ND	ND	--	--	0.90	0.00	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	1/1	36.0	36.0	AOPC20-SW01	36.00	36.00	0.00	6	1	5.1	1
PERFLUOROOCTANESULFONIC ACID (PFOS)	1/1	210	210	AOPC20-SW01	210.00	210.00	0.00	4	1	6.5	1
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/1	ND	ND	--	--	1.75	0.00	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/1	ND	ND	--	--	1.75	0.00	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/1	ND	ND	--	--	1.75	0.00	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	1/1	5.30 J	5.30 J	AOPC20-SW01	5.30	5.30	0.00	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/1	ND	ND	--	--	1.75	0.00	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/1	ND	ND	--	--	1.75	0.00	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/1	ND	ND	--	--	1.75	0.00	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/1	ND	ND	--	--	1.75	0.00	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	1/1	25.0	25.0	AOPC20-SW01	25.00	25.00	0.00	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/1	ND	ND	--	--	0.90	0.00	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/1	ND	ND	--	--	0.90	0.00	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/1	ND	ND	--	--	0.90	0.00	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1/1	12.0	12.0	AOPC20-SW01	12.00	12.00	0.00	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	1/1	11.0	11.0	AOPC20-SW01	11.00	11.00	0.00	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	1/1	58.0	58.0	AOPC20-SW01	58.00	58.00	0.00	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/1	ND	ND	--	--	0.90	0.00	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/1	ND	ND	--	--	0.90	0.00	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	1/1	50.0	50.0	AOPC20-SW01	50.00	50.00	0.00	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	1/1	23.0	23.0	AOPC20-SW01	23.00	23.00	0.00	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/1	ND	ND	--	--	0.90	0.00	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/1	ND	ND	--	--	0.90	0.00	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/1	ND	ND	--	--	0.90	0.00	--	--	--	--

TABLE 2-18: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 20

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-19: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 21

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/8	ND	ND	--	--	1.92	0.08	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	7/8	31.0	2.80 J	W6-5	12.47	11.03	9.24	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	8/8	83.0	1.00 J	WSW-5	44.14	44.14	36.40	39	5	--	--
PERFLUORONONANOIC ACID (PFNA)	3/8	3.50 J	1.20 J	W4-14	2.20	1.43	0.90	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	8/8	60.0	1.80 J	W4-14	23.90	23.90	17.90	6	7	5.1	7
PERFLUOROOCTANESULFONIC ACID (PFOS)	7/8	99.0	3.50 J	WSW-5	48.41	42.48	38.38	4	6	6.5	5
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/8	ND	ND	--	--	1.92	0.08	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/8	ND	ND	--	--	1.92	0.08	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/8	ND	ND	--	--	1.92	0.08	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	8/8	60.0	3.50 J	W4-6	17.41	17.41	19.12	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/8	ND	ND	--	--	1.92	0.08	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/8	ND	ND	--	--	1.92	0.08	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/8	ND	ND	--	--	1.92	0.08	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/8	ND	ND	--	--	1.92	0.08	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	8/8	40.0	3.30 J	W4-14	17.04	17.04	10.93	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/8	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	3/8	3.90	1.70 J	W4-6	2.70	1.62	1.08	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/8	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	3/8	1.70 J	1.10 J	W6-6	1.40	1.13	0.28	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	6/8	11.0	2.60 J	W6-6	5.03	4.02	3.68	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	7/8	20.0	1.70 J	W4-14	8.84	7.86	7.12	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/8	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	2/8	1.20 J	1.20 J	WSW-5, WU5-12	1.20	1.04	0.10	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	5/8	8.90	5.00	W6-5	6.42	4.38	3.08	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	7/8	12.0	1.40 J	W4-14	5.73	5.14	4.45	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/8	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/8	ND	ND	--	--	0.98	0.04	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/8	ND	ND	--	--	0.98	0.04	--	--	--	--

TABLE 2-19: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 21

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-20: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 22

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/2	ND	ND	--	--	1.80	0.14	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	2/2	11.0	7.90	10J01A	9.45	9.45	2.19	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	2/2	56.0	38.0	10J01A	47.00	47.00	12.73	39	1	--	--
PERFLUORONONANOIC ACID (PFNA)	0/2	ND	ND	--	--	0.90	0.07	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	2/2	1.90 J	1.50 J	10J02A	1.70	1.70	0.28	6	0	5.1	0
PERFLUOROOCTANESULFONIC ACID (PFOS)	2/2	15.0	15.0	10J01A, 10J02A	15.00	15.00	0.00	4	2	6.5	2
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/2	ND	ND	--	--	1.80	0.14	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/2	ND	ND	--	--	1.80	0.14	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	1.80	0.14	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	1/2	79.0	79.0	10J02A	79.00	40.45	54.52	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	1.80	0.14	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/2	ND	ND	--	--	1.80	0.14	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	1.80	0.14	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	1.80	0.14	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	2/2	22.0	3.50	10J01A	12.75	12.75	13.08	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	2/2	4.60	4.40	10J01A	4.50	4.50	0.14	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/2	ND	ND	--	--	0.90	0.07	--	--	--	--

TABLE 2-20: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 22

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-21: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 24

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/4	ND	ND	--	--	1.98	0.16	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	4/4	40.0	5.70	W89-1	15.08	15.08	16.66	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	4/4	130	7.00	W89-1	43.25	43.25	58.35	39	1	--	--
PERFLUORONONANOIC ACID (PFNA)	0/4	ND	ND	--	--	0.98	0.09	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	3/4	11.0	2.70 J	W89-1	5.67	4.49	4.45	6	1	5.1	1
PERFLUOROOCTANESULFONIC ACID (PFOS)	4/4	57.0	3.80	W89-1	18.25	18.25	25.90	4	3	6.5	2
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/4	ND	ND	--	--	1.98	0.16	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/4	ND	ND	--	--	1.98	0.16	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/4	ND	ND	--	--	1.98	0.16	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	3/4	43.0	4.90 J	W89-1	19.17	14.85	19.03	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/4	ND	ND	--	--	1.98	0.16	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/4	ND	ND	--	--	1.98	0.16	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/4	ND	ND	--	--	1.98	0.16	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/4	ND	ND	--	--	1.98	0.16	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	4/4	12.0	1.50 J	W89-1	5.73	5.73	4.45	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/4	ND	ND	--	--	0.98	0.09	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/4	ND	ND	--	--	0.98	0.09	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/4	ND	ND	--	--	0.98	0.09	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1/4	0.940 J	0.940 J	W89-1	0.94	0.99	0.08	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	2/4	4.20	1.60 J	W89-1	2.90	1.93	1.55	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	3/4	21.0	1.50 J	W89-1	9.90	7.66	9.33	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/4	ND	ND	--	--	0.98	0.09	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/4	ND	ND	--	--	0.98	0.09	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	4/4	34.0	2.00 J	W89-1	11.28	11.28	15.27	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	4/4	13.0	1.10 J	W89-1	5.18	5.18	5.48	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/4	ND	ND	--	--	0.98	0.09	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/4	ND	ND	--	--	0.98	0.09	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/4	ND	ND	--	--	0.98	0.09	--	--	--	--

TABLE 2-21: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 24

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-22: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 25

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/2	ND	ND	--	--	1.95	0.21	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	2/2	5.70	4.40	15H12A	5.05	5.05	0.92	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	2/2	12.0	8.60	15H12A	10.30	10.30	2.40	39	0	--	--
PERFLUORONONANOIC ACID (PFNA)	0/2	ND	ND	--	--	0.98	0.11	5.9	0	--	--
PERFLUOROOCTANOIC ACID (PFOA)	2/2	2.20 J	1.20 J	15H12A	1.70	1.70	0.71	6	0	5.1	0
PERFLUOROOCTANESULFONIC ACID (PFOS)	2/2	9.00	4.30	15H12A	6.65	6.65	3.32	4	2	6.5	1
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/2	ND	ND	--	--	1.95	0.21	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/2	ND	ND	--	--	1.95	0.21	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	1.95	0.21	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	1/2	540	540	15H12A	540.00	270.90	380.56	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	0/2	ND	ND	--	--	1.95	0.21	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/2	ND	ND	--	--	1.95	0.21	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	1.95	0.21	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	1.95	0.21	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	2/2	3.30 J	2.80 J	15H12A	3.05	3.05	0.35	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/2	ND	ND	--	--	0.98	0.11	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	0/2	ND	ND	--	--	0.98	0.11	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/2	ND	ND	--	--	0.98	0.11	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	0/2	ND	ND	--	--	0.98	0.11	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	1/2	1.00 J	1.00 J	15H12A	1.00	0.95	0.07	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	2/2	2.00 J	1.60 J	15H12A	1.80	1.80	0.28	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/2	ND	ND	--	--	0.98	0.11	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/2	ND	ND	--	--	0.98	0.11	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	2/2	1.90 J	1.60 J	15H12A	1.75	1.75	0.21	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	2/2	1.80 J	1.80 J	15B10A, 15H12A	1.80	1.80	0.00	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/2	ND	ND	--	--	0.98	0.11	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/2	ND	ND	--	--	0.98	0.11	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/2	ND	ND	--	--	0.98	0.11	--	--	--	--

TABLE 2-22: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 25

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level

TABLE 2-23: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 26

PFAS Site Inspection for the Ames Research Center

Analyte	Detection Frequency	Maximum Detected Result	Minimum Detected Result	Location with Maximum Result	Average (Detected Results)	Average (All) [1]	Standard Deviation [1]	Screening Levels			
								EPA GW RSL [2]	No. of Samples > GW RSL	GW ESL [3]	No. of Samples > GW ESL
PFAS with screening levels (ng/L)											
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	0/2	ND	ND	--	--	1.88	0.04	6	0	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	2/2	43.0	9.50	W5-3	26.25	26.25	23.69	600	0	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	2/2	350	7.70	W5-3	178.85	178.85	242.04	39	1	--	--
PERFLUORONONANOIC ACID (PFNA)	1/2	16.0	16.0	W5-3	16.00	8.48	10.64	5.9	1	--	--
PERFLUOROOCTANOIC ACID (PFOA)	1/2	350	350	W5-3	350.00	175.48	246.82	6	1	5.1	1
PERFLUOROOCTANESULFONIC ACID (PFOS)	2/2	490	3.50 J	W5-3	246.75	246.75	344.01	4	1	6.5	1
PFAS without screening levels (ng/L)											
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID	0/2	ND	ND	--	--	1.88	0.04	--	--	--	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	0/2	ND	ND	--	--	1.88	0.04	--	--	--	--
4:2 FLUOROTELOMER SULFONATE	1/2	130	130	W5-3	130.00	65.93	90.62	--	--	--	--
6:2 FLUOROTELOMER SULFONATE	2/2	4,600	33.0	W5-3	2316.50	2316.50	3229.36	--	--	--	--
8:2 FLUOROTELOMER SULFONATE	1/2	37.0	37.0	W5-3	37.00	19.43	24.85	--	--	--	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID	0/2	ND	ND	--	--	1.88	0.04	--	--	--	--
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	1.88	0.04	--	--	--	--
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETIC ACID	0/2	ND	ND	--	--	1.88	0.04	--	--	--	--
PERFLUOROBUTANOIC ACID (PFBA)	2/2	580	13.0	W5-3	296.50	296.50	400.93	--	--	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	0/2	ND	ND	--	--	0.95	0.00	--	--	--	--
PERFLUORODECANOIC ACID (PFDA)	1/2	1.20 J	1.20 J	W5-3	1.20	1.08	0.18	--	--	--	--
PERFLUORODODECANOIC ACID (PFDOA)	0/2	ND	ND	--	--	0.95	0.00	--	--	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	1/2	12.0	12.0	W5-3	12.00	6.48	7.81	--	--	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	1/2	480	480	W5-3	480.00	240.48	338.74	--	--	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	1/2	1,400	1,400	W5-3	1400.00	700.48	989.28	--	--	--	--
PERFLUORONONANESULFONIC ACID (PFNS)	0/2	ND	ND	--	--	0.95	0.00	--	--	--	--
PERFLUOROOCTANE SULFONAMIDE (FOSA)	0/2	ND	ND	--	--	0.95	0.00	--	--	--	--
PERFLUOROPENTANESULFONIC ACID (PFPES)	2/2	42.0	1.60 J	W5-3	21.80	21.80	28.57	--	--	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	1/2	1,300	1,300	W5-3	1300.00	650.48	918.57	--	--	--	--
PERFLUOROTETRADECANOIC ACID (PFTEA)	0/2	ND	ND	--	--	0.95	0.00	--	--	--	--
PERFLUOROTRIDECANOIC ACID (PFTRIA)	0/2	ND	ND	--	--	0.95	0.00	--	--	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	0/2	ND	ND	--	--	0.95	0.00	--	--	--	--

TABLE 2-23: SUMMARY OF WATER ANALYTICAL RESULTS COMPARED WITH SCREENING CRITERIA FOR AOPC 26

PFAS Site Inspection for the Ames Research Center

Notes:

1 Values calculated using non-detects at 1/2 the limit of detection

2 Screening values are USEPA RSLs (May 2022) (HQ = 0.1), which includes the 6 PFAS compounds referenced in the table.

3 GW ESL = Maximum Contaminant Level (MCL), Priority Environmental Screening Levels (ESL) for direct exposure human health risk in water (Regional Water Board 2020).

--	not available
AOPC	Area of Potential Concern
EPA	U.S. Environmental Protection Agency
ESL	Environmental Screening Levels
GW	Groundwater
J	Estimated value
ND	Non-detect
ng/L	Nanograms per liter
PFAS	per- and polyfluoroalkyl substances
RSL	Regional Screening Level